Computer algebra independent integration tests

4-Trig-functions/4.3-Tangent/4.3.1.2-d-sec-^m-a+b-tan-^n

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Contents

Chapter 1

Introduction

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

The number of integrals in this report is [700]. This is test number [101].

1.1 Listing of CAS systems tested

The following systems were tested at this time.

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

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

Sympy was called directly using Python.

1.2 Results

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

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

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

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

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

System	solved	Failed
Rubi	% 100.00 (700)	% 0.00 (0)
Mathematica	% 100.00 (700)	% 0.00 (0)
Maple	% 82.86 (580)	% 17.14 (120)
Maxima	% 57.86 (405)	% 42.14 (295)
Fricas	% 64.57 (452)	% 35.43 (248)
Sympy	% 17.43 (122)	% 82.57 (578)
Giac	% 35.29 (247)	% 64.71 (453)
Mupad	% 52.71 (369)	% 47.29 (331)

Table 1.1: Percentage solved for each CAS

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

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

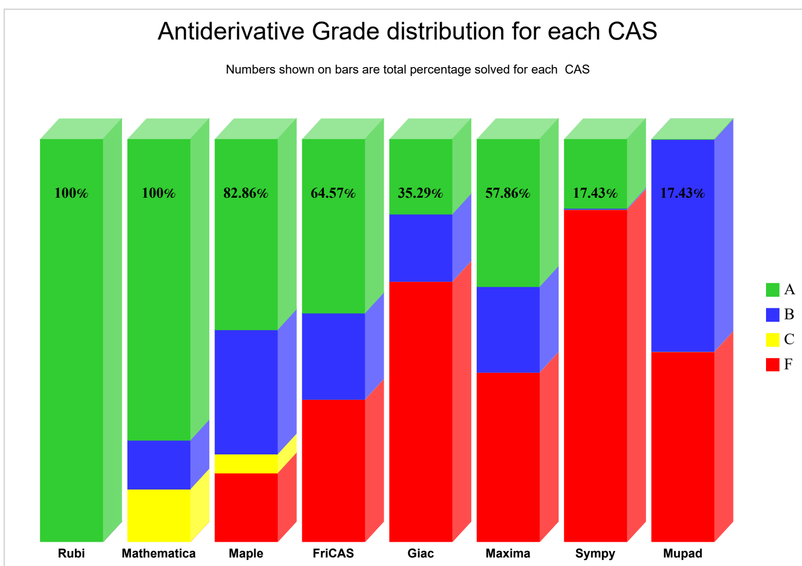
Table 1.2: Description of grading applied to integration result

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

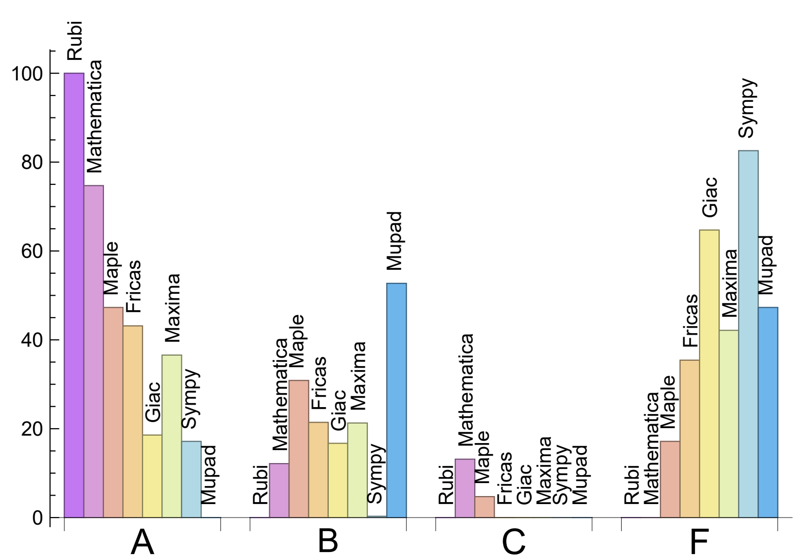
System	% A grade	% B grade	% C grade	% F grade
Rubi	100.00	0.00	0.00	0.00
Mathematica	74.71	12.14	13.14	0.00
Maple	47.29	30.86	4.71	17.14
Maxima	36.57	21.29	0.00	42.14
Fricas	43.14	21.43	0.00	35.43
Sympy	17.14	0.29	0.00	82.57
Giac	18.57	16.71	0.00	64.71
Mupad	0.00	52.71	0.00	47.29

Table 1.3: Antiderivative Grade distribution of each CAS

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



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



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

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

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

System	Number failed	Percentage normal failure	Percentage time-out failure	Percentage exception failure
Rubi	0	0.00 %	0.00 %	0.00 %
Mathematica	0	0.00 %	0.00 %	0.00 %
Maple	120	100.00 %	0.00 %	0.00 %
Maxima	295	58.98 %	9.15 %	31.86 %
Fricas	248	88.31 %	10.48 %	1.21 %
Sympy	578	70.24 %	29.41 %	0.35 %
Giac	453	94.26 %	3.53 %	2.21 %
Mupad	331	100.00 %	0.00 %	0.00 %

Table 1.4: Time and leaf size performance for each CAS

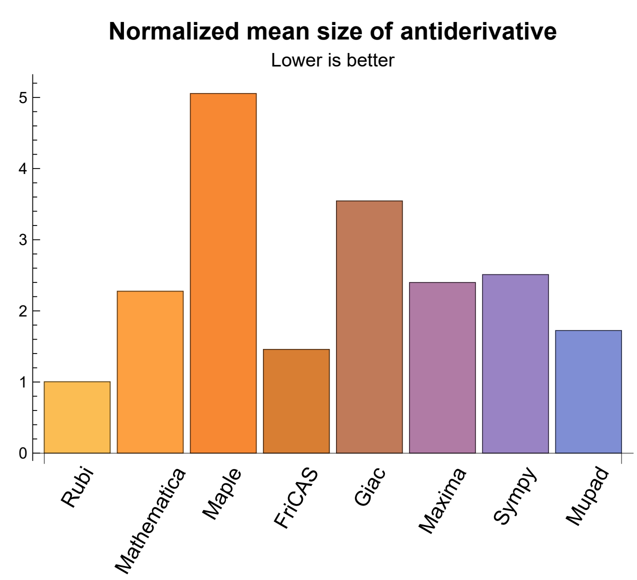
1.3 Performance

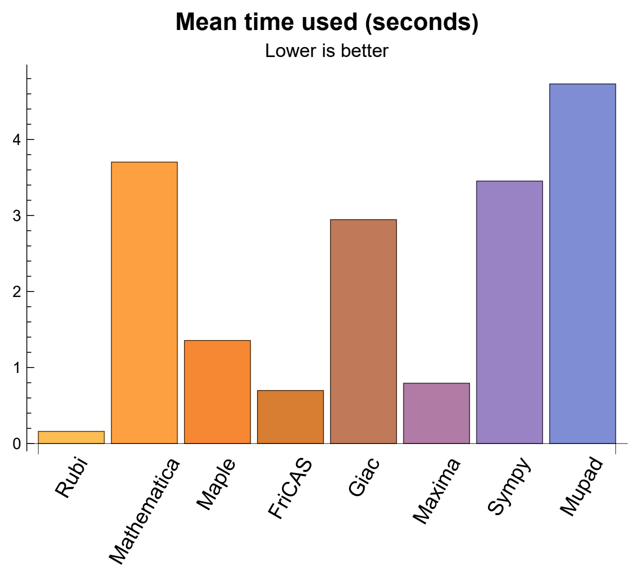
The table below summarizes the performance of each CAS system in terms of CPU time and leaf size of results.

System	Mean time (sec)	Mean size	Normalized mean	Median size	Normalized median
Rubi	0.16	144.93	1.00	110.00	1.00
Mathematica	3.70	594.39	2.28	118.00	1.03
Maple	1.36	1794.55	5.05	190.50	1.64
Maxima	0.79	371.63	2.40	134.00	1.22
Fricas	0.70	166.22	1.46	116.50	1.28
Sympy	3.45	215.19	2.51	188.00	1.58
Giac	2.94	338.15	3.55	147.00	1.72
Mupad	4.73	170.09	1.72	112.00	1.36

Table 1.5: Time and leaf size performance for each CAS

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





1.4 list of integrals that has no closed form antiderivative

{}

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

Rubi {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

Mupad {}

1.6 list of integrals solved by CAS but failed verification

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

Rubi {645}

Mathematica {92, 176, 221, 401, 403, 408, 410, 423, 431, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 626, 630, 632, 633, 634, 635, 636, 637, 638, 639, 641, 642, 643, 644, 645, 651, 652, 653, 654, 659, 688, 689, 690, 691, 692, 693, 694, 696, 697, 698, 699, 700}

Maple Verification phase not implemented yet.

Maxima Verification phase not implemented yet.

Fricas Verification phase not implemented yet.

Sympy Verification phase not implemented yet.

Giac Verification phase not implemented yet.

Mupad Verification phase not implemented yet.

1.7 Timing

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

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

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

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

1.8 Verification

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

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

1.9 Important notes about some of the results

1.9.1 Important note about Maxima results

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

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

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

Such integrals can be indentified by looking at the output of the integration in each section for Maxima. The exception message will indicate of the error is due to the interactive question being asked or not.

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

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

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

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

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

1.9.2 Important note about FriCAS and Giac/XCAS results

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

These will fail With error `Exception raised: NotImplementedError`

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

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

1.9.3 Important note about finding leaf size of antiderivative

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

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

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

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

```
try:
```

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

except Exception as ee:
       leafCount =1
```

1.9.4 Important note about Mupad results

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

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

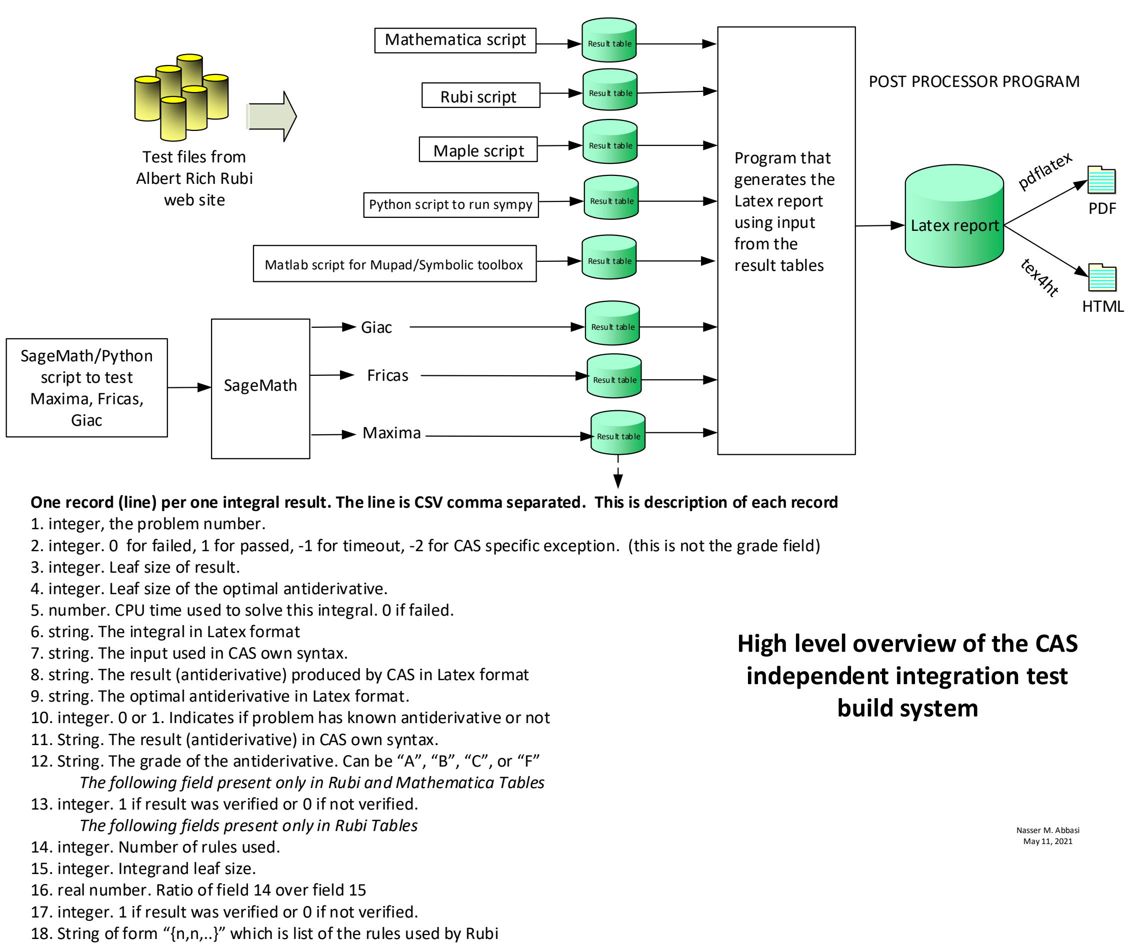
The following is an example of using Matlab's symbolic toolbox (Mupad) to solve an integral

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

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

1.10 Design of the test system

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



Chapter 2

detailed summary tables of results

2.1 List of integrals sorted by grade for each CAS

2.1.1 Rubi

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

B grade: { }

C grade: { }

F grade: { }

2.1.2 Mathematica

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 24, 25, 26, 27, 28, 32, 33, 34, 35, 36, 37, 38, 40, 42, 43, 44, 45, 46, 48, 49, 50, 51, 52, 53, 56, 57, 58, 59, 60, 63, 65, 66, 68, 69, 70, 71, 72, 73, 74, 75, 76, 81, 85, 86, 87, 89, 90, 91, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 117, 118, 119, 120, 121, 124, 126, 127, 128, 129, 130, 131, 132, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 151, 153, 155, 156, 157, 158, 161, 162, 163, 164, 165, 169, 170, 171, 173, 174, 175, 178, 179, 180, 181, 182, 183, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 263, 264, 265, 266, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 323, 324, 325, 326, 327, 328, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 402, 404, 405, 406, 407, 409, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 424, 425, 426, 427, 428, 429, 430, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 498, 500, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 521, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 540, 541, 542, 543, 544, 545, 546, 548, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 562, 563, 564, 565, 566, 567, 568, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 602, 624, 625, 626, 627, 628, 629, 630, 631, 640, 646, 647, 648, 649, 650, 655, 657, 661, 663, 665, 667, 669, 671, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695 }

B grade: { 22, 23, 29, 30, 31, 39, 41, 47, 54, 55, 61, 62, 64, 67, 77, 78, 79, 80, 82, 83, 84, 88, 92, 93, 94, 116, 122, 123, 125, 133, 149, 150, 152, 154, 159, 160, 166, 167, 168, 172, 176, 177, 267, 278, 296, 309, 322, 329, 401, 403, 408, 410, 423, 431, 450, 451, 466, 467, 468, 469, 470, 497, 499, 501, 502, 503, 520, 522, 534, 535, 536, 537, 538, 539, 549, 569, 570, 571, 573, 601, 603, 604, 635, 668, 670 }

C grade: { 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 261, 547, 560, 561, 572, 574, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 632, 633, 634, 636, 637, 638, 639, 641, 642, 643, 644, 645, 651, 652, 653, 654, 656, 658, 659, 660, 662, 664, 666, 672, 696, 697, 698, 699, 700 }

F grade: { }

2.1.3 Maple

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 40, 41, 44, 46, 47, 49, 50, 51, 53, 54, 55, 63, 71, 72, 81, 92, 99, 100, 101, 102, 103, 105, 106, 110, 111, 114, 115, 116, 117, 118, 119, 120, 121, 125, 126, 127, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 142, 143, 144, 145, 146, 148, 149, 151, 152, 153, 154, 155, 156, 157, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 177, 178, 180, 181, 182, 183, 184, 186, 190, 192, 194, 196, 198, 200, 201, 202, 204, 206, 208, 210, 212, 213, 214, 216, 218, 220, 222, 224, 226, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 279, 280, 281, 282, 286, 287, 288, 289, 293, 294, 296, 300, 301, 302, 303, 306, 309, 313, 314, 315, 319, 322, 326, 327, 328, 333, 334, 335, 336, 339, 340, 341, 342, 347, 348, 349, 350, 352, 353, 354, 355, 356, 361, 362, 363, 364, 365, 366, 368, 369, 370, 377, 378, 379, 380, 381, 382, 384, 385, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 405, 406, 407, 408, 409, 410, 411, 413, 414, 415, 416, 417, 419, 420, 421, 422, 426, 427, 428, 429, 433, 434, 435, 436, 467, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 535, 536, 540, 541, 542, 543, 544, 545, 546, 551, 552, 553, 554, 555, 556, 557, 558, 562, 563, 564, 565, 566, 567, 568, 569, 575, 576, 577, 648, 655, 657, 658, 659, 665, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 685, 686, 687 }

B grade: { 22, 24, 36, 37, 38, 39, 42, 43, 45, 48, 52, 56, 57, 58, 59, 60, 61, 62, 64, 65, 66, 67, 68, 69, 70, 73, 74, 75, 76, 77, 78, 79, 80, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 93, 94, 95, 96, 97, 98, 104, 107, 108, 109, 112, 113, 122, 123, 124, 128, 129, 140, 141, 147, 150, 158, 176, 179, 185, 187, 188, 189, 191, 193, 195, 197, 199, 203, 205, 207, 209, 211, 215, 217, 219, 221, 223, 225, 227, 228, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 261, 283, 284, 285, 290, 291, 292, 295, 297, 298, 299, 304, 305, 307, 308, 310, 311, 312, 316, 317, 318, 320, 321, 323, 324, 325, 329, 330, 331, 332, 337, 338, 343, 344, 345, 346, 351, 357, 358, 359, 360, 367, 371, 372, 373, 374, 375, 376, 383, 386, 387, 388, 389, 390, 391, 392, 404, 412, 418, 423, 424, 425, 430, 431, 432, 520, 534, 537, 538, 539, 547, 548, 549, 550, 559, 560, 561, 570, 571, 572, 573, 574, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 656, 660, 661, 662, 663, 664, 666, 684 }

C grade: { 465, 466, 483, 484, 485, 486, 487, 504, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602 }

F grade: { 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 505, 506, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 649, 650, 651, 652, 653, 654, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700 }

2.1.4 Maxima

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 47, 49, 50, 51, 52, 53, 54, 55, 57, 58, 59, 60, 62, 63, 64, 65, 68, 69, 70, 71, 72, 75, 76, 80, 81, 82, 83, 84, 89, 90, 99, 100, 101, 102, 103, 110, 114, 115, 116, 117, 118, 126, 130, 131, 132, 134, 135, 136, 143, 144, 148, 149, 151, 152, 154, 160, 161, 162, 166, 167, 168, 172, 178, 179, 180, 181, 182, 279, 280, 281, 282, 283, 284, 285, 293, 294, 295, 296, 297, 298, 299, 306, 307, 308, 309, 310, 311, 312, 319, 320, 321, 322, 323, 324, 325, 335, 336, 337, 338, 339, 347, 348, 349, 350, 351, 352, 353, 362, 363, 364, 365, 366, 367, 368, 378, 379, 380, 381, 382, 383, 384, 397, 398, 399, 405, 406, 407, 413, 414, 415, 417, 419, 420, 421, 422, 426, 427, 428, 429, 433, 434, 435, 436, 467, 483, 484, 485, 486, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 551, 552, 554, 555, 556, 557, 558, 566, 567, 568, 569, 646, 647, 648, 673, 674, 675, 681, 682, 683, 685 }

B grade: { 42, 48, 56, 61, 66, 67, 73, 74, 77, 78, 79, 85, 86, 87, 88, 91, 92, 93, 94, 95, 96, 97, 98, 107, 108, 109, 122, 123, 124, 125, 133, 140, 141, 142, 150, 153, 158, 159, 169, 170, 171, 176, 177, 288, 290, 291, 292, 300, 301, 303, 304, 315, 316, 317, 327, 328, 329, 330, 333, 334, 340, 341, 342, 343, 345, 346, 354, 355, 356, 357, 358, 360, 361, 369, 370, 371, 372, 373, 374, 376, 377, 385, 386, 387, 388, 390, 392, 393, 394, 395, 396, 400, 401, 402, 403, 404, 408, 409, 410, 411, 412, 416, 418, 423, 424, 425, 430, 431, 432, 443, 444, 445, 446, 447, 448, 449, 487, 491, 493, 495, 504, 505, 506, 549, 550, 553, 559, 560, 561, 562, 563, 564, 565, 570, 571, 572, 573, 574, 575, 576, 577, 676, 677, 678, 679, 680, 684, 686, 687 }

C grade: { }

F grade: { 104, 105, 106, 111, 112, 113, 119, 120, 121, 127, 128, 129, 137, 138, 139, 145, 146, 147, 155, 156, 157, 163, 164, 165, 173, 174, 175, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 286, 287, 289, 302, 305, 313, 314, 318, 326, 331, 332, 344, 359, 375, 389, 391, 437, 438, 439, 440, 441, 442, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 488, 489, 490, 492, 494, 496, 497, 498, 499, 500, 501, 502, 503, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700 }

2.1.5 FriCAS

A grade: { 6, 7, 8, 9, 10, 15, 16, 17, 18, 23, 24, 25, 26, 27, 31, 32, 33, 34, 35, 40, 41, 42, 43, 44, 47, 48, 49, 50, 51, 54, 55, 56, 57, 58, 63, 64, 65, 66, 68, 69, 71, 72, 73, 74, 75, 76, 81, 83, 84, 85, 86, 87, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 110, 111, 112, 113, 117, 118, 119, 120, 121, 125, 126, 127, 128, 129, 135, 136, 137, 138, 139, 142, 143, 144, 145, 146, 147, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 167, 168, 169, 170, 171, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 279, 280, 281, 284, 285, 286, 287, 288, 289, 292, 293, 299, 300, 301, 302, 303, 305, 312, 313, 314, 315, 318, 326, 327, 328, 330, 331, 332, 333, 334, 335, 336, 338, 339, 340, 341, 342, 343, 346, 347, 348, 349, 352, 353, 354, 355, 356, 361, 362, 363, 364, 365, 368, 369, 370, 376, 377, 378, 379, 380, 381, 383, 384, 392, 393, 394, 395, 397, 398, 399, 400, 401, 402, 403, 405, 406, 407, 408, 409, 410, 411, 413, 414, 415, 416, 417, 419, 420, 421, 422, 423, 424, 426, 427, 428, 429, 430, 431, 433, 434, 435, 436, 443, 444, 445, 446, 447, 448, 449, 483, 484, 485, 486, 491, 493, 505, 506, 507, 508, 509, 510, 511, 513, 514, 515, 516, 517, 518, 519, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 547, 548, 549, 553, 558, 559, 564, 565, 647, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 685, 686, 687 }

B grade: { 1, 2, 3, 4, 5, 11, 12, 13, 14, 19, 20, 21, 22, 28, 29, 30, 36, 37, 38, 39, 45, 46, 52, 53, 59, 60, 61, 62, 67, 70, 77, 78, 79, 80, 82, 88, 107, 108, 109, 114, 115, 116, 122, 123, 124, 130, 131, 132, 133, 134, 140, 141, 148, 149, 150, 166, 172, 282, 283, 290, 291, 294, 295, 296, 297, 298, 304, 306, 307, 308, 309, 310, 311, 316, 317, 319, 320, 321, 322, 323, 324, 325, 329, 337, 344, 345, 350, 351, 357, 358, 359, 360, 366, 367, 371, 372, 373, 374, 375, 382, 385, 386, 387, 388, 389, 390, 391, 396, 404, 412, 418, 425, 432, 465, 466, 467, 487, 495, 504, 512, 520, 534, 545, 546, 550, 551, 552, 554, 555, 556, 557, 560, 561, 562, 563, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 646, 648, 684 }

C grade: { }

F grade: { 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 437, 438, 439, 440, 441, 442, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 488, 489, 490, 492, 494, 496, 497, 498, 499, 500, 501, 502, 503, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700 }

2.1.6 Sympy

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 14, 15, 16, 17, 18, 23, 24, 25, 26, 27, 31, 32, 33, 34, 35, 40, 41, 42, 43, 44, 47, 48, 49, 50, 51, 54, 55, 56, 57, 58, 63, 64, 65, 66, 68, 69, 71, 72, 73, 74, 75, 76, 81, 82, 83, 84, 85, 86, 87, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 104, 105, 106, 110, 111, 112, 113, 118, 119, 120, 121, 126, 127, 128, 129, 136, 137, 138, 139, 143, 144, 145, 146, 147, 153, 154, 155, 156, 157, 161, 162, 163, 164, 165, 169, 170, 171, 172, 173, 174, 175, 179, 180, 181, 182, 183, 184, 507, 509, 511, 512 }

B grade: { 67, 88 }

C grade: { }

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

2.1.7 Giac

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 19, 20, 21, 22, 23, 24, 26, 30, 31, 36, 37, 38, 41, 45, 46, 52, 53, 59, 60, 64, 70, 99, 100, 101, 102, 105, 106, 107, 108, 109, 110, 111, 114, 115, 116, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 130, 131, 132, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 151, 153, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 167, 168, 169, 173, 174, 175, 176, 177, 178, 180, 181, 182, 183, 184, 507, 509, 511, 517, 518, 519, 531, 532, 533, 544, 545, 546, 550, 551, 552, 553, 554, 555, 556, 557, 558, 561, 562, 563, 564, 565, 566, 567, 568, 569, 576 }

B grade: { 11, 12, 13, 14, 15, 16, 17, 18, 25, 27, 28, 29, 32, 33, 34, 35, 39, 40, 42, 43, 44, 47, 48, 49, 50, 51, 54, 55, 56, 57, 58, 61, 62, 63, 65, 66, 67, 68, 69, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 103, 104, 112, 113, 117, 129, 133, 134, 135, 136, 150, 152, 154, 166, 170, 171, 172, 179, 282, 336, 508, 510, 512, 513, 514, 516, 520, 521, 523, 524, 525, 526, 527, 534, 535, 537, 538, 539, 547, 548, 549, 559, 560, 570, 571, 572, 573, 574, 575, 577 }

C grade: { }

F grade: { 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 515, 522, 528, 529, 530, 536, 540, 541, 542, 543, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700 }

2.1.8 Mupad

A grade: { }

B grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 188, 279, 280, 281, 282, 286, 287, 288, 289, 293, 294, 295, 296, 300, 301, 302, 303, 306, 307, 308, 309, 313, 314, 315, 316, 319, 320, 321, 322, 326, 327, 328, 329, 333, 334, 335, 336, 340, 341, 342, 343, 347, 348, 349, 350, 354, 355, 356, 357, 362, 363, 364, 365, 366, 369, 370, 371, 372, 378, 379, 380, 382, 385, 386, 387, 397, 398, 399, 405, 406, 407, 412, 413, 414, 415, 418, 419, 420, 421, 422, 426, 427, 428, 429, 433, 434, 435, 436, 446, 447, 448, 449, 465, 466, 467, 483, 484, 485, 486, 491, 493, 495, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 581, 648, 659, 673, 674, 675, 681, 682, 683 }

C grade: { }

F grade: { 185, 186, 187, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 283, 284, 285, 290, 291, 292, 297, 298, 299, 304, 305, 310, 311, 312, 317, 318, 323, 324, 325, 330, 331, 332, 337, 338, 339, 344, 345, 346, 351, 352, 353, 358, 359, 360, 361, 367, 368, 373, 374, 375, 376, 377, 381, 383, 384, 388, 389, 390, 391, 392, 393, 394, 395, 396, 400, 401, 402, 403, 404, 408, 409, 410, 411, 416, 417, 423, 424, 425, 430, 431, 432, 437, 438, 439, 440, 441, 442, 443, 444, 445, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 487, 488, 489, 490, 492, 494, 496, 497, 498, 499, 500, 501, 502, 503, 578, 579, 580, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 676, 677, 678, 679, 680, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700 }

2.2 Detailed conclusion table per each integral for all CAS systems

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

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

Problem 1	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	79	69	114	189	83	114	106
normalized size	1	1.00	0.84	0.73	1.21	2.01	0.88	1.21	1.13
time (sec)	N/A	0.188	0.400	0.471	0.579	0.578	11.220	0.793	3.521

Problem 2	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	63	59	92	153	68	92	149
normalized size	1	1.00	0.84	0.79	1.23	2.04	0.91	1.23	1.99
time (sec)	N/A	0.041	0.118	0.443	0.568	0.691	7.057	1.002	3.269

Problem 3	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	55	49	70	117	60	70	112
normalized size	1	1.00	0.89	0.79	1.13	1.89	0.97	1.13	1.81
time (sec)	N/A	0.037	0.130	0.439	0.480	0.480	4.615	0.674	3.241

Problem 4	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	43	39	48	81	48	48	48
normalized size	1	1.00	0.93	0.85	1.04	1.76	1.04	1.04	1.04
time (sec)	N/A	0.034	0.048	0.421	0.605	0.432	3.292	0.617	3.244

Problem 5	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	30	30	26	21	44	37	26	23
normalized size	1	1.11	1.11	0.96	0.78	1.63	1.37	0.96	0.85
time (sec)	N/A	0.031	0.014	0.388	0.460	0.397	2.360	0.758	3.209

Problem 6	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	19	19	19	23	17	18	24	18	17
normalized size	1	1.00	1.00	1.21	0.89	0.95	1.26	0.95	0.89
time (sec)	N/A	0.007	0.006	0.012	0.313	0.631	0.160	0.439	3.257

Problem 7	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	48	42	38	23	41	23	22
normalized size	1	1.00	1.07	0.93	0.84	0.51	0.91	0.51	0.49
time (sec)	N/A	0.031	0.044	0.319	0.481	0.673	0.160	0.532	3.231

Problem 8	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	46	53	61	56	139	103	64
normalized size	1	1.00	0.69	0.79	0.91	0.84	2.07	1.54	0.96
time (sec)	N/A	0.040	0.046	0.436	0.915	0.480	0.290	0.538	3.336

Problem 9	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	89	89	56	63	82	80	214	127	108
normalized size	1	1.00	0.63	0.71	0.92	0.90	2.40	1.43	1.21
time (sec)	N/A	0.052	0.063	0.438	0.850	0.482	0.410	0.763	3.568

Problem 10	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	68	73	103	104	282	151	152
normalized size	1	1.00	0.61	0.66	0.93	0.94	2.54	1.36	1.37
time (sec)	N/A	0.067	0.128	0.443	0.927	0.538	0.531	0.721	4.848

Problem 11	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	61	95	106	372	0	181	247
normalized size	1	1.00	0.62	0.97	1.08	3.80	0.00	1.85	2.52
time (sec)	N/A	0.061	0.312	0.451	0.345	0.541	0.000	2.252	7.374

Problem 12	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	70	75	86	276	0	139	178
normalized size	1	1.00	0.92	0.99	1.13	3.63	0.00	1.83	2.34
time (sec)	N/A	0.048	0.167	0.436	0.316	0.449	0.000	0.714	6.903

Problem 13	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	54	55	61	180	0	97	107
normalized size	1	1.00	1.00	1.02	1.13	3.33	0.00	1.80	1.98
time (sec)	N/A	0.035	0.016	0.422	0.448	0.593	0.000	1.424	5.130

Problem 14	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	36	32	82	41	52	39
normalized size	1	1.00	1.00	1.33	1.19	3.04	1.52	1.93	1.44
time (sec)	N/A	0.016	0.009	0.098	0.352	0.506	4.540	0.965	3.345

Problem 15	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	51	24	22	15	26	84	20
normalized size	1	1.00	1.96	0.92	0.85	0.58	1.00	3.23	0.77
time (sec)	N/A	0.021	0.023	0.276	0.379	0.709	0.140	4.051	3.280

Problem 16	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	46	37	36	42	109	196	54
normalized size	1	1.00	1.00	0.80	0.78	0.91	2.37	4.26	1.17
time (sec)	N/A	0.032	0.011	0.407	0.318	0.407	0.301	1.182	3.413

Problem 17	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	62	47	49	66	187	220	70
normalized size	1	1.00	1.00	0.76	0.79	1.06	3.02	3.55	1.13
time (sec)	N/A	0.035	0.018	0.420	0.331	0.474	0.444	1.043	4.929

Problem 18	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	76	57	58	90	257	244	93
normalized size	1	1.00	1.00	0.75	0.76	1.18	3.38	3.21	1.22
time (sec)	N/A	0.038	0.052	0.422	0.463	0.599	0.608	1.253	6.073

Problem 19	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	99	141	108	189	0	108	151
normalized size	1	1.00	0.91	1.29	0.99	1.73	0.00	0.99	1.39
time (sec)	N/A	0.066	1.428	0.444	0.563	0.486	0.000	0.997	3.263

Problem 20	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	90	113	95	151	0	95	132
normalized size	1	1.00	1.10	1.38	1.16	1.84	0.00	1.16	1.61
time (sec)	N/A	0.056	1.211	0.441	0.447	0.574	0.000	1.451	3.244

Problem 21	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	77	85	56	113	0	56	56
normalized size	1	1.00	1.40	1.55	1.02	2.05	0.00	1.02	1.02
time (sec)	N/A	0.043	0.505	0.422	0.411	0.514	0.000	0.952	3.220

Problem 22	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	68	51	21	75	0	42	35
normalized size	1	1.00	2.52	1.89	0.78	2.78	0.00	1.56	1.30
time (sec)	N/A	0.038	0.409	0.428	0.314	0.517	0.000	1.097	3.221

Problem 23	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	100	51	41	55	53	65	29
normalized size	1	1.00	2.63	1.34	1.08	1.45	1.39	1.71	0.76
time (sec)	N/A	0.017	0.775	0.016	0.789	0.640	0.238	0.567	3.230

Problem 24	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	25	25	31	73	32	17	37	17	18
normalized size	1	1.00	1.24	2.92	1.28	0.68	1.48	0.68	0.72
time (sec)	N/A	0.037	0.072	0.307	0.625	0.618	0.180	0.957	3.276

Problem 25	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	86	100	67	41	88	257	50
normalized size	1	1.00	1.37	1.59	1.06	0.65	1.40	4.08	0.79
time (sec)	N/A	0.061	0.539	0.476	0.629	0.407	0.258	1.170	3.275

Problem 26	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	117	117	116	121	92	78	187	169	88
normalized size	1	1.00	0.99	1.03	0.79	0.67	1.60	1.44	0.75
time (sec)	N/A	0.082	0.550	0.521	0.717	0.615	0.401	1.107	3.373

Problem 27	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	171	171	138	141	115	106	272	342	144
normalized size	1	1.00	0.81	0.82	0.67	0.62	1.59	2.00	0.84
time (sec)	N/A	0.107	0.588	0.545	0.488	0.561	0.533	2.031	4.027

Problem 28	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	118	159	169	181	364	0	237	290
normalized size	1	1.00	1.35	1.43	1.53	3.08	0.00	2.01	2.46
time (sec)	N/A	0.087	1.262	0.443	0.705	0.474	0.000	1.003	7.153

Problem 29	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	215	123	130	256	0	173	198
normalized size	1	1.00	2.29	1.31	1.38	2.72	0.00	1.84	2.11
time (sec)	N/A	0.077	1.292	0.437	0.564	0.654	0.000	0.789	6.783

Problem 30	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	146	79	83	148	0	107	104
normalized size	1	1.00	2.15	1.16	1.22	2.18	0.00	1.57	1.53
time (sec)	N/A	0.040	0.954	0.145	0.462	0.444	0.000	0.767	3.819

Problem 31	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	180	53	61	52	68	56	41
normalized size	1	1.00	3.91	1.15	1.33	1.13	1.48	1.22	0.89
time (sec)	N/A	0.034	0.272	0.298	0.368	0.526	0.292	1.194	3.372

Problem 32	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	51	51	50	54	52	34	76	531	78
normalized size	1	1.00	0.98	1.06	1.02	0.67	1.49	10.41	1.53
time (sec)	N/A	0.042	0.250	0.440	0.322	0.476	0.267	1.189	3.357

Problem 33	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	72	91	79	62	155	613	71
normalized size	1	1.00	1.04	1.32	1.14	0.90	2.25	8.88	1.03
time (sec)	N/A	0.049	0.524	0.524	0.437	0.580	0.423	2.023	4.175

Problem 34	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	111	111	98	90	240	641	256
normalized size	1	1.00	1.28	1.28	1.13	1.03	2.76	7.37	2.94
time (sec)	N/A	0.052	0.499	0.529	0.426	0.691	0.604	2.856	3.663

Problem 35	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	133	131	119	118	316	669	330
normalized size	1	1.00	1.27	1.25	1.13	1.12	3.01	6.37	3.14
time (sec)	N/A	0.056	1.355	0.523	0.412	0.604	0.778	2.120	5.080

Problem 36	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	117	220	108	215	0	108	151
normalized size	1	1.00	1.07	2.02	0.99	1.97	0.00	0.99	1.39
time (sec)	N/A	0.064	2.069	0.460	0.602	0.525	0.000	1.312	3.312

Problem 37	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	106	174	108	177	0	108	151
normalized size	1	1.00	1.29	2.12	1.32	2.16	0.00	1.32	1.84
time (sec)	N/A	0.056	1.570	0.445	0.377	0.402	0.000	1.417	3.286

Problem 38	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	97	128	82	139	0	82	114
normalized size	1	1.00	1.76	2.33	1.49	2.53	0.00	1.49	2.07
time (sec)	N/A	0.043	1.303	0.437	0.525	0.586	0.000	1.622	3.264

Problem 39	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	A	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	84	73	21	100	0	56	56
normalized size	1	1.00	3.11	2.70	0.78	3.70	0.00	2.07	2.07
time (sec)	N/A	0.037	0.703	0.446	0.496	0.453	0.000	1.150	3.268

Problem 40	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	119	68	76	95	94	117	41
normalized size	1	1.00	1.89	1.08	1.21	1.51	1.49	1.86	0.65
time (sec)	N/A	0.032	1.041	0.016	0.679	0.537	0.314	0.661	3.276

Problem 41	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	99	87	62	36	61	36	39
normalized size	1	1.00	2.02	1.78	1.27	0.73	1.24	0.73	0.80
time (sec)	N/A	0.049	0.381	0.321	0.571	0.628	0.321	1.942	3.291

Problem 42	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	50	114	57	34	82	135	36
normalized size	1	1.00	1.85	4.22	2.11	1.26	3.04	5.00	1.33
time (sec)	N/A	0.038	0.303	0.494	0.496	0.483	0.311	1.712	3.335

Problem 43	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	109	156	105	55	133	457	77
normalized size	1	1.00	1.21	1.73	1.17	0.61	1.48	5.08	0.86
time (sec)	N/A	0.067	0.694	0.515	0.636	0.553	0.400	2.167	3.362

Problem 44	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	144	144	131	176	128	92	230	514	125
normalized size	1	1.00	0.91	1.22	0.89	0.64	1.60	3.57	0.87
time (sec)	N/A	0.091	0.739	0.515	0.524	0.588	0.568	2.949	3.651

Problem 45	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	127	127	102	236	155	310	0	189	228
normalized size	1	1.00	0.80	1.86	1.22	2.44	0.00	1.49	1.80
time (sec)	N/A	0.120	0.854	0.533	0.750	0.609	0.000	1.080	6.983

Problem 46	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	93	167	109	202	0	125	136
normalized size	1	1.00	0.94	1.69	1.10	2.04	0.00	1.26	1.37
time (sec)	N/A	0.066	0.617	0.271	0.419	0.541	0.000	1.139	5.230

Problem 47	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	123	101	82	107	109	234	102
normalized size	1	1.00	2.02	1.66	1.34	1.75	1.79	3.84	1.67
time (sec)	N/A	0.050	0.818	0.373	0.560	0.555	0.360	3.831	3.640

Problem 48	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	31	76	75	17	37	901	66
normalized size	1	1.00	0.97	2.38	2.34	0.53	1.16	28.16	2.06
time (sec)	N/A	0.037	0.093	0.460	0.488	0.460	0.242	3.990	3.331

Problem 49	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	55	126	105	48	117	929	130
normalized size	1	1.00	0.62	1.43	1.19	0.55	1.33	10.56	1.48
time (sec)	N/A	0.071	0.607	0.512	0.681	0.436	0.405	4.784	3.568

Problem 50	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	77	146	123	76	194	465	134
normalized size	1	1.00	0.73	1.38	1.16	0.72	1.83	4.39	1.26
time (sec)	N/A	0.076	0.730	0.510	0.395	0.789	0.579	3.741	4.544

Problem 51	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	116	166	145	104	279	1039	330
normalized size	1	1.00	0.94	1.34	1.17	0.84	2.25	8.38	2.66
time (sec)	N/A	0.084	0.847	0.536	0.529	0.503	0.777	3.918	4.676

Problem 52	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	163	163	171	324	246	364	0	237	290
normalized size	1	1.00	1.05	1.99	1.51	2.23	0.00	1.45	1.78
time (sec)	N/A	0.162	2.090	0.518	0.510	0.670	0.000	1.315	7.163

Problem 53	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	237	231	180	256	0	173	198
normalized size	1	1.00	1.78	1.74	1.35	1.92	0.00	1.30	1.49
time (sec)	N/A	0.096	1.481	0.268	0.473	0.574	0.000	1.622	6.774

Problem 54	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	906	141	137	162	153	372	159
normalized size	1	1.00	9.34	1.45	1.41	1.67	1.58	3.84	1.64
time (sec)	N/A	0.074	6.652	0.401	0.451	1.286	0.437	3.623	5.300

Problem 55	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	246	130	121	68	110	1299	88
normalized size	1	1.00	3.15	1.67	1.55	0.87	1.41	16.65	1.13
time (sec)	N/A	0.076	0.667	0.454	0.420	0.585	0.448	3.388	3.563

Problem 56	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	50	139	118	34	82	915	130
normalized size	1	1.00	0.76	2.11	1.79	0.52	1.24	13.86	1.97
time (sec)	N/A	0.074	0.407	0.510	0.401	0.625	0.419	4.033	3.547

Problem 57	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	73	203	149	62	158	1327	186
normalized size	1	1.00	0.72	1.99	1.46	0.61	1.55	13.01	1.82
time (sec)	N/A	0.089	0.853	0.588	0.648	0.718	0.558	4.412	4.266

Problem 58	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	120	111	233	181	90	230	1409	145
normalized size	1	1.00	0.92	1.94	1.51	0.75	1.92	11.74	1.21
time (sec)	N/A	0.101	0.866	0.621	0.491	0.580	0.754	5.141	4.693

Problem 59	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	167	377	160	267	0	160	146
normalized size	1	1.00	1.53	3.46	1.47	2.45	0.00	1.47	1.34
time (sec)	N/A	0.073	3.881	0.502	0.456	0.885	0.000	2.584	3.708

Problem 60	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	154	295	108	229	0	108	151
normalized size	1	1.00	1.88	3.60	1.32	2.79	0.00	1.32	1.84
time (sec)	N/A	0.057	2.836	0.523	0.500	0.554	0.000	2.227	3.326

Problem 61	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	143	213	108	191	0	108	151
normalized size	1	1.00	2.60	3.87	1.96	3.47	0.00	1.96	2.75
time (sec)	N/A	0.043	2.092	0.447	0.350	0.469	0.000	2.446	3.295

Problem 62	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	A	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	134	115	21	153	0	82	114
normalized size	1	1.00	4.96	4.26	0.78	5.67	0.00	3.04	4.22
time (sec)	N/A	0.036	1.913	0.442	0.415	0.581	0.000	1.925	3.258

Problem 63	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	117	117	228	101	165	176	182	222	73
normalized size	1	1.00	1.95	0.86	1.41	1.50	1.56	1.90	0.62
time (sec)	N/A	0.066	2.873	0.016	0.671	0.620	0.477	0.773	3.272

Problem 64	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	649	175	86	123	134	145	70
normalized size	1	1.00	7.82	2.11	1.04	1.48	1.61	1.75	0.84
time (sec)	N/A	0.059	6.843	0.421	0.676	0.499	0.468	2.600	3.302

Problem 65	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	110	146	88	51	104	450	64
normalized size	1	1.00	1.51	2.00	1.21	0.70	1.42	6.16	0.88
time (sec)	N/A	0.055	0.775	0.473	0.573	0.588	0.476	3.474	3.312

Problem 66	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	50	231	93	34	82	187	53
normalized size	1	1.00	0.91	4.20	1.69	0.62	1.49	3.40	0.96
time (sec)	N/A	0.049	0.562	0.523	0.932	0.902	0.484	3.513	3.281

Problem 67	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	73	301	103	62	163	267	63
normalized size	1	1.00	2.70	11.15	3.81	2.30	6.04	9.89	2.33
time (sec)	N/A	0.038	1.114	0.602	0.729	0.597	0.620	4.716	3.301

Problem 68	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	144	144	137	331	164	83	211	857	122
normalized size	1	1.00	0.95	2.30	1.14	0.58	1.47	5.95	0.85
time (sec)	N/A	0.086	1.249	0.625	0.651	0.743	0.734	6.403	3.637

Problem 69	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	198	198	159	361	187	120	304	914	171
normalized size	1	1.00	0.80	1.82	0.94	0.61	1.54	4.62	0.86
time (sec)	N/A	0.114	3.131	0.627	0.539	0.621	0.940	7.736	4.905

Problem 70	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	167	167	115	329	215	310	0	189	228
normalized size	1	1.00	0.69	1.97	1.29	1.86	0.00	1.13	1.37
time (sec)	N/A	0.126	1.276	0.338	0.757	0.516	0.000	2.089	7.043

Problem 71	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	130	130	151	214	173	216	201	510	222
normalized size	1	1.00	1.16	1.65	1.33	1.66	1.55	3.92	1.71
time (sec)	N/A	0.104	1.695	0.475	0.638	0.626	0.539	3.486	7.135

Problem 72	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	130	179	154	122	151	1683	162
normalized size	1	1.00	1.33	1.83	1.57	1.24	1.54	17.17	1.65
time (sec)	N/A	0.089	1.877	0.530	0.751	0.493	0.536	3.226	5.431

Problem 73	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	31	170	152	17	37	1669	104
normalized size	1	1.00	0.97	5.31	4.75	0.53	1.16	52.16	3.25
time (sec)	N/A	0.036	0.164	0.540	0.395	0.422	0.386	6.630	3.448

Problem 74	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	55	257	187	48	122	1697	186
normalized size	1	1.00	0.54	2.54	1.85	0.48	1.21	16.80	1.84
time (sec)	N/A	0.114	0.995	0.596	0.369	0.538	0.615	6.694	4.215

Problem 75	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	141	141	94	287	217	76	194	1725	79
normalized size	1	1.00	0.67	2.04	1.54	0.54	1.38	12.23	0.56
time (sec)	N/A	0.122	0.978	0.540	0.552	0.571	0.770	6.275	3.937

Problem 76	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	159	159	118	317	246	104	269	1807	139
normalized size	1	1.00	0.74	1.99	1.55	0.65	1.69	11.36	0.87
time (sec)	N/A	0.126	1.428	0.605	0.480	0.481	0.979	6.905	4.605

Problem 77	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	245	611	186	345	0	186	153
normalized size	1	1.00	2.25	5.61	1.71	3.17	0.00	1.71	1.40
time (sec)	N/A	0.081	9.501	0.551	0.321	0.661	0.000	5.276	4.828

Problem 78	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	234	475	173	307	0	173	190
normalized size	1	1.00	2.85	5.79	2.11	3.74	0.00	2.11	2.32
time (sec)	N/A	0.071	7.044	0.530	0.400	0.469	0.000	4.334	5.344

Problem 79	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	223	339	134	269	0	134	107
normalized size	1	1.00	4.05	6.16	2.44	4.89	0.00	2.44	1.95
time (sec)	N/A	0.045	4.942	0.509	0.333	0.443	0.000	3.563	4.223

Problem 80	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	A	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	212	180	21	231	0	120	83
normalized size	1	1.00	7.85	6.67	0.78	8.56	0.00	4.44	3.07
time (sec)	N/A	0.038	3.650	0.483	0.507	0.498	0.000	4.215	3.828

Problem 81	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	200	200	383	150	121	296	301	378	113
normalized size	1	1.00	1.92	0.75	0.60	1.48	1.50	1.89	0.56
time (sec)	N/A	0.139	4.991	0.017	0.646	0.564	0.816	1.316	3.402

Problem 82	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	A	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	321	406	124	244	257	302	102
normalized size	1	1.00	2.41	3.05	0.93	1.83	1.93	2.27	0.77
time (sec)	N/A	0.082	7.007	0.594	0.712	0.583	0.777	5.528	3.354

Problem 83	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	566	306	136	178	216	785	111
normalized size	1	1.00	4.56	2.47	1.10	1.44	1.74	6.33	0.90
time (sec)	N/A	0.077	2.720	0.647	0.641	0.616	0.788	7.986	3.375

Problem 84	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	114	114	414	319	146	112	177	799	103
normalized size	1	1.00	3.63	2.80	1.28	0.98	1.55	7.01	0.90
time (sec)	N/A	0.071	2.709	0.622	0.698	0.621	0.842	7.481	3.405

Problem 85	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	31	451	137	17	37	381	66
normalized size	1	1.00	0.72	10.49	3.19	0.40	0.86	8.86	1.53
time (sec)	N/A	0.042	0.329	0.623	0.765	0.560	0.736	11.979	3.482

Problem 86	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	55	588	152	48	122	409	82
normalized size	1	1.00	0.69	7.35	1.90	0.60	1.52	5.11	1.02
time (sec)	N/A	0.056	1.455	0.692	0.838	0.678	0.997	13.551	3.482

Problem 87	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	77	639	162	76	199	437	82
normalized size	1	1.00	1.40	11.62	2.95	1.38	3.62	7.95	1.49
time (sec)	N/A	0.048	1.468	0.758	0.900	0.702	1.176	15.232	3.396

Problem 88	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	B	B	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	116	689	172	104	280	465	105
normalized size	1	1.00	4.30	25.52	6.37	3.85	10.37	17.22	3.89
time (sec)	N/A	0.038	2.015	0.773	0.671	0.637	1.379	17.002	3.380

Problem 89	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	225	225	166	739	246	125	325	1457	195
normalized size	1	1.00	0.74	3.28	1.09	0.56	1.44	6.48	0.87
time (sec)	N/A	0.115	6.767	0.773	0.457	0.644	1.534	18.053	4.849

Problem 90	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	279	279	188	789	269	162	415	1514	231
normalized size	1	1.00	0.67	2.83	0.96	0.58	1.49	5.43	0.83
time (sec)	N/A	0.156	7.974	0.778	0.509	0.708	1.800	23.629	5.225

Problem 91	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	235	235	205	464	396	378	320	924	399
normalized size	1	1.00	0.87	1.97	1.69	1.61	1.36	3.93	1.70
time (sec)	N/A	0.204	3.377	0.541	0.494	0.679	0.936	5.356	8.298

Problem 92	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	B	A	A	B	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	205	205	1540	356	352	284	282	2835	343
normalized size	1	1.00	7.51	1.74	1.72	1.39	1.38	13.83	1.67
time (sec)	N/A	0.193	7.450	0.598	0.460	0.684	0.910	7.398	7.818

Problem 93	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	173	173	1162	322	326	190	238	2849	281
normalized size	1	1.00	6.72	1.86	1.88	1.10	1.38	16.47	1.62
time (sec)	N/A	0.167	7.491	0.617	0.493	0.703	0.925	9.398	7.389

Problem 94	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	305	385	309	96	189	2863	207
normalized size	1	1.00	2.01	2.53	2.03	0.63	1.24	18.84	1.36
time (sec)	N/A	0.160	2.467	0.610	0.362	0.676	1.014	12.318	6.694

Problem 95	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	50	447	302	34	82	2451	37
normalized size	1	1.00	0.76	6.77	4.58	0.52	1.24	37.14	0.56
time (sec)	N/A	0.074	0.756	0.691	0.482	0.504	0.975	15.789	3.622

Problem 96	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	73	567	355	62	163	2863	65
normalized size	1	1.00	0.54	4.17	2.61	0.46	1.20	21.05	0.48
time (sec)	N/A	0.156	1.682	0.735	0.379	0.566	1.181	16.291	3.802

Problem 97	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	211	211	111	617	405	90	241	2891	93
normalized size	1	1.00	0.53	2.92	1.92	0.43	1.14	13.70	0.44
time (sec)	N/A	0.254	1.652	0.727	0.418	0.568	1.398	18.196	4.080

Problem 98	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	212	212	133	667	453	118	314	2919	222
normalized size	1	1.00	0.63	3.15	2.14	0.56	1.48	13.77	1.05
time (sec)	N/A	0.197	4.180	0.747	0.511	0.547	1.630	18.209	5.259

Problem 99	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	71	87	87	146	0	87	92
normalized size	1	1.00	0.66	0.81	0.81	1.36	0.00	0.81	0.86
time (sec)	N/A	0.070	0.491	0.387	0.424	0.632	0.000	0.692	3.530

Problem 100	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	60	68	67	109	0	67	114
normalized size	1	1.00	0.75	0.85	0.84	1.36	0.00	0.84	1.42
time (sec)	N/A	0.062	0.375	0.345	0.388	0.449	0.000	0.684	3.320

Problem 101	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	49	47	47	72	0	47	77
normalized size	1	1.00	0.89	0.85	0.85	1.31	0.00	0.85	1.40
time (sec)	N/A	0.051	0.214	0.379	0.547	0.587	0.000	0.561	3.342

Problem 102	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	34	34	35	26	27	33	0	27	25
normalized size	1	1.00	1.03	0.76	0.79	0.97	0.00	0.79	0.74
time (sec)	N/A	0.043	0.211	0.347	0.313	0.543	0.000	1.417	3.331

Problem 103	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	23	23	31	23	20	26	0	57	19
normalized size	1	1.00	1.35	1.00	0.87	1.13	0.00	2.48	0.83
time (sec)	N/A	0.041	0.116	0.259	0.326	0.443	0.000	2.266	3.354

Problem 104	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	45	59	0	32	61	60	29
normalized size	1	1.00	1.36	1.79	0.00	0.97	1.85	1.82	0.88
time (sec)	N/A	0.012	0.114	0.107	0.000	0.563	0.153	0.401	3.363

Problem 105	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	78	98	0	54	155	99	60
normalized size	1	1.00	0.95	1.20	0.00	0.66	1.89	1.21	0.73
time (sec)	N/A	0.068	0.278	0.419	0.000	0.440	0.302	0.893	3.445

Problem 106	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	109	137	0	76	223	116	123
normalized size	1	1.00	0.81	1.02	0.00	0.57	1.66	0.87	0.92
time (sec)	N/A	0.087	0.251	0.420	0.000	0.544	0.426	2.222	3.722

Problem 107	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	60	430	289	266	0	138	193
normalized size	1	1.00	0.71	5.12	3.44	3.17	0.00	1.64	2.30
time (sec)	N/A	0.077	0.405	0.357	0.509	0.641	0.000	0.720	7.005

Problem 108	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	60	60	50	258	186	174	0	99	116
normalized size	1	1.00	0.83	4.30	3.10	2.90	0.00	1.65	1.93
time (sec)	N/A	0.054	0.249	0.357	0.370	0.448	0.000	0.734	5.377

Problem 109	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	34	85	83	80	0	58	43
normalized size	1	1.00	1.10	2.74	2.68	2.58	0.00	1.87	1.39
time (sec)	N/A	0.044	0.170	0.352	0.474	0.531	0.000	0.701	3.441

Problem 110	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	25	23	29	17	34	21	25
normalized size	1	1.00	0.89	0.82	1.04	0.61	1.21	0.75	0.89
time (sec)	N/A	0.023	0.030	0.198	0.710	0.571	0.644	0.702	3.351

Problem 111	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	50	75	0	41	129	67	78
normalized size	1	1.00	1.06	1.60	0.00	0.87	2.74	1.43	1.66
time (sec)	N/A	0.037	0.131	0.443	0.000	0.523	0.295	0.654	3.549

Problem 112	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	72	141	0	63	199	119	134
normalized size	1	1.00	1.07	2.10	0.00	0.94	2.97	1.78	2.00
time (sec)	N/A	0.052	0.185	0.420	0.000	0.469	0.466	0.645	4.789

Problem 113	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	94	207	0	85	267	171	188
normalized size	1	1.00	1.11	2.44	0.00	1.00	3.14	2.01	2.21
time (sec)	N/A	0.055	0.225	0.468	0.000	0.563	0.636	0.708	7.097

Problem 114	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	90	78	77	138	0	77	93
normalized size	1	1.00	1.10	0.95	0.94	1.68	0.00	0.94	1.13
time (sec)	N/A	0.063	0.550	0.414	0.373	0.502	0.000	1.031	3.461

Problem 115	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	77	47	47	97	0	47	77
normalized size	1	1.00	1.40	0.85	0.85	1.76	0.00	0.85	1.40
time (sec)	N/A	0.051	0.419	0.348	0.317	0.411	0.000	0.854	3.360

Problem 116	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	68	36	35	54	0	35	33
normalized size	1	1.00	2.52	1.33	1.30	2.00	0.00	1.30	1.22
time (sec)	N/A	0.044	0.245	0.361	0.382	0.447	0.000	0.994	3.341

Problem 117	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	71	35	32	68	0	100	28
normalized size	1	1.00	1.87	0.92	0.84	1.79	0.00	2.63	0.74
time (sec)	N/A	0.049	0.439	0.360	0.322	0.500	0.000	0.981	3.350

Problem 118	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	32	24	21	17	65	30	22
normalized size	1	1.00	1.23	0.92	0.81	0.65	2.50	1.15	0.85
time (sec)	N/A	0.043	0.055	0.267	0.324	0.497	1.182	0.846	3.335

Problem 119	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	68	79	0	43	119	72	39
normalized size	1	1.00	1.11	1.30	0.00	0.70	1.95	1.18	0.64
time (sec)	N/A	0.029	0.218	0.105	0.000	0.532	0.230	0.538	3.401

Problem 120	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	114	114	95	117	0	65	190	103	71
normalized size	1	1.00	0.83	1.03	0.00	0.57	1.67	0.90	0.62
time (sec)	N/A	0.081	0.300	0.435	0.000	0.496	0.387	0.936	3.467

Problem 121	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	165	165	120	157	0	87	260	127	149
normalized size	1	1.00	0.73	0.95	0.00	0.53	1.58	0.77	0.90
time (sec)	N/A	0.103	0.343	0.434	0.000	0.536	0.507	0.932	4.183

Problem 122	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	294	514	421	326	0	203	191
normalized size	1	1.00	2.37	4.15	3.40	2.63	0.00	1.64	1.54
time (sec)	N/A	0.081	2.145	0.384	0.362	0.672	0.000	1.116	6.309

Problem 123	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	215	342	295	230	0	151	136
normalized size	1	1.00	2.15	3.42	2.95	2.30	0.00	1.51	1.36
time (sec)	N/A	0.068	1.112	0.385	0.386	0.545	0.000	0.948	5.924

Problem 124	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	146	170	167	134	0	95	104
normalized size	1	1.00	1.97	2.30	2.26	1.81	0.00	1.28	1.41
time (sec)	N/A	0.058	0.472	0.367	0.607	0.570	0.000	0.902	3.927

Problem 125	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	48	48	184	63	117	64	0	57	44
normalized size	1	1.00	3.83	1.31	2.44	1.33	0.00	1.19	0.92
time (sec)	N/A	0.047	0.209	0.414	0.638	0.585	0.000	1.029	3.498

Problem 126	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	38	57	45	30	112	47	79
normalized size	1	1.00	0.58	0.88	0.69	0.46	1.72	0.72	1.22
time (sec)	N/A	0.054	0.110	0.215	0.478	0.545	1.201	0.834	3.507

Problem 127	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	68	108	0	52	165	93	90
normalized size	1	1.00	0.96	1.52	0.00	0.73	2.32	1.31	1.27
time (sec)	N/A	0.048	0.330	0.422	0.000	0.678	0.396	1.620	3.892

Problem 128	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	89	89	95	174	0	74	233	145	161
normalized size	1	1.00	1.07	1.96	0.00	0.83	2.62	1.63	1.81
time (sec)	N/A	0.059	0.243	0.428	0.000	0.605	0.588	0.927	6.873

Problem 129	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	117	240	0	96	301	197	216
normalized size	1	1.00	1.09	2.24	0.00	0.90	2.81	1.84	2.02
time (sec)	N/A	0.062	0.485	0.420	0.000	0.578	0.757	1.025	5.650

Problem 130	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	117	89	87	194	0	87	119
normalized size	1	1.00	1.07	0.82	0.80	1.78	0.00	0.80	1.09
time (sec)	N/A	0.069	1.020	0.452	0.452	0.562	0.000	2.356	3.605

Problem 131	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	106	89	87	153	0	87	103
normalized size	1	1.00	1.29	1.09	1.06	1.87	0.00	1.06	1.26
time (sec)	N/A	0.061	0.665	0.388	0.437	0.576	0.000	1.724	3.487

Problem 132	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	97	68	67	112	0	67	114
normalized size	1	1.00	1.76	1.24	1.22	2.04	0.00	1.22	2.07
time (sec)	N/A	0.047	0.598	0.384	0.316	0.597	0.000	1.722	3.342

Problem 133	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	B	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	84	47	47	69	0	47	77
normalized size	1	1.00	3.11	1.74	1.74	2.56	0.00	1.74	2.85
time (sec)	N/A	0.039	0.466	0.394	0.358	0.576	0.000	1.432	3.340

Problem 134	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	113	52	45	110	0	128	41
normalized size	1	1.00	1.95	0.90	0.78	1.90	0.00	2.21	0.71
time (sec)	N/A	0.047	0.472	0.384	0.410	0.731	0.000	1.028	3.371

Problem 135	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	88	40	66	55	0	100	42
normalized size	1	1.00	1.76	0.80	1.32	1.10	0.00	2.00	0.84
time (sec)	N/A	0.049	0.250	0.433	0.596	0.521	0.000	1.448	3.407

Problem 136	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	42	24	21	30	153	57	20
normalized size	1	1.00	1.56	0.89	0.78	1.11	5.67	2.11	0.74
time (sec)	N/A	0.053	0.102	0.260	0.349	0.579	2.122	1.547	3.350

Problem 137	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	93	98	0	54	160	80	50
normalized size	1	1.00	1.06	1.11	0.00	0.61	1.82	0.91	0.57
time (sec)	N/A	0.047	0.247	0.109	0.000	0.435	0.335	0.659	3.490

Problem 138	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	141	141	115	137	0	76	228	119	124
normalized size	1	1.00	0.82	0.97	0.00	0.54	1.62	0.84	0.88
time (sec)	N/A	0.086	0.297	0.414	0.000	0.549	0.494	1.738	3.678

Problem 139	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	195	195	137	176	0	98	296	136	173
normalized size	1	1.00	0.70	0.90	0.00	0.50	1.52	0.70	0.89
time (sec)	N/A	0.116	0.528	0.421	0.000	0.542	0.607	2.348	5.040

Problem 140	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	119	119	113	430	341	278	0	164	150
normalized size	1	1.00	0.95	3.61	2.87	2.34	0.00	1.38	1.26
time (sec)	N/A	0.115	0.490	0.412	0.453	0.521	0.000	1.941	6.079

Problem 141	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	63	258	215	182	0	112	135
normalized size	1	1.00	0.68	2.77	2.31	1.96	0.00	1.20	1.45
time (sec)	N/A	0.098	0.434	0.397	0.438	0.748	0.000	1.539	5.443

Problem 142	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	108	108	329	112	0	110	105
normalized size	1	1.00	1.66	1.66	5.06	1.72	0.00	1.69	1.62
time (sec)	N/A	0.085	0.339	0.392	0.544	0.538	0.000	1.550	3.770

Problem 143	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	32	57	29	17	80	36	68
normalized size	1	1.00	1.00	1.78	0.91	0.53	2.50	1.12	2.12
time (sec)	N/A	0.037	0.066	0.454	0.370	0.508	2.087	1.696	3.444

Problem 144	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	54	90	69	41	219	73	133
normalized size	1	1.00	0.55	0.92	0.70	0.42	2.23	0.74	1.36
time (sec)	N/A	0.077	0.182	0.226	0.418	0.489	2.181	1.120	3.680

Problem 145	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	76	141	0	63	201	119	134
normalized size	1	1.00	0.75	1.40	0.00	0.62	1.99	1.18	1.33
time (sec)	N/A	0.081	0.223	0.410	0.000	0.598	0.521	1.534	5.899

Problem 146	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	98	207	0	85	269	171	188
normalized size	1	1.00	0.81	1.71	0.00	0.70	2.22	1.41	1.55
time (sec)	N/A	0.113	0.303	0.426	0.000	0.659	0.692	1.662	6.609

Problem 147	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	139	139	120	273	0	107	337	223	136
normalized size	1	1.00	0.86	1.96	0.00	0.77	2.42	1.60	0.98
time (sec)	N/A	0.117	0.712	0.419	0.000	0.418	0.884	1.740	5.517

Problem 148	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	136	99	97	168	0	97	120
normalized size	1	1.00	1.66	1.21	1.18	2.05	0.00	1.18	1.46
time (sec)	N/A	0.064	0.787	0.415	0.389	0.542	0.000	3.645	3.517

Problem 149	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	127	67	67	127	0	67	113
normalized size	1	1.00	2.31	1.22	1.22	2.31	0.00	1.22	2.05
time (sec)	N/A	0.047	0.528	0.388	0.522	0.660	0.000	1.974	3.336

Problem 150	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	116	57	57	84	0	55	93
normalized size	1	1.00	4.30	2.11	2.11	3.11	0.00	2.04	3.44
time (sec)	N/A	0.040	0.449	0.376	0.365	0.596	0.000	2.158	3.389

Problem 151	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	168	68	53	153	0	154	60
normalized size	1	1.00	1.87	0.76	0.59	1.70	0.00	1.71	0.67
time (sec)	N/A	0.056	0.780	0.398	0.769	0.498	0.000	1.994	3.385

Problem 152	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	214	53	96	101	0	145	55
normalized size	1	1.00	3.40	0.84	1.52	1.60	0.00	2.30	0.87
time (sec)	N/A	0.053	0.721	0.389	0.807	0.619	0.000	1.779	3.357

Problem 153	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	32	36	67	17	95	44	25
normalized size	1	1.00	1.10	1.24	2.31	0.59	3.28	1.52	0.86
time (sec)	N/A	0.041	0.073	0.449	0.680	0.662	3.787	1.694	3.388

Problem 154	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	56	24	21	41	272	85	19
normalized size	1	1.00	2.07	0.89	0.78	1.52	10.07	3.15	0.70
time (sec)	N/A	0.039	0.190	0.266	0.384	0.580	3.884	1.659	3.398

Problem 155	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	98	118	0	65	190	92	60
normalized size	1	1.00	0.84	1.02	0.00	0.56	1.64	0.79	0.52
time (sec)	N/A	0.062	0.231	0.109	0.000	0.398	0.412	0.890	3.502

Problem 156	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	169	169	120	156	0	87	260	123	90
normalized size	1	1.00	0.71	0.92	0.00	0.51	1.54	0.73	0.53
time (sec)	N/A	0.096	0.344	0.428	0.000	0.643	0.556	2.120	4.132

Problem 157	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	224	224	142	196	0	109	328	147	197
normalized size	1	1.00	0.63	0.88	0.00	0.49	1.46	0.66	0.88
time (sec)	N/A	0.125	0.757	0.430	0.000	0.561	0.684	2.159	4.939

Problem 158	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	237	342	295	230	0	151	197
normalized size	1	1.00	1.78	2.57	2.22	1.73	0.00	1.14	1.48
time (sec)	N/A	0.114	1.199	0.418	0.545	0.512	0.000	2.115	6.874

Problem 159	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	988	192	467	160	0	113	162
normalized size	1	1.00	9.23	1.79	4.36	1.50	0.00	1.06	1.51
time (sec)	N/A	0.101	6.188	0.417	0.965	0.457	0.000	2.022	5.518

Problem 160	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	247	86	141	76	0	71	88
normalized size	1	1.00	3.01	1.05	1.72	0.93	0.00	0.87	1.07
time (sec)	N/A	0.087	0.311	0.467	0.553	0.520	0.000	1.708	3.675

Problem 161	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	40	90	53	30	182	73	133
normalized size	1	1.00	0.59	1.32	0.78	0.44	2.68	1.07	1.96
time (sec)	N/A	0.079	0.099	0.469	0.371	0.556	3.852	1.602	3.658

Problem 162	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	132	132	73	123	91	52	354	99	64
normalized size	1	1.00	0.55	0.93	0.69	0.39	2.68	0.75	0.48
time (sec)	N/A	0.108	0.224	0.227	0.443	0.538	3.902	1.952	3.740

Problem 163	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	95	174	0	74	233	145	161
normalized size	1	1.00	0.71	1.30	0.00	0.55	1.74	1.08	1.20
time (sec)	N/A	0.120	0.245	0.428	0.000	0.525	0.641	2.293	7.413

Problem 164	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	117	240	0	96	301	197	216
normalized size	1	1.00	0.75	1.54	0.00	0.62	1.93	1.26	1.38
time (sec)	N/A	0.148	0.508	0.437	0.000	0.446	0.815	2.518	5.611

Problem 165	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	174	174	139	306	0	118	369	249	262
normalized size	1	1.00	0.80	1.76	0.00	0.68	2.12	1.43	1.51
time (sec)	N/A	0.158	0.902	0.482	0.000	0.552	0.998	2.448	6.967

Problem 166	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	599	120	232	269	0	250	105
normalized size	1	1.00	4.47	0.90	1.73	2.01	0.00	1.87	0.78
time (sec)	N/A	0.079	2.867	0.505	0.437	0.639	0.000	7.376	3.449

Problem 167	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	537	107	213	195	0	223	114
normalized size	1	1.00	4.26	0.85	1.69	1.55	0.00	1.77	0.90
time (sec)	N/A	0.077	1.555	0.450	0.356	0.657	0.000	4.972	3.440

Problem 168	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	397	92	189	123	0	198	104
normalized size	1	1.00	3.42	0.79	1.63	1.06	0.00	1.71	0.90
time (sec)	N/A	0.068	1.055	0.443	0.672	0.607	0.000	3.985	3.498

Problem 169	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	32	63	161	17	160	70	73
normalized size	1	1.00	0.74	1.47	3.74	0.40	3.72	1.63	1.70
time (sec)	N/A	0.043	0.072	0.527	0.370	0.556	35.850	4.800	3.507

Problem 170	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	56	49	142	41	466	137	85
normalized size	1	1.00	0.69	0.60	1.75	0.51	5.75	1.69	1.05
time (sec)	N/A	0.056	0.279	0.523	0.342	0.663	36.097	5.213	3.499

Problem 171	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	78	36	122	63	774	163	85
normalized size	1	1.00	1.42	0.65	2.22	1.15	14.07	2.96	1.55
time (sec)	N/A	0.048	0.266	0.488	0.476	0.699	36.698	3.388	3.503

Problem 172	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	100	24	21	85	1081	189	19
normalized size	1	1.00	3.70	0.89	0.78	3.15	40.04	7.00	0.70
time (sec)	N/A	0.039	0.309	0.291	0.541	0.801	36.825	3.576	3.562

Problem 173	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	229	229	148	196	0	109	326	132	198
normalized size	1	1.00	0.65	0.86	0.00	0.48	1.42	0.58	0.86
time (sec)	N/A	0.153	0.718	0.112	0.000	0.689	0.748	1.599	4.956

Problem 174	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	278	278	170	234	0	131	396	163	235
normalized size	1	1.00	0.61	0.84	0.00	0.47	1.42	0.59	0.85
time (sec)	N/A	0.144	1.235	0.452	0.000	0.675	0.908	5.751	5.292

Problem 175	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	333	333	192	274	0	153	464	188	294
normalized size	1	1.00	0.58	0.82	0.00	0.46	1.39	0.56	0.88
time (sec)	N/A	0.181	1.728	0.487	0.000	0.612	1.055	5.546	5.704

Problem 176	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	A	F	A	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	205	205	1704	409	796	267	0	195	344
normalized size	1	1.00	8.31	2.00	3.88	1.30	0.00	0.95	1.68
time (sec)	N/A	0.217	6.403	0.466	1.236	0.818	0.000	6.774	7.566

Problem 177	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	1244	282	541	182	0	165	284
normalized size	1	1.00	6.80	1.54	2.96	0.99	0.00	0.90	1.55
time (sec)	N/A	0.200	6.282	0.456	0.630	0.754	0.000	5.566	7.438

Problem 178	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	304	176	185	98	0	123	207
normalized size	1	1.00	1.95	1.13	1.19	0.63	0.00	0.79	1.33
time (sec)	N/A	0.216	1.080	0.516	0.750	0.527	0.000	4.738	6.936

Problem 179	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	40	156	53	30	311	125	37
normalized size	1	1.00	0.59	2.29	0.78	0.44	4.57	1.84	0.54
time (sec)	N/A	0.080	0.125	0.515	0.680	0.472	35.765	6.554	3.745

Problem 180	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	73	189	97	52	620	151	64
normalized size	1	1.00	0.53	1.37	0.70	0.38	4.49	1.09	0.46
time (sec)	N/A	0.175	0.320	0.517	0.405	0.464	35.829	4.866	3.915

Problem 181	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	213	213	95	222	141	74	928	177	159
normalized size	1	1.00	0.45	1.04	0.66	0.35	4.36	0.83	0.75
time (sec)	N/A	0.276	0.324	0.541	0.417	0.578	36.209	3.947	4.222

Problem 182	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	269	269	117	255	179	96	1221	203	224
normalized size	1	1.00	0.43	0.95	0.67	0.36	4.54	0.75	0.83
time (sec)	N/A	0.260	0.640	0.251	0.650	0.591	36.317	3.577	5.360

Problem 183	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	271	271	139	306	0	118	369	249	262
normalized size	1	1.00	0.51	1.13	0.00	0.44	1.36	0.92	0.97
time (sec)	N/A	0.312	1.138	0.466	0.000	0.548	1.017	5.561	6.665

Problem 184	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	301	301	161	372	0	140	437	301	308
normalized size	1	1.00	0.53	1.24	0.00	0.47	1.45	1.00	1.02
time (sec)	N/A	0.384	1.525	0.480	0.000	0.569	1.296	5.931	9.524

Problem 185	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	123	123	156	365	0	0	0	0	-1
normalized size	1	1.00	1.27	2.97	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.091	2.214	0.937	0.000	0.412	0.000	0.000	0.000

Problem 186	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	57	192	0	0	0	0	-1
normalized size	1	1.00	0.61	2.04	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.060	0.551	0.832	0.000	0.788	0.000	0.000	0.000

Problem 187	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	102	351	0	0	0	0	-1
normalized size	1	1.00	1.13	3.90	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.061	0.846	0.819	0.000	0.443	0.000	0.000	0.000

Problem 188	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	60	60	44	164	0	0	0	0	40
normalized size	1	1.00	0.73	2.73	0.00	0.00	0.00	0.00	0.67
time (sec)	N/A	0.043	0.265	0.894	0.000	0.859	0.000	0.000	3.784

Problem 189	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	60	60	73	910	0	0	0	0	-1
normalized size	1	1.00	1.22	15.17	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.047	0.364	0.908	0.000	0.680	0.000	0.000	0.000

Problem 190	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	62	170	0	0	0	0	-1
normalized size	1	1.00	0.65	1.77	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.068	0.424	0.779	0.000	0.480	0.000	0.000	0.000

Problem 191	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	99	341	0	0	0	0	-1
normalized size	1	1.00	1.03	3.55	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.065	0.801	0.815	0.000	0.533	0.000	0.000	0.000

Problem 192	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	121	187	0	0	0	0	-1
normalized size	1	1.00	0.97	1.50	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.082	0.761	0.835	0.000	0.740	0.000	0.000	0.000

Problem 193	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	267	374	0	0	0	0	-1
normalized size	1	1.00	1.93	2.71	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.117	2.672	0.898	0.000	0.582	0.000	0.000	0.000

Problem 194	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	67	201	0	0	0	0	-1
normalized size	1	1.00	0.63	1.90	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.089	0.742	0.911	0.000	0.537	0.000	0.000	0.000

Problem 195	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	132	1099	0	0	0	0	-1
normalized size	1	1.00	1.23	10.27	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.081	1.187	0.964	0.000	0.599	0.000	0.000	0.000

Problem 196	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	114	173	0	0	0	0	-1
normalized size	1	1.00	1.34	2.04	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.071	0.589	0.836	0.000	0.630	0.000	0.000	0.000

Problem 197	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	114	343	0	0	0	0	-1
normalized size	1	1.00	1.34	4.04	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.072	1.154	0.814	0.000	0.524	0.000	0.000	0.000

Problem 198	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	133	189	0	0	0	0	-1
normalized size	1	1.00	1.15	1.63	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.087	1.036	0.850	0.000	0.629	0.000	0.000	0.000

Problem 199	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	133	353	0	0	0	0	-1
normalized size	1	1.00	1.15	3.04	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.087	1.880	0.940	0.000	0.679	0.000	0.000	0.000

Problem 200	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	155	205	0	0	0	0	-1
normalized size	1	1.00	1.05	1.39	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.106	1.387	1.062	0.000	0.664	0.000	0.000	0.000

Problem 201	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	202	202	442	402	0	0	0	0	-1
normalized size	1	1.00	2.19	1.99	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.201	7.849	1.089	0.000	0.519	0.000	0.000	0.000

Problem 202	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	175	175	89	229	0	0	0	0	-1
normalized size	1	1.00	0.51	1.31	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.188	1.929	1.028	0.000	0.685	0.000	0.000	0.000

Problem 203	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	175	175	129	392	0	0	0	0	-1
normalized size	1	1.00	0.74	2.24	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.185	2.731	0.987	0.000	0.494	0.000	0.000	0.000

Problem 204	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	139	139	79	213	0	0	0	0	-1
normalized size	1	1.00	0.57	1.53	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.139	1.450	0.983	0.000	0.544	0.000	0.000	0.000

Problem 205	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	146	101	1564	0	0	0	0	-1
normalized size	1	1.18	0.81	12.61	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.134	1.811	1.016	0.000	0.823	0.000	0.000	0.000

Problem 206	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	123	175	0	0	0	0	-1
normalized size	1	1.00	1.11	1.58	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.102	0.807	0.962	0.000	0.521	0.000	0.000	0.000

Problem 207	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	108	1086	0	0	0	0	-1
normalized size	1	1.00	0.97	9.78	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.101	1.447	0.956	0.000	0.668	0.000	0.000	0.000

Problem 208	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	133	199	0	0	0	0	-1
normalized size	1	1.00	1.07	1.60	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.127	1.030	0.900	0.000	0.554	0.000	0.000	0.000

Problem 209	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	118	370	0	0	0	0	-1
normalized size	1	1.00	0.95	2.98	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.127	2.671	0.975	0.000	0.525	0.000	0.000	0.000

Problem 210	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	155	155	148	216	0	0	0	0	-1
normalized size	1	1.00	0.95	1.39	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.155	1.377	1.003	0.000	0.547	0.000	0.000	0.000

Problem 211	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	155	155	155	380	0	0	0	0	-1
normalized size	1	1.00	1.00	2.45	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.148	6.673	1.160	0.000	0.654	0.000	0.000	0.000

Problem 212	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	186	186	170	232	0	0	0	0	-1
normalized size	1	1.00	0.91	1.25	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.173	2.033	1.212	0.000	0.469	0.000	0.000	0.000

Problem 213	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	215	215	429	401	0	0	0	0	-1
normalized size	1	1.00	2.00	1.87	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.257	7.823	1.006	0.000	0.664	0.000	0.000	0.000

Problem 214	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	101	230	0	0	0	0	-1
normalized size	1	1.00	0.55	1.26	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.202	1.757	0.999	0.000	0.527	0.000	0.000	0.000

Problem 215	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	178	178	123	1618	0	0	0	0	-1
normalized size	1	1.00	0.69	9.09	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.186	4.357	1.049	0.000	0.635	0.000	0.000	0.000

Problem 216	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	146	146	130	200	0	0	0	0	-1
normalized size	1	1.00	0.89	1.37	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.149	1.390	0.969	0.000	0.698	0.000	0.000	0.000

Problem 217	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	110	2196	0	0	0	0	-1
normalized size	1	1.00	0.71	14.08	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.139	2.786	1.073	0.000	0.548	0.000	0.000	0.000

Problem 218	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	133	200	0	0	0	0	-1
normalized size	1	1.00	1.06	1.60	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.134	1.227	0.925	0.000	0.631	0.000	0.000	0.000

Problem 219	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	108	370	0	0	0	0	-1
normalized size	1	1.00	0.86	2.96	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.131	3.947	0.965	0.000	0.632	0.000	0.000	0.000

Problem 220	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	148	215	0	0	0	0	-1
normalized size	1	1.00	0.95	1.38	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.147	1.652	1.033	0.000	0.585	0.000	0.000	0.000

Problem 221	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	450	380	0	0	0	0	-1
normalized size	1	1.00	2.88	2.44	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.147	7.216	1.141	0.000	0.517	0.000	0.000	0.000

Problem 222	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	187	187	155	232	0	0	0	0	-1
normalized size	1	1.00	0.83	1.24	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.167	2.324	1.149	0.000	0.702	0.000	0.000	0.000

Problem 223	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	128	375	0	0	0	0	-1
normalized size	1	1.00	0.94	2.76	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.108	1.593	1.161	0.000	0.515	0.000	0.000	0.000

Problem 224	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	62	202	0	0	0	0	-1
normalized size	1	1.00	0.59	1.92	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.089	0.694	1.089	0.000	0.579	0.000	0.000	0.000

Problem 225	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	102	361	0	0	0	0	-1
normalized size	1	1.00	1.01	3.57	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.088	0.842	1.087	0.000	0.670	0.000	0.000	0.000

Problem 226	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	49	174	0	0	0	0	-1
normalized size	1	1.00	0.70	2.49	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.074	0.377	1.082	0.000	0.655	0.000	0.000	0.000

Problem 227	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	74	347	0	0	0	0	-1
normalized size	1	1.00	1.06	4.96	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.073	0.420	1.236	0.000	0.591	0.000	0.000	0.000

Problem 228	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	83	192	0	0	0	0	-1
normalized size	1	1.00	1.04	2.40	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.067	0.340	1.095	0.000	0.603	0.000	0.000	0.000

Problem 229	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	109	358	0	0	0	0	-1
normalized size	1	1.00	1.36	4.48	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.070	0.877	1.630	0.000	0.529	0.000	0.000	0.000

Problem 230	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	114	114	125	218	0	0	0	0	-1
normalized size	1	1.00	1.10	1.91	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.093	0.599	1.276	0.000	0.576	0.000	0.000	0.000

Problem 231	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	114	114	134	376	0	0	0	0	-1
normalized size	1	1.00	1.18	3.30	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.092	1.144	1.552	0.000	0.629	0.000	0.000	0.000

Problem 232	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	145	145	142	236	0	0	0	0	-1
normalized size	1	1.00	0.98	1.63	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.109	0.852	1.401	0.000	0.581	0.000	0.000	0.000

Problem 233	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	302	384	0	0	0	0	-1
normalized size	1	1.00	1.65	2.10	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.127	2.468	1.338	0.000	0.646	0.000	0.000	0.000

Problem 234	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	85	219	0	0	0	0	-1
normalized size	1	1.00	0.56	1.44	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.109	0.581	1.251	0.000	0.756	0.000	0.000	0.000

Problem 235	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	123	374	0	0	0	0	-1
normalized size	1	1.00	0.81	2.46	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.107	0.980	1.288	0.000	0.556	0.000	0.000	0.000

Problem 236	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	119	119	67	201	0	0	0	0	-1
normalized size	1	1.00	0.56	1.69	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.089	0.368	1.177	0.000	0.810	0.000	0.000	0.000

Problem 237	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	80	352	0	0	0	0	-1
normalized size	1	1.00	0.70	3.06	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.089	0.534	1.217	0.000	0.545	0.000	0.000	0.000

Problem 238	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	101	201	0	0	0	0	-1
normalized size	1	1.00	1.12	2.23	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.073	0.427	1.131	0.000	1.006	0.000	0.000	0.000

Problem 239	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	102	361	0	0	0	0	-1
normalized size	1	1.00	1.13	4.01	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.075	0.577	1.176	0.000	0.650	0.000	0.000	0.000

Problem 240	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	112	180	0	0	0	0	-1
normalized size	1	1.00	0.97	1.55	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.083	0.463	0.999	0.000	0.548	0.000	0.000	0.000

Problem 241	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	123	366	0	0	0	0	-1
normalized size	1	1.00	1.06	3.16	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.084	1.451	1.424	0.000	0.616	0.000	0.000	0.000

Problem 242	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	134	234	0	0	0	0	-1
normalized size	1	1.00	0.89	1.56	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.110	0.612	1.398	0.000	0.704	0.000	0.000	0.000

Problem 243	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	149	386	0	0	0	0	-1
normalized size	1	1.00	0.99	2.57	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.109	2.221	1.601	0.000	0.671	0.000	0.000	0.000

Problem 244	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	181	181	151	252	0	0	0	0	-1
normalized size	1	1.00	0.83	1.39	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.131	1.000	1.550	0.000	0.814	0.000	0.000	0.000

Problem 245	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	178	178	128	392	0	0	0	0	-1
normalized size	1	1.00	0.72	2.20	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.170	1.649	1.408	0.000	0.473	0.000	0.000	0.000

Problem 246	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	141	141	74	213	0	0	0	0	-1
normalized size	1	1.00	0.52	1.51	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.150	0.677	1.340	0.000	0.642	0.000	0.000	0.000

Problem 247	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	141	141	93	388	0	0	0	0	-1
normalized size	1	1.00	0.66	2.75	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.149	1.056	1.360	0.000	0.616	0.000	0.000	0.000

Problem 248	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	125	203	0	0	0	0	-1
normalized size	1	1.00	1.08	1.75	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.134	0.454	1.325	0.000	0.502	0.000	0.000	0.000

Problem 249	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	117	378	0	0	0	0	-1
normalized size	1	1.00	1.01	3.26	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.132	0.645	1.316	0.000	0.474	0.000	0.000	0.000

Problem 250	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	132	132	104	227	0	0	0	0	-1
normalized size	1	1.00	0.79	1.72	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.127	0.643	1.283	0.000	0.579	0.000	0.000	0.000

Problem 251	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	132	132	140	388	0	0	0	0	-1
normalized size	1	1.00	1.06	2.94	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.129	0.850	1.338	0.000	0.839	0.000	0.000	0.000

Problem 252	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	129	236	0	0	0	0	-1
normalized size	1	1.00	0.85	1.55	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.140	0.523	1.448	0.000	0.718	0.000	0.000	0.000

Problem 253	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	145	395	0	0	0	0	-1
normalized size	1	1.00	0.95	2.60	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.145	1.450	1.725	0.000	0.824	0.000	0.000	0.000

Problem 254	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	186	186	151	261	0	0	0	0	-1
normalized size	1	1.00	0.81	1.40	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.182	0.734	1.601	0.000	0.642	0.000	0.000	0.000

Problem 255	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	192	192	124	401	0	0	0	0	-1
normalized size	1	1.00	0.65	2.09	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.175	1.434	1.486	0.000	0.423	0.000	0.000	0.000

Problem 256	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	157	157	134	228	0	0	0	0	-1
normalized size	1	1.00	0.85	1.45	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.155	0.587	1.434	0.000	0.558	0.000	0.000	0.000

Problem 257	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	163	163	106	379	0	0	0	0	-1
normalized size	1	1.00	0.65	2.33	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.154	0.626	1.437	0.000	1.110	0.000	0.000	0.000

Problem 258	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	132	132	137	228	0	0	0	0	-1
normalized size	1	1.00	1.04	1.73	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.137	0.556	1.372	0.000	0.535	0.000	0.000	0.000

Problem 259	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	132	132	149	390	0	0	0	0	-1
normalized size	1	1.00	1.13	2.95	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.138	0.803	1.411	0.000	0.469	0.000	0.000	0.000

Problem 260	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	163	163	144	243	0	0	0	0	-1
normalized size	1	1.00	0.88	1.49	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.144	0.610	1.385	0.000	0.565	0.000	0.000	0.000

Problem 261	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	163	163	142	398	0	0	0	0	-1
normalized size	1	1.00	0.87	2.44	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.146	1.524	1.419	0.000	0.533	0.000	0.000	0.000

Problem 262	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	191	191	137	252	0	0	0	0	-1
normalized size	1	1.00	0.72	1.32	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.192	0.628	1.356	0.000	1.146	0.000	0.000	0.000

Problem 263	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	104	0	0	0	0	0	-1
normalized size	1	1.00	1.51	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.166	1.267	0.581	0.000	0.978	0.000	0.000	0.000

Problem 264	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	92	0	0	0	0	0	-1
normalized size	1	1.00	1.37	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.147	0.596	0.590	0.000	0.708	0.000	0.000	0.000

Problem 265	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	98	0	0	0	0	0	-1
normalized size	1	1.00	1.46	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.154	0.468	0.588	0.000	0.665	0.000	0.000	0.000

Problem 266	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	106	0	0	0	0	0	-1
normalized size	1	1.00	1.54	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.152	0.482	0.625	0.000	0.690	0.000	0.000	0.000

Problem 267	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	267	0	0	0	0	0	-1
normalized size	1	1.00	3.76	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.177	2.820	0.626	0.000	0.589	0.000	0.000	0.000

Problem 268	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	128	0	0	0	0	0	-1
normalized size	1	1.00	1.86	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.158	1.076	0.622	0.000	0.500	0.000	0.000	0.000

Problem 269	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	132	0	0	0	0	0	-1
normalized size	1	1.00	1.59	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.166	1.288	0.588	0.000	0.678	0.000	0.000	0.000

Problem 270	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	105	0	0	0	0	0	-1
normalized size	1	1.00	1.24	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.180	0.732	0.652	0.000	0.585	0.000	0.000	0.000

Problem 271	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	84	0	0	0	0	0	-1
normalized size	1	1.00	1.01	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.175	0.509	0.936	0.000	0.787	0.000	0.000	0.000

Problem 272	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	103	0	0	0	0	0	-1
normalized size	1	1.00	1.27	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.169	0.486	0.998	0.000	0.695	0.000	0.000	0.000

Problem 273	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	112	0	0	0	0	0	-1
normalized size	1	1.00	1.58	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.183	0.988	0.882	0.000	0.923	0.000	0.000	0.000

Problem 274	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	119	0	0	0	0	0	-1
normalized size	1	1.00	1.68	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.209	0.950	0.889	0.000	0.519	0.000	0.000	0.000

Problem 275	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	128	0	0	0	0	0	-1
normalized size	1	1.00	1.47	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.185	0.764	1.076	0.000	0.445	0.000	0.000	0.000

Problem 276	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	121	0	0	0	0	0	-1
normalized size	1	1.00	1.39	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.170	0.615	1.078	0.000	1.201	0.000	0.000	0.000

Problem 277	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	141	0	0	0	0	0	-1
normalized size	1	1.00	1.99	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.180	1.446	1.032	0.000	0.577	0.000	0.000	0.000

Problem 278	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	143	0	0	0	0	0	-1
normalized size	1	1.00	2.01	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.190	0.911	1.036	0.000	0.535	0.000	0.000	0.000

Problem 279	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	117	117	95	141	76	154	0	0	474
normalized size	1	1.00	0.81	1.21	0.65	1.32	0.00	0.00	4.05
time (sec)	N/A	0.075	0.884	4.755	0.529	0.688	0.000	0.000	12.118

Problem 280	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	77	114	58	119	0	0	352
normalized size	1	1.00	0.88	1.30	0.66	1.35	0.00	0.00	4.00
time (sec)	N/A	0.069	0.437	1.432	0.414	0.477	0.000	0.000	7.015

Problem 281	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	58	87	40	84	0	0	230
normalized size	1	1.00	0.98	1.47	0.68	1.42	0.00	0.00	3.90
time (sec)	N/A	0.062	0.353	1.415	0.540	0.460	0.000	0.000	6.253

Problem 282	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	34	24	21	46	0	55	82
normalized size	1	1.00	1.17	0.83	0.72	1.59	0.00	1.90	2.83
time (sec)	N/A	0.056	0.182	0.243	0.425	0.473	0.000	2.138	0.575

Problem 283	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	120	105	397	122	252	0	0	-1
normalized size	1	1.00	0.88	3.31	1.02	2.10	0.00	0.00	-0.01
time (sec)	N/A	0.098	0.494	1.289	0.521	0.532	0.000	0.000	0.000

Problem 284	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	193	193	133	741	176	274	0	0	-1
normalized size	1	1.00	0.69	3.84	0.91	1.42	0.00	0.00	-0.01
time (sec)	N/A	0.112	0.459	1.350	0.851	1.387	0.000	0.000	0.000

Problem 285	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	266	266	159	1085	230	296	0	0	-1
normalized size	1	1.00	0.60	4.08	0.86	1.11	0.00	0.00	-0.00
time (sec)	N/A	0.142	0.777	1.431	0.585	0.578	0.000	0.000	0.000

Problem 286	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-1)	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	95	141	0	132	0	0	289
normalized size	1	1.00	0.65	0.96	0.00	0.90	0.00	0.00	1.97
time (sec)	N/A	0.250	0.673	1.959	0.000	0.566	0.000	0.000	8.354

Problem 287	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-1)	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	77	114	0	97	0	0	102
normalized size	1	1.00	0.70	1.04	0.00	0.88	0.00	0.00	0.93
time (sec)	N/A	0.178	0.450	1.279	0.000	1.464	0.000	0.000	6.078

Problem 288	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	63	87	225	62	0	0	88
normalized size	1	1.00	0.86	1.19	3.08	0.85	0.00	0.00	1.21
time (sec)	N/A	0.107	0.280	1.190	33.002	0.511	0.000	0.000	5.945

Problem 289	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	39	50	0	25	0	0	61
normalized size	1	1.00	1.26	1.61	0.00	0.81	0.00	0.00	1.97
time (sec)	N/A	0.028	0.182	0.885	0.000	0.527	0.000	0.000	0.352

Problem 290	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	87	217	774	183	0	0	-1
normalized size	1	1.00	1.05	2.61	9.33	2.20	0.00	0.00	-0.01
time (sec)	N/A	0.094	0.567	1.123	1.071	0.738	0.000	0.000	0.000

Problem 291	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	154	154	126	569	934	245	0	0	-1
normalized size	1	1.00	0.82	3.69	6.06	1.59	0.00	0.00	-0.01
time (sec)	N/A	0.223	0.535	1.344	0.822	0.577	0.000	0.000	0.000

Problem 292	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	223	223	152	913	2215	267	0	0	-1
normalized size	1	1.00	0.68	4.09	9.93	1.20	0.00	0.00	-0.00
time (sec)	N/A	0.391	0.644	1.319	2.004	0.511	0.000	0.000	0.000

Problem 293	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	117	117	111	152	76	170	0	0	544
normalized size	1	1.00	0.95	1.30	0.65	1.45	0.00	0.00	4.65
time (sec)	N/A	0.089	1.194	6.800	0.430	0.529	0.000	0.000	16.023

Problem 294	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	93	125	58	134	0	0	420
normalized size	1	1.00	1.06	1.42	0.66	1.52	0.00	0.00	4.77
time (sec)	N/A	0.077	0.613	1.716	0.328	0.537	0.000	0.000	7.306

Problem 295	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	81	98	40	98	0	0	296
normalized size	1	1.00	1.37	1.66	0.68	1.66	0.00	0.00	5.02
time (sec)	N/A	0.069	0.602	1.160	0.339	0.632	0.000	0.000	6.098

Problem 296	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	69	24	21	59	0	0	153
normalized size	1	1.00	2.38	0.83	0.72	2.03	0.00	0.00	5.28
time (sec)	N/A	0.061	0.344	0.185	0.369	0.688	0.000	0.000	1.365

Problem 297	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	97	398	98	241	0	0	-1
normalized size	1	1.00	1.04	4.28	1.05	2.59	0.00	0.00	-0.01
time (sec)	N/A	0.083	0.637	1.267	0.801	0.465	0.000	0.000	0.000

Problem 298	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	166	166	143	742	158	286	0	0	-1
normalized size	1	1.00	0.86	4.47	0.95	1.72	0.00	0.00	-0.01
time (sec)	N/A	0.106	0.841	1.322	0.891	0.468	0.000	0.000	0.000

Problem 299	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	239	239	169	1086	212	310	0	0	-1
normalized size	1	1.00	0.71	4.54	0.89	1.30	0.00	0.00	-0.00
time (sec)	N/A	0.134	1.112	1.514	0.809	0.823	0.000	0.000	0.000

Problem 300	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	109	125	996	125	0	0	293
normalized size	1	1.00	0.74	0.85	6.78	0.85	0.00	0.00	1.99
time (sec)	N/A	0.241	1.058	1.309	21.082	0.637	0.000	0.000	7.249

Problem 301	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	91	98	584	89	0	0	103
normalized size	1	1.00	0.83	0.89	5.31	0.81	0.00	0.00	0.94
time (sec)	N/A	0.177	0.515	1.121	1.536	0.706	0.000	0.000	6.022

Problem 302	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	57	71	0	53	0	0	98
normalized size	1	1.00	0.83	1.03	0.00	0.77	0.00	0.00	1.42
time (sec)	N/A	0.064	0.318	1.021	0.000	0.614	0.000	0.000	4.488

Problem 303	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	42	201	40	0	0	60
normalized size	1	1.00	1.00	1.35	6.48	1.29	0.00	0.00	1.94
time (sec)	N/A	0.049	0.151	1.040	0.863	0.595	0.000	0.000	0.231

Problem 304	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	101	570	883	222	0	0	-1
normalized size	1	1.00	0.83	4.67	7.24	1.82	0.00	0.00	-0.01
time (sec)	N/A	0.149	0.961	1.387	0.671	0.640	0.000	0.000	0.000

Problem 305	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-1)	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	192	192	160	914	0	274	0	0	-1
normalized size	1	1.00	0.83	4.76	0.00	1.43	0.00	0.00	-0.01
time (sec)	N/A	0.270	1.503	1.419	0.000	0.500	0.000	0.000	0.000

Problem 306	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	117	117	113	171	76	190	0	0	626
normalized size	1	1.00	0.97	1.46	0.65	1.62	0.00	0.00	5.35
time (sec)	N/A	0.086	1.452	18.975	0.440	0.658	0.000	0.000	15.904

Problem 307	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	97	144	58	152	0	0	498
normalized size	1	1.00	1.10	1.64	0.66	1.73	0.00	0.00	5.66
time (sec)	N/A	0.077	0.788	2.815	0.446	0.678	0.000	0.000	11.316

Problem 308	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	85	117	40	114	0	0	370
normalized size	1	1.00	1.44	1.98	0.68	1.93	0.00	0.00	6.27
time (sec)	N/A	0.071	0.591	1.301	0.531	0.463	0.000	0.000	6.421

Problem 309	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	73	24	21	73	0	0	242
normalized size	1	1.00	2.52	0.83	0.72	2.52	0.00	0.00	8.34
time (sec)	N/A	0.063	0.436	0.180	0.323	0.672	0.000	0.000	6.354

Problem 310	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	89	89	116	398	98	236	0	0	-1
normalized size	1	1.00	1.30	4.47	1.10	2.65	0.00	0.00	-0.01
time (sec)	N/A	0.083	0.656	1.182	0.546	0.564	0.000	0.000	0.000

Problem 311	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	137	137	116	744	140	262	0	0	-1
normalized size	1	1.00	0.85	5.43	1.02	1.91	0.00	0.00	-0.01
time (sec)	N/A	0.095	0.838	1.339	0.621	0.466	0.000	0.000	0.000

Problem 312	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	210	210	142	1088	194	308	0	0	-1
normalized size	1	1.00	0.68	5.18	0.92	1.47	0.00	0.00	-0.00
time (sec)	N/A	0.120	0.958	1.617	0.667	0.648	0.000	0.000	0.000

Problem 313	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-1)	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	103	117	0	121	0	0	301
normalized size	1	1.00	0.70	0.80	0.00	0.82	0.00	0.00	2.05
time (sec)	N/A	0.240	0.843	1.193	0.000	0.599	0.000	0.000	7.775

Problem 314	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	93	90	0	83	0	0	105
normalized size	1	1.00	0.89	0.87	0.00	0.80	0.00	0.00	1.01
time (sec)	N/A	0.101	0.389	0.898	0.000	0.619	0.000	0.000	6.083

Problem 315	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	46	53	331	44	0	0	64
normalized size	1	1.00	0.71	0.82	5.09	0.68	0.00	0.00	0.98
time (sec)	N/A	0.097	0.292	1.084	0.990	0.483	0.000	0.000	0.393

Problem 316	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	69	63	328	59	0	0	89
normalized size	1	1.00	1.97	1.80	9.37	1.69	0.00	0.00	2.54
time (sec)	N/A	0.060	0.341	1.254	1.208	0.537	0.000	0.000	0.908

Problem 317	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	159	159	118	916	1075	244	0	0	-1
normalized size	1	1.00	0.74	5.76	6.76	1.53	0.00	0.00	-0.01
time (sec)	N/A	0.218	1.124	1.464	1.104	0.726	0.000	0.000	0.000

Problem 318	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-1)	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	231	231	155	1260	0	300	0	0	-1
normalized size	1	1.00	0.67	5.45	0.00	1.30	0.00	0.00	-0.00
time (sec)	N/A	0.339	1.248	1.846	0.000	2.232	0.000	0.000	0.000

Problem 319	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	117	117	113	181	76	202	0	0	690
normalized size	1	1.00	0.97	1.55	0.65	1.73	0.00	0.00	5.90
time (sec)	N/A	0.084	1.848	56.570	0.328	0.910	0.000	0.000	15.040

Problem 320	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	97	154	58	164	0	0	562
normalized size	1	1.00	1.10	1.75	0.66	1.86	0.00	0.00	6.39
time (sec)	N/A	0.077	0.954	6.768	0.675	2.797	0.000	0.000	15.661

Problem 321	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	85	127	40	126	0	0	434
normalized size	1	1.00	1.44	2.15	0.68	2.14	0.00	0.00	7.36
time (sec)	N/A	0.068	0.795	1.672	0.668	0.467	0.000	0.000	7.566

Problem 322	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	73	24	21	85	0	0	306
normalized size	1	1.00	2.52	0.83	0.72	2.93	0.00	0.00	10.55
time (sec)	N/A	0.062	0.470	0.176	0.417	0.461	0.000	0.000	6.283

Problem 323	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	137	412	117	235	0	0	-1
normalized size	1	1.00	1.18	3.55	1.01	2.03	0.00	0.00	-0.01
time (sec)	N/A	0.088	1.413	1.259	0.648	2.466	0.000	0.000	0.000

Problem 324	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	137	137	152	742	138	262	0	0	-1
normalized size	1	1.00	1.11	5.42	1.01	1.91	0.00	0.00	-0.01
time (sec)	N/A	0.094	1.493	1.276	0.589	0.701	0.000	0.000	0.000

Problem 325	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	181	181	129	1088	176	276	0	0	-1
normalized size	1	1.00	0.71	6.01	0.97	1.52	0.00	0.00	-0.01
time (sec)	N/A	0.108	1.107	1.630	0.597	0.892	0.000	0.000	0.000

Problem 326	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	139	139	109	100	0	109	0	0	286
normalized size	1	1.00	0.78	0.72	0.00	0.78	0.00	0.00	2.06
time (sec)	N/A	0.140	0.769	0.932	0.000	1.837	0.000	0.000	6.004

Problem 327	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	59	73	418	71	0	0	102
normalized size	1	1.00	0.57	0.70	4.02	0.68	0.00	0.00	0.98
time (sec)	N/A	0.153	0.443	1.097	1.026	1.059	0.000	0.000	4.718

Problem 328	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	86	71	504	59	0	0	85
normalized size	1	1.00	1.21	1.00	7.10	0.83	0.00	0.00	1.20
time (sec)	N/A	0.122	0.406	1.134	0.720	0.730	0.000	0.000	0.853

Problem 329	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	73	73	454	73	0	0	112
normalized size	1	1.00	2.09	2.09	12.97	2.09	0.00	0.00	3.20
time (sec)	N/A	0.059	0.572	1.517	0.665	1.955	0.000	0.000	5.255

Problem 330	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	196	196	131	1260	1250	258	0	0	-1
normalized size	1	1.00	0.67	6.43	6.38	1.32	0.00	0.00	-0.01
time (sec)	N/A	0.287	1.880	1.767	1.056	0.581	0.000	0.000	0.000

Problem 331	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-1)	A	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	268	268	188	1604	0	314	0	0	-1
normalized size	1	1.00	0.70	5.99	0.00	1.17	0.00	0.00	-0.00
time (sec)	N/A	0.411	3.328	2.236	0.000	1.407	0.000	0.000	0.000

Problem 332	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-1)	A	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	342	342	194	1948	0	342	0	0	-1
normalized size	1	1.00	0.57	5.70	0.00	1.00	0.00	0.00	-0.00
time (sec)	N/A	0.565	6.548	3.649	0.000	0.792	0.000	0.000	0.000

Problem 333	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	117	117	95	127	297	150	0	0	434
normalized size	1	1.00	0.81	1.09	2.54	1.28	0.00	0.00	3.71
time (sec)	N/A	0.080	0.631	1.813	0.766	1.932	0.000	0.000	8.939

Problem 334	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	77	100	169	113	0	0	306
normalized size	1	1.00	0.88	1.14	1.92	1.28	0.00	0.00	3.48
time (sec)	N/A	0.072	0.368	1.289	0.450	0.778	0.000	0.000	6.378

Problem 335	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	65	73	79	76	0	0	155
normalized size	1	1.00	1.10	1.24	1.34	1.29	0.00	0.00	2.63
time (sec)	N/A	0.064	0.231	1.197	0.324	0.626	0.000	0.000	1.314

Problem 336	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	32	24	21	37	0	55	47
normalized size	1	1.00	1.19	0.89	0.78	1.37	0.00	2.04	1.74
time (sec)	N/A	0.057	0.180	0.204	0.539	0.670	0.000	1.998	0.163

Problem 337	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	146	146	126	341	138	271	0	0	-1
normalized size	1	1.00	0.86	2.34	0.95	1.86	0.00	0.00	-0.01
time (sec)	N/A	0.098	0.655	1.150	0.620	1.306	0.000	0.000	0.000

Problem 338	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	219	219	152	368	192	293	0	0	-1
normalized size	1	1.00	0.69	1.68	0.88	1.34	0.00	0.00	-0.00
time (sec)	N/A	0.124	0.779	1.151	0.843	0.706	0.000	0.000	0.000

Problem 339	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	292	292	178	395	246	315	0	0	-1
normalized size	1	1.00	0.61	1.35	0.84	1.08	0.00	0.00	-0.00
time (sec)	N/A	0.153	1.116	1.289	0.560	0.939	0.000	0.000	0.000

Problem 340	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	95	154	608	153	0	0	301
normalized size	1	1.00	0.65	1.05	4.14	1.04	0.00	0.00	2.05
time (sec)	N/A	0.258	0.671	2.957	0.897	0.790	0.000	0.000	8.976

Problem 341	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	77	127	474	116	0	0	105
normalized size	1	1.00	0.70	1.15	4.31	1.05	0.00	0.00	0.95
time (sec)	N/A	0.187	0.440	1.438	0.791	0.918	0.000	0.000	6.156

Problem 342	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	65	100	340	79	0	0	91
normalized size	1	1.00	0.89	1.37	4.66	1.08	0.00	0.00	1.25
time (sec)	N/A	0.118	0.285	1.250	0.563	0.790	0.000	0.000	9.264

Problem 343	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	40	73	206	40	0	0	98
normalized size	1	1.00	1.14	2.09	5.89	1.14	0.00	0.00	2.80
time (sec)	N/A	0.054	0.171	1.175	0.687	0.707	0.000	0.000	1.019

Problem 344	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	70	137	0	149	0	0	-1
normalized size	1	1.00	1.35	2.63	0.00	2.87	0.00	0.00	-0.02
time (sec)	N/A	0.041	0.375	0.981	0.000	0.676	0.000	0.000	0.000

Problem 345	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	96	319	837	245	0	0	-1
normalized size	1	1.00	0.79	2.61	6.86	2.01	0.00	0.00	-0.01
time (sec)	N/A	0.134	0.554	1.146	1.270	0.683	0.000	0.000	0.000

Problem 346	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	193	193	117	346	1939	267	0	0	-1
normalized size	1	1.00	0.61	1.79	10.05	1.38	0.00	0.00	-0.01
time (sec)	N/A	0.266	0.668	1.119	1.451	0.709	0.000	0.000	0.000

Problem 347	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	117	117	110	117	76	149	0	0	370
normalized size	1	1.00	0.94	1.00	0.65	1.27	0.00	0.00	3.16
time (sec)	N/A	0.087	0.810	1.367	0.367	0.799	0.000	0.000	7.643

Problem 348	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	92	90	58	108	0	0	242
normalized size	1	1.00	1.05	1.02	0.66	1.23	0.00	0.00	2.75
time (sec)	N/A	0.079	0.394	1.152	0.415	0.574	0.000	0.000	6.676

Problem 349	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	80	61	38	67	0	0	85
normalized size	1	1.00	1.40	1.07	0.67	1.18	0.00	0.00	1.49
time (sec)	N/A	0.072	0.256	1.109	0.411	1.659	0.000	0.000	3.658

Problem 350	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	27	27	27	24	21	49	0	0	67
normalized size	1	1.00	1.00	0.89	0.78	1.81	0.00	0.00	2.48
time (sec)	N/A	0.065	0.164	0.188	0.452	0.715	0.000	0.000	0.244

Problem 351	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	175	175	142	368	153	294	0	0	-1
normalized size	1	1.00	0.81	2.10	0.87	1.68	0.00	0.00	-0.01
time (sec)	N/A	0.118	1.004	1.073	0.505	0.468	0.000	0.000	0.000

Problem 352	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	248	248	168	395	207	316	0	0	-1
normalized size	1	1.00	0.68	1.59	0.83	1.27	0.00	0.00	-0.00
time (sec)	N/A	0.144	1.257	1.152	0.551	0.711	0.000	0.000	0.000

Problem 353	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	321	321	203	422	261	338	0	0	-1
normalized size	1	1.00	0.63	1.31	0.81	1.05	0.00	0.00	-0.00
time (sec)	N/A	0.180	2.095	1.416	0.814	0.631	0.000	0.000	0.000

Problem 354	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	108	171	764	184	0	0	301
normalized size	1	1.00	0.73	1.16	5.20	1.25	0.00	0.00	2.05
time (sec)	N/A	0.262	0.994	6.824	1.117	2.151	0.000	0.000	9.862

Problem 355	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	92	144	626	143	0	0	105
normalized size	1	1.00	0.84	1.31	5.69	1.30	0.00	0.00	0.95
time (sec)	N/A	0.191	0.577	1.755	1.131	0.718	0.000	0.000	8.297

Problem 356	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	80	117	488	102	0	0	91
normalized size	1	1.00	1.10	1.60	6.68	1.40	0.00	0.00	1.25
time (sec)	N/A	0.129	0.430	1.218	0.867	0.815	0.000	0.000	6.437

Problem 357	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	59	90	350	59	0	0	139
normalized size	1	1.00	1.69	2.57	10.00	1.69	0.00	0.00	3.97
time (sec)	N/A	0.062	0.263	1.146	0.745	0.565	0.000	0.000	1.699

Problem 358	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	101	157	814	196	0	0	-1
normalized size	1	1.00	1.17	1.83	9.47	2.28	0.00	0.00	-0.01
time (sec)	N/A	0.102	0.799	1.154	1.104	0.598	0.000	0.000	0.000

Problem 359	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	95	318	0	246	0	0	-1
normalized size	1	1.00	1.09	3.66	0.00	2.83	0.00	0.00	-0.01
time (sec)	N/A	0.075	0.704	1.004	0.000	0.736	0.000	0.000	0.000

Problem 360	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	157	157	120	346	1820	270	0	0	-1
normalized size	1	1.00	0.76	2.20	11.59	1.72	0.00	0.00	-0.01
time (sec)	N/A	0.192	1.098	1.045	1.046	0.572	0.000	0.000	0.000

Problem 361	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	233	233	145	373	2632	292	0	0	-1
normalized size	1	1.00	0.62	1.60	11.30	1.25	0.00	0.00	-0.00
time (sec)	N/A	0.337	1.705	1.160	1.099	0.579	0.000	0.000	0.000

Problem 362	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	146	146	116	127	94	175	0	0	434
normalized size	1	1.00	0.79	0.87	0.64	1.20	0.00	0.00	2.97
time (sec)	N/A	0.093	0.876	1.828	0.366	1.734	0.000	0.000	8.762

Problem 363	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	117	117	108	100	76	134	0	0	306
normalized size	1	1.00	0.92	0.85	0.65	1.15	0.00	0.00	2.62
time (sec)	N/A	0.086	0.698	1.267	0.598	0.650	0.000	0.000	6.679

Problem 364	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	94	73	58	93	0	0	155
normalized size	1	1.00	1.09	0.85	0.67	1.08	0.00	0.00	1.80
time (sec)	N/A	0.079	0.425	1.175	0.320	1.120	0.000	0.000	1.228

Problem 365	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	55	55	36	65	44	49	0	0	72
normalized size	1	1.00	0.65	1.18	0.80	0.89	0.00	0.00	1.31
time (sec)	N/A	0.070	0.295	1.160	0.449	0.534	0.000	0.000	0.275

Problem 366	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	39	24	21	61	0	0	23
normalized size	1	1.00	1.34	0.83	0.72	2.10	0.00	0.00	0.79
time (sec)	N/A	0.063	0.244	0.186	0.558	0.514	0.000	0.000	3.584

Problem 367	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	204	204	163	395	175	305	0	0	-1
normalized size	1	1.00	0.80	1.94	0.86	1.50	0.00	0.00	-0.00
time (sec)	N/A	0.127	1.254	1.188	0.661	0.750	0.000	0.000	0.000

Problem 368	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	277	277	189	422	229	327	0	0	-1
normalized size	1	1.00	0.68	1.52	0.83	1.18	0.00	0.00	-0.00
time (sec)	N/A	0.157	1.707	1.371	0.563	0.860	0.000	0.000	0.000

Problem 369	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	112	181	902	199	0	0	301
normalized size	1	1.00	0.76	1.23	6.14	1.35	0.00	0.00	2.05
time (sec)	N/A	0.265	1.115	19.234	1.143	1.682	0.000	0.000	11.589

Problem 370	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	94	154	764	158	0	0	105
normalized size	1	1.00	0.85	1.40	6.95	1.44	0.00	0.00	0.95
time (sec)	N/A	0.193	0.758	2.898	1.018	0.753	0.000	0.000	8.751

Problem 371	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	80	127	626	117	0	0	91
normalized size	1	1.00	1.10	1.74	8.58	1.60	0.00	0.00	1.25
time (sec)	N/A	0.126	0.561	1.451	0.921	0.719	0.000	0.000	6.384

Problem 372	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	57	100	488	74	0	0	50
normalized size	1	1.00	1.63	2.86	13.94	2.11	0.00	0.00	1.43
time (sec)	N/A	0.063	0.459	1.172	0.996	0.513	0.000	0.000	2.016

Problem 373	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	123	123	82	281	1070	267	0	0	-1
normalized size	1	1.00	0.67	2.28	8.70	2.17	0.00	0.00	-0.01
time (sec)	N/A	0.170	0.866	1.212	1.213	0.516	0.000	0.000	0.000

Problem 374	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	149	443	826	244	0	0	-1
normalized size	1	1.00	1.73	5.15	9.60	2.84	0.00	0.00	-0.01
time (sec)	N/A	0.144	1.075	1.189	0.991	0.602	0.000	0.000	0.000

Problem 375	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	121	346	0	267	0	0	-1
normalized size	1	1.00	0.99	2.84	0.00	2.19	0.00	0.00	-0.01
time (sec)	N/A	0.115	0.878	1.067	0.000	0.496	0.000	0.000	0.000

Problem 376	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	192	192	143	373	2297	289	0	0	-1
normalized size	1	1.00	0.74	1.94	11.96	1.51	0.00	0.00	-0.01
time (sec)	N/A	0.259	1.373	1.094	1.226	0.688	0.000	0.000	0.000

Problem 377	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	270	270	165	400	3783	311	0	0	-1
normalized size	1	1.00	0.61	1.48	14.01	1.15	0.00	0.00	-0.00
time (sec)	N/A	0.422	1.386	1.250	1.382	0.805	0.000	0.000	0.000

Problem 378	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	146	146	114	117	94	160	0	0	370
normalized size	1	1.00	0.78	0.80	0.64	1.10	0.00	0.00	2.53
time (sec)	N/A	0.093	0.973	1.456	0.737	0.778	0.000	0.000	7.626

Problem 379	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	113	113	110	90	76	119	0	0	242
normalized size	1	1.00	0.97	0.80	0.67	1.05	0.00	0.00	2.14
time (sec)	N/A	0.086	0.684	1.211	0.474	0.684	0.000	0.000	6.736

Problem 380	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	61	88	62	77	0	0	110
normalized size	1	1.00	0.73	1.05	0.74	0.92	0.00	0.00	1.31
time (sec)	N/A	0.080	0.490	1.185	0.352	0.594	0.000	0.000	0.742

Problem 381	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	80	88	32	61	0	0	-1
normalized size	1	1.00	1.40	1.54	0.56	1.07	0.00	0.00	-0.02
time (sec)	N/A	0.074	0.230	1.147	0.341	0.618	0.000	0.000	0.000

Problem 382	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	29	29	39	24	21	72	0	0	23
normalized size	1	1.00	1.34	0.83	0.72	2.48	0.00	0.00	0.79
time (sec)	N/A	0.064	0.303	0.184	0.317	2.146	0.000	0.000	3.639

Problem 383	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	233	233	176	422	195	316	0	0	-1
normalized size	1	1.00	0.76	1.81	0.84	1.36	0.00	0.00	-0.00
time (sec)	N/A	0.142	1.707	1.242	0.585	0.524	0.000	0.000	0.000

Problem 384	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	306	306	202	449	249	338	0	0	-1
normalized size	1	1.00	0.66	1.47	0.81	1.10	0.00	0.00	-0.00
time (sec)	N/A	0.177	2.424	1.701	1.012	0.679	0.000	0.000	0.000

Problem 385	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	92	171	902	173	0	0	105
normalized size	1	1.00	0.84	1.55	8.20	1.57	0.00	0.00	0.95
time (sec)	N/A	0.194	1.100	6.861	1.080	0.867	0.000	0.000	9.276

Problem 386	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	73	73	82	144	764	132	0	0	91
normalized size	1	1.00	1.12	1.97	10.47	1.81	0.00	0.00	1.25
time (sec)	N/A	0.127	0.605	1.779	1.201	0.670	0.000	0.000	6.624

Problem 387	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	59	115	626	89	0	0	50
normalized size	1	1.00	1.69	3.29	17.89	2.54	0.00	0.00	1.43
time (sec)	N/A	0.062	0.457	1.204	1.017	0.765	0.000	0.000	6.490

Problem 388	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	160	160	130	399	1166	323	0	0	-1
normalized size	1	1.00	0.81	2.49	7.29	2.02	0.00	0.00	-0.01
time (sec)	N/A	0.251	1.218	1.265	1.090	0.595	0.000	0.000	0.000

Problem 389	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-1)	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	126	318	0	244	0	0	-1
normalized size	1	1.00	1.04	2.63	0.00	2.02	0.00	0.00	-0.01
time (sec)	N/A	0.217	0.953	1.205	0.000	0.571	0.000	0.000	0.000

Problem 390	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	120	346	976	267	0	0	-1
normalized size	1	1.00	0.96	2.77	7.81	2.14	0.00	0.00	-0.01
time (sec)	N/A	0.188	1.001	1.250	1.011	0.834	0.000	0.000	0.000

Problem 391	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	157	157	119	373	0	278	0	0	-1
normalized size	1	1.00	0.76	2.38	0.00	1.77	0.00	0.00	-0.01
time (sec)	N/A	0.165	1.506	0.941	0.000	0.667	0.000	0.000	0.000

Problem 392	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	227	227	141	400	2781	300	0	0	-1
normalized size	1	1.00	0.62	1.76	12.25	1.32	0.00	0.00	-0.00
time (sec)	N/A	0.375	2.195	1.168	0.930	0.781	0.000	0.000	0.000

Problem 393	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	307	307	175	427	5803	322	0	0	-1
normalized size	1	1.00	0.57	1.39	18.90	1.05	0.00	0.00	-0.00
time (sec)	N/A	0.520	2.487	1.451	1.640	0.608	0.000	0.000	0.000

Problem 394	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	524	524	373	309	1875	418	0	0	-1
normalized size	1	1.00	0.71	0.59	3.58	0.80	0.00	0.00	-0.00
time (sec)	N/A	0.445	1.752	1.371	1.209	0.546	0.000	0.000	0.000

Problem 395	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	323	323	277	230	1400	323	0	0	-1
normalized size	1	1.00	0.86	0.71	4.33	1.00	0.00	0.00	-0.00
time (sec)	N/A	0.191	1.658	1.330	0.844	0.653	0.000	0.000	0.000

Problem 396	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	36	56	76	64	0	0	-1
normalized size	1	1.00	1.00	1.56	2.11	1.78	0.00	0.00	-0.03
time (sec)	N/A	0.061	0.064	1.247	0.491	1.621	0.000	0.000	0.000

Problem 397	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	48	75	54	75	0	0	86
normalized size	1	1.00	0.59	0.93	0.67	0.93	0.00	0.00	1.06
time (sec)	N/A	0.132	0.187	1.301	0.925	0.695	0.000	0.000	4.630

Problem 398	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	63	85	130	86	0	0	101
normalized size	1	1.00	0.52	0.70	1.07	0.70	0.00	0.00	0.83
time (sec)	N/A	0.197	0.218	1.303	0.719	0.733	0.000	0.000	4.681

Problem 399	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	164	164	80	102	178	97	0	0	109
normalized size	1	1.00	0.49	0.62	1.09	0.59	0.00	0.00	0.66
time (sec)	N/A	0.283	0.272	1.374	0.877	0.635	0.000	0.000	5.159

Problem 400	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	453	453	376	414	3015	644	0	0	-1
normalized size	1	1.00	0.83	0.91	6.66	1.42	0.00	0.00	-0.00
time (sec)	N/A	0.506	4.149	1.255	1.420	0.668	0.000	0.000	0.000

Problem 401	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	B	A	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	571	571	11319	363	2380	538	0	0	-1
normalized size	1	1.00	19.82	0.64	4.17	0.94	0.00	0.00	-0.00
time (sec)	N/A	0.543	56.131	1.291	1.106	1.137	0.000	0.000	0.000

Problem 402	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	364	364	338	304	1881	420	0	0	-1
normalized size	1	1.00	0.93	0.84	5.17	1.15	0.00	0.00	-0.00
time (sec)	N/A	0.315	3.352	1.303	1.133	0.591	0.000	0.000	0.000

Problem 403	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	B	A	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	520	520	11314	286	1462	460	0	0	-1
normalized size	1	1.00	21.76	0.55	2.81	0.88	0.00	0.00	-0.00
time (sec)	N/A	0.434	6.168	1.237	0.904	0.568	0.000	0.000	0.000

Problem 404	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	38	76	76	76	0	0	-1
normalized size	1	1.00	1.00	2.00	2.00	2.00	0.00	0.00	-0.03
time (sec)	N/A	0.091	0.073	1.198	0.867	0.472	0.000	0.000	0.000

Problem 405	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	84	86	59	79	0	0	102
normalized size	1	1.00	1.04	1.06	0.73	0.98	0.00	0.00	1.26
time (sec)	N/A	0.158	0.379	1.194	0.957	0.784	0.000	0.000	4.705

Problem 406	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	98	103	84	91	0	0	110
normalized size	1	1.00	0.78	0.82	0.67	0.73	0.00	0.00	0.88
time (sec)	N/A	0.230	0.460	1.282	1.074	0.559	0.000	0.000	4.923

Problem 407	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	167	167	113	113	160	103	0	0	125
normalized size	1	1.00	0.68	0.68	0.96	0.62	0.00	0.00	0.75
time (sec)	N/A	0.286	0.588	1.328	1.383	1.016	0.000	0.000	5.584

Problem 408	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	B	A	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	612	612	11411	424	3018	635	0	0	-1
normalized size	1	1.00	18.65	0.69	4.93	1.04	0.00	0.00	-0.00
time (sec)	N/A	0.690	56.564	1.185	1.502	0.555	0.000	0.000	0.000

Problem 409	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	411	411	387	371	2438	525	0	0	-1
normalized size	1	1.00	0.94	0.90	5.93	1.28	0.00	0.00	-0.00
time (sec)	N/A	0.453	4.145	1.285	1.622	0.651	0.000	0.000	0.000

Problem 410	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	B	A	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	563	563	11357	347	2015	484	0	0	-1
normalized size	1	1.00	20.17	0.62	3.58	0.86	0.00	0.00	-0.00
time (sec)	N/A	0.575	6.330	1.257	1.351	0.488	0.000	0.000	0.000

Problem 411	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	362	362	343	323	1492	505	0	0	-1
normalized size	1	1.00	0.95	0.89	4.12	1.40	0.00	0.00	-0.00
time (sec)	N/A	0.330	3.652	1.224	1.005	0.556	0.000	0.000	0.000

Problem 412	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	38	88	76	80	0	0	104
normalized size	1	1.00	1.00	2.32	2.00	2.11	0.00	0.00	2.74
time (sec)	N/A	0.075	0.120	1.207	0.889	0.611	0.000	0.000	4.554

Problem 413	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	92	105	94	94	0	0	112
normalized size	1	1.00	1.14	1.30	1.16	1.16	0.00	0.00	1.38
time (sec)	N/A	0.154	0.448	1.211	1.054	0.628	0.000	0.000	4.992

Problem 414	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	104	115	96	99	0	0	127
normalized size	1	1.00	0.83	0.92	0.77	0.79	0.00	0.00	1.02
time (sec)	N/A	0.222	0.485	1.273	1.157	0.690	0.000	0.000	5.523

Problem 415	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	169	169	121	132	124	99	0	0	133
normalized size	1	1.00	0.72	0.78	0.73	0.59	0.00	0.00	0.79
time (sec)	N/A	0.312	0.738	1.417	1.105	0.447	0.000	0.000	6.067

Problem 416	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	369	369	350	316	2273	461	0	0	-1
normalized size	1	1.00	0.95	0.86	6.16	1.25	0.00	0.00	-0.00
time (sec)	N/A	0.308	3.697	1.330	0.968	0.819	0.000	0.000	0.000

Problem 417	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	483	483	302	232	726	385	0	0	-1
normalized size	1	1.00	0.63	0.48	1.50	0.80	0.00	0.00	-0.00
time (sec)	N/A	0.353	1.295	1.254	1.049	1.242	0.000	0.000	0.000

Problem 418	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	36	72	76	64	0	0	40
normalized size	1	1.00	1.00	2.00	2.11	1.78	0.00	0.00	1.11
time (sec)	N/A	0.068	0.066	1.162	0.668	0.420	0.000	0.000	4.307

Problem 419	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	48	85	80	78	0	0	78
normalized size	1	1.00	0.60	1.06	1.00	0.98	0.00	0.00	0.98
time (sec)	N/A	0.138	0.121	1.164	1.020	1.122	0.000	0.000	0.777

Problem 420	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	68	105	130	89	0	0	86
normalized size	1	1.00	0.56	0.87	1.07	0.74	0.00	0.00	0.71
time (sec)	N/A	0.220	0.266	1.169	0.861	0.799	0.000	0.000	4.030

Problem 421	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	165	165	79	115	178	100	0	0	101
normalized size	1	1.00	0.48	0.70	1.08	0.61	0.00	0.00	0.61
time (sec)	N/A	0.291	0.384	1.194	1.025	0.565	0.000	0.000	4.210

Problem 422	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	206	206	87	132	226	111	0	0	109
normalized size	1	1.00	0.42	0.64	1.10	0.54	0.00	0.00	0.53
time (sec)	N/A	0.387	0.426	1.247	1.140	0.682	0.000	0.000	4.312

Problem 423	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	A	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	529	529	11282	1022	1819	483	0	0	-1
normalized size	1	1.00	21.33	1.93	3.44	0.91	0.00	0.00	-0.00
time (sec)	N/A	0.567	52.087	1.162	1.248	0.697	0.000	0.000	0.000

Problem 424	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	365	365	338	957	778	539	0	0	-1
normalized size	1	1.00	0.93	2.62	2.13	1.48	0.00	0.00	-0.00
time (sec)	N/A	0.316	4.030	1.320	1.318	0.659	0.000	0.000	0.000

Problem 425	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	38	87	76	67	0	0	-1
normalized size	1	1.00	1.00	2.29	2.00	1.76	0.00	0.00	-0.03
time (sec)	N/A	0.076	0.101	1.111	0.786	0.666	0.000	0.000	0.000

Problem 426	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	63	101	80	75	0	0	84
normalized size	1	1.00	0.79	1.26	1.00	0.94	0.00	0.00	1.05
time (sec)	N/A	0.145	0.225	1.213	0.941	0.541	0.000	0.000	3.945

Problem 427	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	83	106	130	89	0	0	104
normalized size	1	1.00	0.69	0.88	1.07	0.74	0.00	0.00	0.86
time (sec)	N/A	0.209	0.309	1.234	0.958	0.504	0.000	0.000	4.160

Problem 428	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	165	165	100	132	178	100	0	0	112
normalized size	1	1.00	0.61	0.80	1.08	0.61	0.00	0.00	0.68
time (sec)	N/A	0.306	0.479	1.185	1.172	0.696	0.000	0.000	4.199

Problem 429	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	209	209	100	142	226	111	0	0	127
normalized size	1	1.00	0.48	0.68	1.08	0.53	0.00	0.00	0.61
time (sec)	N/A	0.393	0.552	1.174	1.158	0.655	0.000	0.000	4.570

Problem 430	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	411	411	370	1439	2453	541	0	0	-1
normalized size	1	1.00	0.90	3.50	5.97	1.32	0.00	0.00	-0.00
time (sec)	N/A	0.434	5.808	1.148	1.293	0.705	0.000	0.000	0.000

Problem 431	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	A	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	527	527	11295	1324	1466	543	0	0	-1
normalized size	1	1.00	21.43	2.51	2.78	1.03	0.00	0.00	-0.00
time (sec)	N/A	0.454	27.258	1.186	1.033	0.632	0.000	0.000	0.000

Problem 432	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	38	103	76	71	0	0	-1
normalized size	1	1.00	1.00	2.71	2.00	1.87	0.00	0.00	-0.03
time (sec)	N/A	0.078	0.249	1.116	0.909	0.717	0.000	0.000	0.000

Problem 433	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	63	112	86	79	0	0	102
normalized size	1	1.00	0.79	1.40	1.08	0.99	0.00	0.00	1.28
time (sec)	N/A	0.166	0.226	1.108	0.613	0.647	0.000	0.000	4.226

Problem 434	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	85	128	130	86	0	0	109
normalized size	1	1.00	0.70	1.06	1.07	0.71	0.00	0.00	0.90
time (sec)	N/A	0.220	0.332	1.168	1.117	1.507	0.000	0.000	4.217

Problem 435	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	162	162	102	140	178	89	0	0	118
normalized size	1	1.00	0.63	0.86	1.10	0.55	0.00	0.00	0.73
time (sec)	N/A	0.301	0.424	1.186	1.048	2.470	0.000	0.000	4.515

Problem 436	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	206	206	107	159	226	111	0	0	135
normalized size	1	1.00	0.52	0.77	1.10	0.54	0.00	0.00	0.66
time (sec)	N/A	0.399	0.593	1.176	0.970	0.830	0.000	0.000	4.723

Problem 437	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	118	0	0	0	0	0	-1
normalized size	1	1.00	1.37	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.211	0.713	1.159	0.000	0.606	0.000	0.000	0.000

Problem 438	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	116	0	0	0	0	0	-1
normalized size	1	1.00	1.35	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.199	0.597	1.158	0.000	0.763	0.000	0.000	0.000

Problem 439	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	116	0	0	0	0	0	-1
normalized size	1	1.00	1.36	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.190	0.463	1.402	0.000	0.814	0.000	0.000	0.000

Problem 440	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	95	0	0	0	0	0	-1
normalized size	1	1.00	1.14	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.182	0.568	1.346	0.000	0.725	0.000	0.000	0.000

Problem 441	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	95	0	0	0	0	0	-1
normalized size	1	1.00	1.14	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.196	0.811	1.365	0.000	0.737	0.000	0.000	0.000

Problem 442	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	112	0	0	0	0	0	-1
normalized size	1	1.00	1.27	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.210	0.709	1.260	0.000	0.686	0.000	0.000	0.000

Problem 443	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	437	437	240	0	3905	529	0	0	-1
normalized size	1	1.00	0.55	0.00	8.94	1.21	0.00	0.00	-0.00
time (sec)	N/A	0.398	1.832	0.809	1.746	0.964	0.000	0.000	0.000

Problem 444	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	378	378	220	0	1907	515	0	0	-1
normalized size	1	1.00	0.58	0.00	5.04	1.36	0.00	0.00	-0.00
time (sec)	N/A	0.343	1.318	0.776	0.945	0.630	0.000	0.000	0.000

Problem 445	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	340	340	161	0	1753	369	0	0	-1
normalized size	1	1.00	0.47	0.00	5.16	1.09	0.00	0.00	-0.00
time (sec)	N/A	0.171	0.670	0.738	1.097	1.681	0.000	0.000	0.000

Problem 446	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	47	0	106	54	0	0	81
normalized size	1	1.00	1.27	0.00	2.86	1.46	0.00	0.00	2.19
time (sec)	N/A	0.077	0.362	0.710	1.145	0.638	0.000	0.000	4.814

Problem 447	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	70	0	318	58	0	0	90
normalized size	1	1.00	0.86	0.00	3.93	0.72	0.00	0.00	1.11
time (sec)	N/A	0.154	0.549	0.756	1.297	0.446	0.000	0.000	4.130

Problem 448	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	100	0	402	107	0	0	122
normalized size	1	1.00	0.82	0.00	3.30	0.88	0.00	0.00	1.00
time (sec)	N/A	0.235	0.621	0.778	1.092	0.728	0.000	0.000	5.269

Problem 449	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	163	163	116	0	977	133	0	0	303
normalized size	1	1.00	0.71	0.00	5.99	0.82	0.00	0.00	1.86
time (sec)	N/A	0.321	1.147	0.772	1.081	0.684	0.000	0.000	7.879

Problem 450	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	1165	0	0	0	0	0	-1
normalized size	1	1.00	13.55	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.149	12.921	1.213	0.000	0.704	0.000	0.000	0.000

Problem 451	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	430	0	0	0	0	0	-1
normalized size	1	1.00	5.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.148	6.194	1.420	0.000	1.811	0.000	0.000	0.000

Problem 452	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	141	0	0	0	0	0	-1
normalized size	1	1.00	1.64	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.150	1.167	1.173	0.000	0.650	0.000	0.000	0.000

Problem 453	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	130	0	0	0	0	0	-1
normalized size	1	1.00	1.59	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.126	0.676	1.426	0.000	0.655	0.000	0.000	0.000

Problem 454	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	150	0	0	0	0	0	-1
normalized size	1	1.00	1.74	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.154	0.704	2.315	0.000	0.521	0.000	0.000	0.000

Problem 455	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	154	0	0	0	0	0	-1
normalized size	1	1.00	1.79	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.159	21.117	3.861	0.000	0.579	0.000	0.000	0.000

Problem 456	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	151	0	0	0	0	0	-1
normalized size	1	1.00	1.76	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.158	13.426	4.486	0.000	0.780	0.000	0.000	0.000

Problem 457	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	178	0	0	0	0	0	-1
normalized size	1	1.00	1.63	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.206	2.558	1.272	0.000	1.513	0.000	0.000	0.000

Problem 458	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	163	0	0	0	0	0	-1
normalized size	1	1.00	1.50	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.198	1.823	1.212	0.000	0.850	0.000	0.000	0.000

Problem 459	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	163	0	0	0	0	0	-1
normalized size	1	1.00	1.52	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.196	1.145	1.229	0.000	0.618	0.000	0.000	0.000

Problem 460	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	162	0	0	0	0	0	-1
normalized size	1	1.00	1.51	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.179	0.735	1.512	0.000	0.574	0.000	0.000	0.000

Problem 461	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	162	0	0	0	0	0	-1
normalized size	1	1.00	1.53	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.194	1.195	1.178	0.000	0.549	0.000	0.000	0.000

Problem 462	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	178	0	0	0	0	0	-1
normalized size	1	1.00	1.63	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.209	1.662	1.125	0.000	0.571	0.000	0.000	0.000

Problem 463	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	178	0	0	0	0	0	-1
normalized size	1	1.00	1.63	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.210	3.288	1.135	0.000	0.577	0.000	0.000	0.000

Problem 464	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	159	0	0	0	0	0	-1
normalized size	1	1.00	1.51	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.146	8.997	1.859	0.000	0.917	0.000	0.000	0.000

Problem 465	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	171	3316	0	245	0	0	168
normalized size	1	1.00	1.76	34.19	0.00	2.53	0.00	0.00	1.73
time (sec)	N/A	0.070	14.220	1.510	0.000	0.520	0.000	0.000	8.127

Problem 466	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	143	1668	0	141	0	0	216
normalized size	1	1.00	2.20	25.66	0.00	2.17	0.00	0.00	3.32
time (sec)	N/A	0.056	13.527	0.925	0.000	0.690	0.000	0.000	2.436

Problem 467	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	32	32	111	31	28	60	0	0	104
normalized size	1	1.00	3.47	0.97	0.88	1.88	0.00	0.00	3.25
time (sec)	N/A	0.046	13.047	0.131	0.384	0.698	0.000	0.000	0.416

Problem 468	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	141	0	0	0	0	0	-1
normalized size	1	1.00	2.52	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.057	13.293	4.388	0.000	1.051	0.000	0.000	0.000

Problem 469	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	60	60	143	0	0	0	0	0	-1
normalized size	1	1.00	2.38	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.055	4.437	3.677	0.000	1.479	0.000	0.000	0.000

Problem 470	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	60	60	143	0	0	0	0	0	-1
normalized size	1	1.00	2.38	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.054	5.832	3.688	0.000	0.578	0.000	0.000	0.000

Problem 471	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	149	0	0	0	0	0	-1
normalized size	1	1.00	1.59	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.187	14.007	1.050	0.000	0.469	0.000	0.000	0.000

Problem 472	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	149	0	0	0	0	0	-1
normalized size	1	1.00	1.62	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.182	13.301	1.459	0.000	0.923	0.000	0.000	0.000

Problem 473	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	134	0	0	0	0	0	-1
normalized size	1	1.00	1.52	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.149	8.353	1.230	0.000	0.491	0.000	0.000	0.000

Problem 474	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	136	0	0	0	0	0	-1
normalized size	1	1.00	1.60	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.166	12.899	1.843	0.000	0.575	0.000	0.000	0.000

Problem 475	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	149	0	0	0	0	0	-1
normalized size	1	1.00	1.59	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.189	13.569	7.958	0.000	0.647	0.000	0.000	0.000

Problem 476	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	149	0	0	0	0	0	-1
normalized size	1	1.00	1.59	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.193	6.325	6.779	0.000	0.773	0.000	0.000	0.000

Problem 477	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	156	0	0	0	0	0	-1
normalized size	1	1.00	1.62	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.202	9.056	0.852	0.000	0.647	0.000	0.000	0.000

Problem 478	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	156	0	0	0	0	0	-1
normalized size	1	1.00	1.62	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.199	8.935	0.827	0.000	0.596	0.000	0.000	0.000

Problem 479	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	156	0	0	0	0	0	-1
normalized size	1	1.00	1.66	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.175	8.543	0.870	0.000	0.577	0.000	0.000	0.000

Problem 480	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	91	91	129	0	0	0	0	0	-1
normalized size	1	1.00	1.42	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.178	9.750	0.881	0.000	0.662	0.000	0.000	0.000

Problem 481	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	129	0	0	0	0	0	-1
normalized size	1	1.00	1.39	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.208	10.337	0.866	0.000	0.770	0.000	0.000	0.000

Problem 482	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	147	0	0	0	0	0	-1
normalized size	1	1.00	1.50	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.210	10.592	0.826	0.000	0.584	0.000	0.000	0.000

Problem 483	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	269	269	165	5823	432	332	0	0	511
normalized size	1	1.00	0.61	21.65	1.61	1.23	0.00	0.00	1.90
time (sec)	N/A	0.406	0.684	2.505	1.266	1.101	0.000	0.000	9.901

Problem 484	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	205	205	119	4994	344	263	0	0	425
normalized size	1	1.00	0.58	24.36	1.68	1.28	0.00	0.00	2.07
time (sec)	N/A	0.305	0.658	2.176	1.088	0.576	0.000	0.000	9.238

Problem 485	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	148	148	82	3327	174	177	0	0	227
normalized size	1	1.00	0.55	22.48	1.18	1.20	0.00	0.00	1.53
time (sec)	N/A	0.198	0.259	1.845	0.730	0.532	0.000	0.000	9.304

Problem 486	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	58	2490	113	129	0	0	121
normalized size	1	1.00	0.62	26.49	1.20	1.37	0.00	0.00	1.29
time (sec)	N/A	0.116	0.204	1.857	1.103	0.698	0.000	0.000	1.894

Problem 487	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	37	37	37	874	86	84	0	0	-1
normalized size	1	1.00	1.00	23.62	2.32	2.27	0.00	0.00	-0.03
time (sec)	N/A	0.048	0.041	1.000	0.901	0.663	0.000	0.000	0.000

Problem 488	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-1)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	118	87	0	0	0	0	0	-1
normalized size	1	1.00	0.74	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.218	4.604	2.080	0.000	0.607	0.000	0.000	0.000

Problem 489	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-1)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	113	113	112	0	0	0	0	0	-1
normalized size	1	1.00	0.99	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.183	13.623	2.053	0.000	0.573	0.000	0.000	0.000

Problem 490	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-1)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	116	0	0	0	0	0	-1
normalized size	1	1.00	0.96	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.235	12.263	2.085	0.000	0.636	0.000	0.000	0.000

Problem 491	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	122	0	1062	165	0	0	318
normalized size	1	1.00	0.78	0.00	6.81	1.06	0.00	0.00	2.04
time (sec)	N/A	0.226	2.188	2.233	3.280	0.579	0.000	0.000	10.330

Problem 492	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	166	0	0	0	0	0	-1
normalized size	1	1.00	1.71	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.208	13.800	2.115	0.000	0.798	0.000	0.000	0.000

Problem 493	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	91	0	594	134	0	0	174
normalized size	1	1.00	0.93	0.00	6.06	1.37	0.00	0.00	1.78
time (sec)	N/A	0.132	1.241	2.039	1.263	0.676	0.000	0.000	5.934

Problem 494	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	166	0	0	0	0	0	-1
normalized size	1	1.00	1.71	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.208	11.973	2.001	0.000	0.763	0.000	0.000	0.000

Problem 495	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	59	0	217	109	0	0	106
normalized size	1	1.00	1.28	0.00	4.72	2.37	0.00	0.00	2.30
time (sec)	N/A	0.056	0.647	2.076	0.837	0.670	0.000	0.000	4.240

Problem 496	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	154	0	0	0	0	0	-1
normalized size	1	1.00	1.62	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.185	8.216	1.957	0.000	0.611	0.000	0.000	0.000

Problem 497	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	146	0	0	0	0	0	-1
normalized size	1	1.00	2.25	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.078	1.783	1.359	0.000	0.582	0.000	0.000	0.000

Problem 498	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	157	0	0	0	0	0	-1
normalized size	1	1.00	1.65	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.192	12.883	2.835	0.000	0.594	0.000	0.000	0.000

Problem 499	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	151	0	0	0	0	0	-1
normalized size	1	1.00	2.04	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.149	13.116	2.666	0.000	0.681	0.000	0.000	0.000

Problem 500	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	166	0	0	0	0	0	-1
normalized size	1	1.00	1.71	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.214	13.474	2.994	0.000	1.565	0.000	0.000	0.000

Problem 501	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	165	0	0	0	0	0	-1
normalized size	1	1.00	2.50	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.189	123.443	4.827	0.000	0.695	0.000	0.000	0.000

Problem 502	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	165	0	0	0	0	0	-1
normalized size	1	1.00	2.50	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.183	14.299	4.734	0.000	0.780	0.000	0.000	0.000

Problem 503	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	150	0	0	0	0	0	-1
normalized size	1	1.00	2.38	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.074	1.161	1.410	0.000	0.633	0.000	0.000	0.000

Problem 504	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	40	1291	137	115	0	0	62
normalized size	1	1.00	1.00	32.28	3.42	2.88	0.00	0.00	1.55
time (sec)	N/A	0.057	0.500	1.663	0.492	0.757	0.000	0.000	4.591

Problem 505	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	61	0	304	139	0	0	260
normalized size	1	1.00	0.66	0.00	3.30	1.51	0.00	0.00	2.83
time (sec)	N/A	0.128	1.166	3.617	0.676	0.973	0.000	0.000	7.823

Problem 506	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	B	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	148	148	129	0	617	171	0	0	321
normalized size	1	1.00	0.87	0.00	4.17	1.16	0.00	0.00	2.17
time (sec)	N/A	0.211	1.964	3.781	1.591	0.611	0.000	0.000	12.468

Problem 507	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	60	60	53	48	70	57	56	70	68
normalized size	1	1.00	0.88	0.80	1.17	0.95	0.93	1.17	1.13
time (sec)	N/A	0.037	0.177	0.370	0.328	1.635	4.136	0.324	3.675

Problem 508	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	68	74	86	88	0	141	175
normalized size	1	1.00	0.92	1.00	1.16	1.19	0.00	1.91	2.36
time (sec)	N/A	0.046	0.211	0.378	0.330	0.596	0.000	0.887	7.072

Problem 509	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	41	38	48	45	44	48	46
normalized size	1	1.00	0.93	0.86	1.09	1.02	1.00	1.09	1.05
time (sec)	N/A	0.032	0.086	0.365	0.329	0.702	3.114	0.602	3.586

Problem 510	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	52	54	61	74	0	99	105
normalized size	1	1.00	1.00	1.04	1.17	1.42	0.00	1.90	2.02
time (sec)	N/A	0.035	0.016	0.375	0.338	0.702	0.000	0.576	5.414

Problem 511	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	28	28	28	25	20	30	34	25	23
normalized size	1	1.00	1.00	0.89	0.71	1.07	1.21	0.89	0.82
time (sec)	N/A	0.028	0.014	0.361	0.333	0.789	2.295	0.282	3.691

Problem 512	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	24	34	31	54	37	54	38
normalized size	1	1.00	1.00	1.42	1.29	2.25	1.54	2.25	1.58
time (sec)	N/A	0.015	0.010	0.086	0.334	1.804	4.515	0.293	3.749

Problem 513	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	24	24	46	23	23	23	0	129	38
normalized size	1	1.00	1.92	0.96	0.96	0.96	0.00	5.38	1.58
time (sec)	N/A	0.020	0.021	0.237	0.326	0.678	0.000	0.212	3.718

Problem 514	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	46	41	38	35	0	146	31
normalized size	1	1.00	1.07	0.95	0.88	0.81	0.00	3.40	0.72
time (sec)	N/A	0.028	0.055	0.291	0.428	0.655	0.000	1.718	3.684

Problem 515	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	44	44	44	36	35	38	0	0	47
normalized size	1	1.00	1.00	0.82	0.80	0.86	0.00	0.00	1.07
time (sec)	N/A	0.032	0.013	0.389	0.326	0.660	0.000	0.000	3.757

Problem 516	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	62	52	61	51	0	426	41
normalized size	1	1.00	0.95	0.80	0.94	0.78	0.00	6.55	0.63
time (sec)	N/A	0.041	0.095	0.391	0.425	0.639	0.000	0.516	3.709

Problem 517	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	119	119	133	138	133	122	0	156	132
normalized size	1	1.00	1.12	1.16	1.12	1.03	0.00	1.31	1.11
time (sec)	N/A	0.107	0.576	0.406	0.335	0.680	0.000	0.816	3.676

Problem 518	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	104	110	104	100	0	118	102
normalized size	1	1.00	1.07	1.13	1.07	1.03	0.00	1.22	1.05
time (sec)	N/A	0.083	0.653	0.409	0.331	0.643	0.000	0.532	3.567

Problem 519	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	54	82	71	79	0	80	71
normalized size	1	1.00	0.72	1.09	0.95	1.05	0.00	1.07	0.95
time (sec)	N/A	0.066	0.187	0.408	0.338	0.621	0.000	0.496	3.548

Problem 520	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	A	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	46	48	20	55	0	41	39
normalized size	1	1.00	2.09	2.18	0.91	2.50	0.00	1.86	1.77
time (sec)	N/A	0.037	0.042	0.396	0.331	1.320	0.000	0.458	3.561

Problem 521	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	52	70	55	52	0	245	50
normalized size	1	1.00	1.06	1.43	1.12	1.06	0.00	5.00	1.02
time (sec)	N/A	0.053	0.126	0.297	0.427	0.570	0.000	2.056	3.583

Problem 522	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	A	F	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	216	97	85	75	0	0	83
normalized size	1	1.00	2.45	1.10	0.97	0.85	0.00	0.00	0.94
time (sec)	N/A	0.078	2.977	0.436	0.432	0.553	0.000	0.000	3.655

Problem 523	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	163	163	131	235	220	163	0	437	432
normalized size	1	1.00	0.80	1.44	1.35	1.00	0.00	2.68	2.65
time (sec)	N/A	0.132	0.791	0.448	0.345	0.753	0.000	0.597	7.099

Problem 524	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	131	104	189	180	142	0	343	328
normalized size	1	1.00	0.79	1.44	1.37	1.08	0.00	2.62	2.50
time (sec)	N/A	0.115	0.531	0.416	0.346	0.844	0.000	0.572	6.378

Problem 525	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	120	143	129	120	0	249	216
normalized size	1	1.00	1.21	1.44	1.30	1.21	0.00	2.52	2.18
time (sec)	N/A	0.099	0.060	0.418	0.330	0.633	0.000	0.574	6.242

Problem 526	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	67	98	82	96	0	122	106
normalized size	1	1.00	1.03	1.51	1.26	1.48	0.00	1.88	1.63
time (sec)	N/A	0.052	0.038	0.142	0.325	0.699	0.000	0.468	4.169

Problem 527	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	84	63	60	62	0	1316	66
normalized size	1	1.00	1.79	1.34	1.28	1.32	0.00	28.00	1.40
time (sec)	N/A	0.033	0.137	0.273	0.332	0.752	0.000	1.025	3.894

Problem 528	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	64	52	52	53	0	0	77
normalized size	1	1.00	0.71	0.58	0.58	0.59	0.00	0.00	0.86
time (sec)	N/A	0.095	0.463	0.423	0.331	0.672	0.000	0.000	3.760

Problem 529	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	114	114	116	88	77	74	0	0	115
normalized size	1	1.00	1.02	0.77	0.68	0.65	0.00	0.00	1.01
time (sec)	N/A	0.102	0.219	0.498	0.328	0.723	0.000	0.000	3.769

Problem 530	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	154	108	98	94	0	0	176
normalized size	1	1.00	1.12	0.78	0.71	0.68	0.00	0.00	1.28
time (sec)	N/A	0.107	0.437	0.500	0.331	0.619	0.000	0.000	3.841

Problem 531	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	194	194	177	219	176	150	0	220	175
normalized size	1	1.00	0.91	1.13	0.91	0.77	0.00	1.13	0.90
time (sec)	N/A	0.147	2.038	0.464	0.358	0.756	0.000	1.558	3.677

Problem 532	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	115	173	142	128	0	166	139
normalized size	1	1.00	0.83	1.25	1.03	0.93	0.00	1.20	1.01
time (sec)	N/A	0.125	0.570	0.460	0.333	0.776	0.000	2.715	3.605

Problem 533	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	75	75	54	127	98	105	0	112	97
normalized size	1	1.00	0.72	1.69	1.31	1.40	0.00	1.49	1.29
time (sec)	N/A	0.071	0.336	0.431	0.379	0.646	0.000	1.359	3.573

Problem 534	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	A	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	57	72	20	78	0	57	55
normalized size	1	1.00	2.59	3.27	0.91	3.55	0.00	2.59	2.50
time (sec)	N/A	0.036	0.158	0.431	0.343	0.820	0.000	0.962	3.569

Problem 535	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	401	123	81	79	0	601	141
normalized size	1	1.00	4.66	1.43	0.94	0.92	0.00	6.99	1.64
time (sec)	N/A	0.093	0.777	0.313	0.433	0.765	0.000	3.934	3.662

Problem 536	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	A	F	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	257	114	110	100	0	0	109
normalized size	1	1.00	3.06	1.36	1.31	1.19	0.00	0.00	1.30
time (sec)	N/A	0.069	3.581	0.471	0.436	0.689	0.000	0.000	3.797

Problem 537	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	159	177	637	328	208	170	0	465	423
normalized size	1	1.11	4.01	2.06	1.31	1.07	0.00	2.92	2.66
time (sec)	N/A	0.145	2.192	0.536	0.387	0.839	0.000	1.080	7.340

Problem 538	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	144	464	256	157	147	0	333	293
normalized size	1	1.14	3.68	2.03	1.25	1.17	0.00	2.64	2.33
time (sec)	N/A	0.130	1.305	0.534	0.379	0.702	0.000	2.615	7.325

Problem 539	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	91	109	293	187	111	123	0	171	160
normalized size	1	1.20	3.22	2.05	1.22	1.35	0.00	1.88	1.76
time (sec)	N/A	0.085	1.591	0.295	0.367	0.712	0.000	4.308	5.535

Problem 540	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	102	131	126	84	109	0	0	116
normalized size	1	1.21	1.56	1.50	1.00	1.30	0.00	0.00	1.38
time (sec)	N/A	0.080	1.053	0.372	0.357	0.767	0.000	0.000	4.251

Problem 541	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	81	75	77	77	0	0	104
normalized size	1	1.00	1.16	1.07	1.10	1.10	0.00	0.00	1.49
time (sec)	N/A	0.069	0.375	0.489	0.353	1.537	0.000	0.000	3.706

Problem 542	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	150	125	107	102	0	0	147
normalized size	1	1.00	1.43	1.19	1.02	0.97	0.00	0.00	1.40
time (sec)	N/A	0.095	0.707	0.562	0.362	0.664	0.000	0.000	3.810

Problem 543	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	142	204	145	126	123	0	0	214
normalized size	1	1.00	1.44	1.02	0.89	0.87	0.00	0.00	1.51
time (sec)	N/A	0.152	1.068	0.569	0.355	0.959	0.000	0.000	3.944

Problem 544	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	99	162	108	183	0	120	119
normalized size	1	1.00	0.85	1.40	0.93	1.58	0.00	1.03	1.03
time (sec)	N/A	0.102	1.179	0.464	0.339	0.597	0.000	0.832	3.730

Problem 545	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	52	72	53	117	0	54	57
normalized size	1	1.00	0.88	1.22	0.90	1.98	0.00	0.92	0.97
time (sec)	N/A	0.065	0.139	0.434	0.331	0.830	0.000	0.766	3.590

Problem 546	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	19	18	59	0	19	18
normalized size	1	1.00	1.00	1.06	1.00	3.28	0.00	1.06	1.00
time (sec)	N/A	0.042	0.017	0.326	0.338	0.536	0.000	0.706	3.585

Problem 547	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	143	236	141	119	0	182	156
normalized size	1	1.00	1.54	2.54	1.52	1.28	0.00	1.96	1.68
time (sec)	N/A	0.136	0.235	0.563	0.466	0.463	0.000	1.109	3.901

Problem 548	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	218	524	271	208	0	322	318
normalized size	1	1.00	1.43	3.45	1.78	1.37	0.00	2.12	2.09
time (sec)	N/A	0.197	0.406	0.543	0.468	1.000	0.000	1.633	4.199

Problem 549	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	A	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	140	152	321	488	361	259	0	278	724
normalized size	1	1.09	2.29	3.49	2.58	1.85	0.00	1.99	5.17
time (sec)	N/A	0.198	2.005	0.473	0.452	1.887	0.000	0.808	5.401

Problem 550	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	79	109	174	163	191	0	136	310
normalized size	1	1.00	1.38	2.20	2.06	2.42	0.00	1.72	3.92
time (sec)	N/A	0.094	0.160	0.449	0.437	0.776	0.000	1.529	3.872

Problem 551	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	46	46	45	43	80	131	0	74	39
normalized size	1	1.00	0.98	0.93	1.74	2.85	0.00	1.61	0.85
time (sec)	N/A	0.031	0.045	0.243	0.433	0.617	0.000	0.613	3.752

Problem 552	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	79	90	142	187	0	118	110
normalized size	1	1.00	0.88	1.00	1.58	2.08	0.00	1.31	1.22
time (sec)	N/A	0.101	0.311	0.536	0.436	0.705	0.000	1.196	3.837

Problem 553	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	165	165	137	221	379	262	0	286	342
normalized size	1	1.00	0.83	1.34	2.30	1.59	0.00	1.73	2.07
time (sec)	N/A	0.194	1.235	0.541	0.475	0.776	0.000	2.798	6.339

Problem 554	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	178	178	229	305	186	386	0	253	258
normalized size	1	1.00	1.29	1.71	1.04	2.17	0.00	1.42	1.45
time (sec)	N/A	0.152	2.372	0.489	0.353	0.857	0.000	4.957	3.633

Problem 555	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	122	174	115	281	0	149	130
normalized size	1	1.00	1.05	1.50	0.99	2.42	0.00	1.28	1.12
time (sec)	N/A	0.097	2.787	0.465	0.330	0.715	0.000	1.582	3.714

Problem 556	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	51	78	60	178	0	71	67
normalized size	1	1.00	0.84	1.28	0.98	2.92	0.00	1.16	1.10
time (sec)	N/A	0.066	0.070	0.475	0.326	0.595	0.000	5.249	3.715

Problem 557	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	32	21	20	57	0	20	20
normalized size	1	1.00	1.60	1.05	1.00	2.85	0.00	1.00	1.00
time (sec)	N/A	0.039	0.048	0.333	0.325	0.719	0.000	4.899	3.653

Problem 558	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	304	292	282	279	0	250	246
normalized size	1	1.00	2.00	1.92	1.86	1.84	0.00	1.64	1.62
time (sec)	N/A	0.163	3.942	0.470	0.438	0.575	0.000	1.269	3.928

Problem 559	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	235	235	416	661	502	424	0	464	463
normalized size	1	1.00	1.77	2.81	2.14	1.80	0.00	1.97	1.97
time (sec)	N/A	0.266	3.328	0.477	0.445	0.684	0.000	2.633	4.770

Problem 560	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	235	235	1152	989	827	472	0	530	2654
normalized size	1	1.00	4.90	4.21	3.52	2.01	0.00	2.26	11.29
time (sec)	N/A	0.268	6.225	0.476	0.633	1.063	0.000	5.885	6.545

Problem 561	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	176	176	709	440	471	355	0	280	585
normalized size	1	1.00	4.03	2.50	2.68	2.02	0.00	1.59	3.32
time (sec)	N/A	0.168	6.134	0.452	0.481	1.038	0.000	2.926	5.013

Problem 562	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	91	132	120	174	212	293	0	166	383
normalized size	1	1.45	1.32	1.91	2.33	3.22	0.00	1.82	4.21
time (sec)	N/A	0.107	0.811	0.471	0.455	0.576	0.000	1.928	4.188

Problem 563	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	105	78	118	182	215	0	138	136
normalized size	1	1.28	0.95	1.44	2.22	2.62	0.00	1.68	1.66
time (sec)	N/A	0.073	0.378	0.256	0.691	0.669	0.000	2.938	3.984

Problem 564	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	157	157	153	172	348	302	0	286	286
normalized size	1	1.00	0.97	1.10	2.22	1.92	0.00	1.82	1.82
time (sec)	N/A	0.127	0.558	0.496	0.512	0.674	0.000	3.731	5.952

Problem 565	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F(-1)	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	241	241	249	320	772	418	0	438	674
normalized size	1	1.00	1.03	1.33	3.20	1.73	0.00	1.82	2.80
time (sec)	N/A	0.258	1.178	0.518	0.624	0.623	0.000	7.026	7.108

Problem 566	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	185	185	272	321	200	476	0	243	234
normalized size	1	1.00	1.47	1.74	1.08	2.57	0.00	1.31	1.26
time (sec)	N/A	0.156	1.380	0.526	0.493	2.185	0.000	1.618	3.677

Problem 567	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	140	184	128	354	0	140	143
normalized size	1	1.00	1.16	1.52	1.06	2.93	0.00	1.16	1.18
time (sec)	N/A	0.102	3.483	0.503	0.438	0.806	0.000	2.036	3.731

Problem 568	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	57	84	78	284	0	62	80
normalized size	1	1.00	0.83	1.22	1.13	4.12	0.00	0.90	1.16
time (sec)	N/A	0.073	0.105	0.512	0.350	1.079	0.000	2.846	3.747

Problem 569	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	A	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	22	22	58	21	20	142	0	20	39
normalized size	1	1.00	2.64	0.95	0.91	6.45	0.00	0.91	1.77
time (sec)	N/A	0.043	0.187	0.339	0.319	0.680	0.000	0.887	3.663

Problem 570	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	B	F(-2)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	202	202	458	453	458	503	0	439	419
normalized size	1	1.00	2.27	2.24	2.27	2.49	0.00	2.17	2.07
time (sec)	N/A	0.233	6.283	0.522	0.465	1.123	0.000	1.144	4.564

Problem 571	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	B	F(-2)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	295	295	596	824	738	671	0	587	715
normalized size	1	1.00	2.02	2.79	2.50	2.27	0.00	1.99	2.42
time (sec)	N/A	0.349	6.290	0.571	0.459	0.876	0.000	1.326	5.434

Problem 572	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	239	239	688	1125	902	564	0	510	1203
normalized size	1	1.00	2.88	4.71	3.77	2.36	0.00	2.13	5.03
time (sec)	N/A	0.243	2.476	0.516	0.748	0.855	0.000	1.603	6.937

Problem 573	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	B	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	148	189	396	611	518	513	0	314	1311
normalized size	1	1.28	2.68	4.13	3.50	3.47	0.00	2.12	8.86
time (sec)	N/A	0.160	2.452	0.495	0.450	0.714	0.000	3.694	5.680

Problem 574	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	118	132	191	326	294	0	221	260
normalized size	1	1.24	1.39	2.01	3.43	3.09	0.00	2.33	2.74
time (sec)	N/A	0.092	0.304	0.533	0.448	0.502	0.000	1.739	5.880

Problem 575	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	F	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	155	155	110	280	412	352	0	293	443
normalized size	1	1.00	0.71	1.81	2.66	2.27	0.00	1.89	2.86
time (sec)	N/A	0.114	0.968	0.270	0.454	0.833	0.000	3.190	4.822

Problem 576	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	221	221	183	283	658	480	0	399	610
normalized size	1	1.00	0.83	1.28	2.98	2.17	0.00	1.81	2.76
time (sec)	N/A	0.214	1.933	0.531	0.469	0.793	0.000	2.752	7.324

Problem 577	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	B	F(-1)	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	310	310	371	457	1229	619	0	640	1128
normalized size	1	1.00	1.20	1.47	3.96	2.00	0.00	2.06	3.64
time (sec)	N/A	0.385	1.995	0.558	0.542	0.844	0.000	4.345	8.827

Problem 578	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	121	121	69	371	0	0	0	0	-1
normalized size	1	1.00	0.57	3.07	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.093	0.620	0.922	0.000	0.692	0.000	0.000	0.000

Problem 579	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	58	195	0	0	0	0	-1
normalized size	1	1.00	0.63	2.12	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.069	0.411	0.831	0.000	0.725	0.000	0.000	0.000

Problem 580	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	58	356	0	0	0	0	-1
normalized size	1	1.00	0.66	4.05	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.069	0.295	0.796	0.000	0.648	0.000	0.000	0.000

Problem 581	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	42	168	0	0	0	0	39
normalized size	1	1.00	0.72	2.90	0.00	0.00	0.00	0.00	0.67
time (sec)	N/A	0.047	0.200	0.893	0.000	0.614	0.000	0.000	0.363

Problem 582	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	54	916	0	0	0	0	-1
normalized size	1	1.00	0.93	15.79	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.049	0.288	0.915	0.000	1.436	0.000	0.000	0.000

Problem 583	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	69	172	0	0	0	0	-1
normalized size	1	1.00	0.73	1.83	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.069	0.202	0.777	0.000	0.568	0.000	0.000	0.000

Problem 584	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	74	345	0	0	0	0	-1
normalized size	1	1.00	0.79	3.67	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.070	0.605	0.811	0.000	0.978	0.000	0.000	0.000

Problem 585	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	123	123	94	190	0	0	0	0	-1
normalized size	1	1.00	0.76	1.54	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.091	0.351	0.822	0.000	2.470	0.000	0.000	0.000

Problem 586	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	143	143	127	382	0	0	0	0	-1
normalized size	1	1.00	0.89	2.67	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.160	0.778	0.953	0.000	1.049	0.000	0.000	0.000

Problem 587	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	143	143	126	712	0	0	0	0	-1
normalized size	1	1.00	0.88	4.98	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.163	0.651	0.914	0.000	0.598	0.000	0.000	0.000

Problem 588	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	87	339	0	0	0	0	-1
normalized size	1	1.00	0.84	3.29	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.123	0.633	0.904	0.000	0.555	0.000	0.000	0.000

Problem 589	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	95	95	64	2564	0	0	0	0	-1
normalized size	1	1.00	0.67	26.99	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.126	0.932	0.973	0.000	0.833	0.000	0.000	0.000

Problem 590	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	139	139	101	320	0	0	0	0	-1
normalized size	1	1.00	0.73	2.30	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.162	0.535	0.877	0.000	0.576	0.000	0.000	0.000

Problem 591	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	145	145	92	670	0	0	0	0	-1
normalized size	1	1.00	0.63	4.62	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.166	0.921	0.883	0.000	0.700	0.000	0.000	0.000

Problem 592	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	184	184	127	359	0	0	0	0	-1
normalized size	1	1.00	0.69	1.95	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.192	2.255	0.957	0.000	0.442	0.000	0.000	0.000

Problem 593	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	184	184	126	697	0	0	0	0	-1
normalized size	1	1.00	0.68	3.79	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.192	2.818	1.000	0.000	0.603	0.000	0.000	0.000

Problem 594	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	198	198	157	414	0	0	0	0	-1
normalized size	1	1.00	0.79	2.09	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.154	1.696	1.047	0.000	0.785	0.000	0.000	0.000

Problem 595	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	176	176	155	759	0	0	0	0	-1
normalized size	1	1.00	0.88	4.31	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.146	1.788	1.010	0.000	1.277	0.000	0.000	0.000

Problem 596	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	132	373	0	0	0	0	-1
normalized size	1	1.00	1.02	2.89	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.112	2.053	1.004	0.000	0.585	0.000	0.000	0.000

Problem 597	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	178	178	130	3065	0	0	0	0	-1
normalized size	1	1.00	0.73	17.22	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.141	1.924	1.076	0.000	0.767	0.000	0.000	0.000

Problem 598	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	146	146	117	342	0	0	0	0	-1
normalized size	1	1.00	0.80	2.34	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.124	1.321	1.000	0.000	0.572	0.000	0.000	0.000

Problem 599	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	204	204	150	1923	0	0	0	0	-1
normalized size	1	1.00	0.74	9.43	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.157	1.447	0.974	0.000	0.654	0.000	0.000	0.000

Problem 600	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	170	170	150	391	0	0	0	0	-1
normalized size	1	1.00	0.88	2.30	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.143	2.603	0.982	0.000	2.376	0.000	0.000	0.000

Problem 601	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F(-1)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	176	176	372	745	0	0	0	0	-1
normalized size	1	1.00	2.11	4.23	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.139	6.396	1.107	0.000	0.767	0.000	0.000	0.000

Problem 602	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	218	218	296	430	0	0	0	0	-1
normalized size	1	1.00	1.36	1.97	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.167	6.461	1.098	0.000	1.073	0.000	0.000	0.000

Problem 603	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	F	F(-1)	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	456	456	7284	26371	0	0	0	0	-1
normalized size	1	1.00	15.97	57.83	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.408	29.531	1.790	0.000	0.000	0.000	0.000	0.000

Problem 604	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	B	F	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	396	396	6607	10704	0	0	0	0	-1
normalized size	1	1.00	16.68	27.03	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.384	25.033	1.525	0.000	0.000	0.000	0.000	0.000

Problem 605	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	334	334	6301	3737	0	0	0	0	-1
normalized size	1	1.00	18.87	11.19	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.294	21.938	1.363	0.000	0.000	0.000	0.000	0.000

Problem 606	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	324	324	4648	3131	0	0	0	0	-1
normalized size	1	1.00	14.35	9.66	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.301	24.408	1.421	0.000	0.000	0.000	0.000	0.000

Problem 607	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	451	451	4693	8825	0	0	0	0	-1
normalized size	1	1.00	10.41	19.57	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.423	31.106	1.618	0.000	0.000	0.000	0.000	0.000

Problem 608	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	422	422	9313	6252	0	0	0	0	-1
normalized size	1	1.00	22.07	14.82	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.432	27.433	1.482	0.000	0.000	0.000	0.000	0.000

Problem 609	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	568	568	17838	14547	0	0	0	0	-1
normalized size	1	1.00	31.40	25.61	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.609	33.641	1.759	0.000	0.000	0.000	0.000	0.000

Problem 610	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-1)	F(-2)	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	480	480	1129	44463	0	0	0	0	-1
normalized size	1	1.00	2.35	92.63	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.382	23.254	5.059	0.000	0.000	0.000	0.000	0.000

Problem 611	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-1)	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	440	440	3091	5337	0	0	0	0	-1
normalized size	1	1.00	7.02	12.13	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.395	22.050	1.873	0.000	0.000	0.000	0.000	0.000

Problem 612	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-1)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	477	477	6560	25422	0	0	0	0	-1
normalized size	1	1.00	13.75	53.30	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.385	30.996	2.121	0.000	0.000	0.000	0.000	0.000

Problem 613	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	430	430	8876	14318	0	0	0	0	-1
normalized size	1	1.00	20.64	33.30	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.380	26.918	2.079	0.000	0.000	0.000	0.000	0.000

Problem 614	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	555	555	17812	38644	0	0	0	0	-1
normalized size	1	1.00	32.09	69.63	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.537	33.442	3.717	0.000	0.000	0.000	0.000	0.000

Problem 615	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	520	520	11962	15455	0	0	0	0	-1
normalized size	1	1.00	23.00	29.72	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.566	28.015	2.243	0.000	0.000	0.000	0.000	0.000

Problem 616	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	700	700	18542	44337	0	0	0	0	-1
normalized size	1	1.00	26.49	63.34	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.714	32.971	4.164	0.000	0.000	0.000	0.000	0.000

Problem 617	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-1)	F(-1)	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	583	583	14225	101372	0	0	0	0	-1
normalized size	1	1.00	24.40	173.88	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.517	29.498	7.563	0.000	0.000	0.000	0.000	0.000

Problem 618	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-1)	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	532	532	4498	45973	0	0	0	0	-1
normalized size	1	1.00	8.45	86.42	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.498	26.393	3.945	0.000	0.000	0.000	0.000	0.000

Problem 619	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-1)	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	566	566	14364	80250	0	0	0	0	-1
normalized size	1	1.00	25.38	141.78	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.539	29.641	5.161	0.000	0.000	0.000	0.000	0.000

Problem 620	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-1)	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	515	515	4455	82035	0	0	0	0	-1
normalized size	1	1.00	8.65	159.29	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.522	26.247	5.528	0.000	0.000	0.000	0.000	0.000

Problem 621	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-1)	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	664	664	14652	100402	0	0	0	0	-1
normalized size	1	1.00	22.07	151.21	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.761	30.068	14.397	0.000	0.000	0.000	0.000	0.000

Problem 622	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-1)	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	620	620	4709	82289	0	0	0	0	-1
normalized size	1	1.00	7.60	132.72	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.759	25.826	5.668	0.000	0.000	0.000	0.000	0.000

Problem 623	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-1)	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	814	814	15481	114399	0	0	0	0	-1
normalized size	1	1.00	19.02	140.54	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.915	29.673	7.742	0.000	0.000	0.000	0.000	0.000

Problem 624	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	126	0	0	0	0	0	-1
normalized size	1	1.00	1.62	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.064	0.511	0.583	0.000	0.990	0.000	0.000	0.000

Problem 625	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	58	0	0	0	0	0	-1
normalized size	1	1.00	0.76	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.060	0.181	0.578	0.000	0.950	0.000	0.000	0.000

Problem 626	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	119	0	0	0	0	0	-1
normalized size	1	1.00	1.57	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.060	0.934	0.584	0.000	0.817	0.000	0.000	0.000

Problem 627	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	94	0	0	0	0	0	-1
normalized size	1	1.00	1.21	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.064	0.431	0.515	0.000	0.579	0.000	0.000	0.000

Problem 628	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	119	119	108	0	0	0	0	0	-1
normalized size	1	1.00	0.91	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.152	1.710	0.676	0.000	0.495	0.000	0.000	0.000

Problem 629	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	119	119	83	0	0	0	0	0	-1
normalized size	1	1.00	0.70	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.136	0.477	0.633	0.000	0.457	0.000	0.000	0.000

Problem 630	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	119	119	209	0	0	0	0	0	-1
normalized size	1	1.00	1.76	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.143	3.941	0.593	0.000	0.469	0.000	0.000	0.000

Problem 631	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	119	119	119	0	0	0	0	0	-1
normalized size	1	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.154	0.522	0.596	0.000	0.499	0.000	0.000	0.000

Problem 632	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	552	552	276	0	0	0	0	0	-1
normalized size	1	1.00	0.50	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.849	6.036	1.114	0.000	0.000	0.000	0.000	0.000

Problem 633	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	552	552	280	0	0	0	0	0	-1
normalized size	1	1.00	0.51	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.769	4.576	1.097	0.000	0.000	0.000	0.000	0.000

Problem 634	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	579	579	285	0	0	0	0	0	-1
normalized size	1	1.00	0.49	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.850	21.637	1.084	0.000	0.000	0.000	0.000	0.000

Problem 635	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	581	581	6862	0	0	0	0	0	-1
normalized size	1	1.00	11.81	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.819	32.118	1.071	0.000	0.000	0.000	0.000	0.000

Problem 636	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-1)	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	687	687	3398	0	0	0	0	0	-1
normalized size	1	1.00	4.95	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.944	39.521	1.375	0.000	0.000	0.000	0.000	0.000

Problem 637	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	687	687	4485	0	0	0	0	0	-1
normalized size	1	1.00	6.53	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.884	25.724	1.372	0.000	0.000	0.000	0.000	0.000

Problem 638	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	715	715	9626	0	0	0	0	0	-1
normalized size	1	1.00	13.46	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.994	51.983	1.375	0.000	0.000	0.000	0.000	0.000

Problem 639	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F(-1)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	717	717	5235	0	0	0	0	0	-1
normalized size	1	1.00	7.30	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.969	27.842	1.397	0.000	0.000	0.000	0.000	0.000

Problem 640	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	173	167	334	0	0	0	0	0	-1
normalized size	1	0.97	1.93	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.197	6.446	1.421	0.000	0.600	0.000	0.000	0.000

Problem 641	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	147	147	11095	0	0	0	0	0	-1
normalized size	1	1.00	75.48	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.166	26.497	1.045	0.000	0.585	0.000	0.000	0.000

Problem 642	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	3302	0	0	0	0	0	-1
normalized size	1	1.00	35.51	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.062	16.803	1.597	0.000	0.484	0.000	0.000	0.000

Problem 643	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	141	141	1158	0	0	0	0	0	-1
normalized size	1	1.00	8.21	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.157	15.055	1.262	0.000	0.590	0.000	0.000	0.000

Problem 644	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	227	227	2453	0	0	0	0	0	-1
normalized size	1	1.00	10.81	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.198	18.520	1.344	0.000	0.660	0.000	0.000	0.000

Problem 645	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	NO	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	181	187	699	0	0	0	0	0	-1
normalized size	1	1.03	3.86	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.168	6.551	0.926	0.000	0.648	0.000	0.000	0.000

Problem 646	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	161	161	161	0	286	420	0	0	-1
normalized size	1	1.00	1.00	0.00	1.78	2.61	0.00	0.00	-0.01
time (sec)	N/A	0.123	3.030	0.873	0.340	0.747	0.000	0.000	0.000

Problem 647	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	71	0	116	176	0	0	-1
normalized size	1	1.00	0.81	0.00	1.32	2.00	0.00	0.00	-0.01
time (sec)	N/A	0.076	0.240	0.703	0.388	0.891	0.000	0.000	0.000

Problem 648	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	26	26	26	27	26	64	0	0	51
normalized size	1	1.00	1.00	1.04	1.00	2.46	0.00	0.00	1.96
time (sec)	N/A	0.044	0.185	0.146	0.447	0.452	0.000	0.000	4.307

Problem 649	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	272	272	225	0	0	0	0	0	-1
normalized size	1	1.00	0.83	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.457	1.267	1.178	0.000	0.501	0.000	0.000	0.000

Problem 650	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	434	434	360	0	0	0	0	0	-1
normalized size	1	1.00	0.83	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.687	4.575	1.278	0.000	0.567	0.000	0.000	0.000

Problem 651	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	159	159	306	0	0	0	0	0	-1
normalized size	1	1.00	1.92	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.164	4.038	0.665	0.000	0.704	0.000	0.000	0.000

Problem 652	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	159	159	340	0	0	0	0	0	-1
normalized size	1	1.00	2.14	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.113	3.875	0.928	0.000	0.431	0.000	0.000	0.000

Problem 653	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	161	161	341	0	0	0	0	0	-1
normalized size	1	1.00	2.12	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.125	4.952	0.535	0.000	0.428	0.000	0.000	0.000

Problem 654	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	161	161	341	0	0	0	0	0	-1
normalized size	1	1.00	2.12	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.134	6.377	2.066	0.000	0.536	0.000	0.000	0.000

Problem 655	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	133	241	0	0	0	0	-1
normalized size	1	1.00	1.07	1.94	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.135	0.683	5.634	0.000	0.504	0.000	0.000	0.000

Problem 656	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	387	205	0	0	0	0	-1
normalized size	1	1.00	4.30	2.28	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.111	12.366	5.931	0.000	0.471	0.000	0.000	0.000

Problem 657	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	100	168	0	0	0	0	-1
normalized size	1	1.00	1.11	1.87	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.109	0.362	5.774	0.000	0.443	0.000	0.000	0.000

Problem 658	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	60	60	244	108	0	0	0	0	-1
normalized size	1	1.00	4.07	1.80	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.078	0.710	3.523	0.000	0.461	0.000	0.000	0.000

Problem 659	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F	F	F	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	60	60	143	94	0	0	0	0	74
normalized size	1	1.00	2.38	1.57	0.00	0.00	0.00	0.00	1.23
time (sec)	N/A	0.079	1.029	5.988	0.000	0.508	0.000	0.000	0.558

Problem 660	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	89	92	369	214	0	0	0	0	-1
normalized size	1	1.03	4.15	2.40	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.105	3.787	7.897	0.000	0.499	0.000	0.000	0.000

Problem 661	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	57	283	0	0	0	0	-1
normalized size	1	1.00	0.59	2.95	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.104	0.523	10.038	0.000	0.556	0.000	0.000	0.000

Problem 662	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	130	130	390	396	0	0	0	0	-1
normalized size	1	1.00	3.00	3.05	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.127	6.332	16.457	0.000	0.458	0.000	0.000	0.000

Problem 663	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	190	190	156	387	0	0	0	0	-1
normalized size	1	1.00	0.82	2.04	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.221	1.245	6.931	0.000	0.534	0.000	0.000	0.000

Problem 664	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	154	154	471	351	0	0	0	0	-1
normalized size	1	1.00	3.06	2.28	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.191	3.051	6.577	0.000	0.478	0.000	0.000	0.000

Problem 665	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	154	154	131	315	0	0	0	0	-1
normalized size	1	1.00	0.85	2.05	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.198	0.679	6.105	0.000	0.515	0.000	0.000	0.000

Problem 666	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	126	420	277	0	0	0	0	-1
normalized size	1	1.05	3.50	2.31	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.167	1.716	5.947	0.000	0.473	0.000	0.000	0.000

Problem 667	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	126	158	240	0	0	0	0	-1
normalized size	1	1.05	1.32	2.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.158	0.608	6.025	0.000	0.537	0.000	0.000	0.000

Problem 668	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	244	207	0	0	0	0	-1
normalized size	1	1.00	2.65	2.25	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.154	0.686	5.715	0.000	0.421	0.000	0.000	0.000

Problem 669	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	116	170	0	0	0	0	-1
normalized size	1	1.00	1.26	1.85	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.150	0.389	5.382	0.000	0.518	0.000	0.000	0.000

Problem 670	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	255	135	0	0	0	0	-1
normalized size	1	1.00	2.09	1.11	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.171	0.952	4.533	0.000	0.463	0.000	0.000	0.000

Problem 671	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	67	208	0	0	0	0	-1
normalized size	1	1.00	0.53	1.65	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.172	0.373	7.144	0.000	0.456	0.000	0.000	0.000

Problem 672	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	164	164	406	321	0	0	0	0	-1
normalized size	1	1.00	2.48	1.96	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.191	5.687	11.392	0.000	0.619	0.000	0.000	0.000

Problem 673	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	179	179	80	97	202	100	0	0	96
normalized size	1	1.00	0.45	0.54	1.13	0.56	0.00	0.00	0.54
time (sec)	N/A	0.383	0.601	1.497	0.654	0.699	0.000	0.000	5.173

Problem 674	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	132	132	63	80	148	86	0	0	84
normalized size	1	1.00	0.48	0.61	1.12	0.65	0.00	0.00	0.64
time (sec)	N/A	0.288	0.359	1.444	0.824	0.477	0.000	0.000	0.772

Problem 675	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F(-2)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	86	56	70	59	68	0	0	88
normalized size	1	1.01	0.66	0.82	0.69	0.80	0.00	0.00	1.04
time (sec)	N/A	0.212	0.223	1.439	0.845	0.415	0.000	0.000	0.533

Problem 676	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	36	45	76	52	0	0	-1
normalized size	1	1.00	1.00	1.25	2.11	1.44	0.00	0.00	-0.03
time (sec)	N/A	0.129	0.169	1.378	0.786	0.411	0.000	0.000	0.000

Problem 677	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	335	335	125	226	1400	313	0	0	-1
normalized size	1	1.00	0.37	0.67	4.18	0.93	0.00	0.00	-0.00
time (sec)	N/A	0.214	0.892	1.541	0.876	0.485	0.000	0.000	0.000

Problem 678	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	524	620	274	308	1834	470	0	0	-1
normalized size	1	1.18	0.52	0.59	3.50	0.90	0.00	0.00	-0.00
time (sec)	N/A	0.590	3.849	1.528	1.402	0.556	0.000	0.000	0.000

Problem 679	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	512	512	227	366	2265	569	0	0	-1
normalized size	1	1.00	0.44	0.71	4.42	1.11	0.00	0.00	-0.00
time (sec)	N/A	0.564	2.421	1.553	1.268	0.714	0.000	0.000	0.000

Problem 680	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	719	719	305	417	2671	657	0	0	-1
normalized size	1	1.00	0.42	0.58	3.71	0.91	0.00	0.00	-0.00
time (sec)	N/A	0.860	2.957	1.487	1.447	0.477	0.000	0.000	0.000

Problem 681	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	175	175	80	110	202	103	0	0	110
normalized size	1	1.00	0.46	0.63	1.15	0.59	0.00	0.00	0.63
time (sec)	N/A	0.378	0.651	1.391	1.418	0.490	0.000	0.000	5.239

Problem 682	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	63	100	136	83	0	0	100
normalized size	1	1.00	0.50	0.79	1.08	0.66	0.00	0.00	0.79
time (sec)	N/A	0.313	0.379	1.520	1.194	0.546	0.000	0.000	1.129

Problem 683	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	48	74	80	68	0	0	82
normalized size	1	1.00	0.60	0.92	1.00	0.85	0.00	0.00	1.02
time (sec)	N/A	0.209	0.204	1.379	0.994	0.516	0.000	0.000	0.731

Problem 684	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	36	36	36	69	76	58	0	0	-1
normalized size	1	1.00	1.00	1.92	2.11	1.61	0.00	0.00	-0.03
time (sec)	N/A	0.139	0.188	1.434	0.648	0.582	0.000	0.000	0.000

Problem 685	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	495	495	209	232	714	341	0	0	-1
normalized size	1	1.00	0.42	0.47	1.44	0.69	0.00	0.00	-0.00
time (sec)	N/A	0.332	9.908	1.402	1.484	0.442	0.000	0.000	0.000

Problem 686	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	470	470	250	313	2168	502	0	0	-1
normalized size	1	1.00	0.53	0.67	4.61	1.07	0.00	0.00	-0.00
time (sec)	N/A	0.441	1.766	1.518	0.849	0.466	0.000	0.000	0.000

Problem 687	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	682	682	245	371	2264	604	0	0	-1
normalized size	1	1.00	0.36	0.54	3.32	0.89	0.00	0.00	-0.00
time (sec)	N/A	0.778	1.536	1.515	1.546	0.552	0.000	0.000	0.000

Problem 688	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	192	0	0	0	0	0	-1
normalized size	1	1.00	1.83	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.231	13.321	2.065	0.000	0.530	0.000	0.000	0.000

Problem 689	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	125	0	0	0	0	0	-1
normalized size	1	1.00	1.45	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.219	1.694	1.541	0.000	0.490	0.000	0.000	0.000

Problem 690	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	131	0	0	0	0	0	-1
normalized size	1	1.00	1.60	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.175	8.101	1.601	0.000	0.484	0.000	0.000	0.000

Problem 691	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	147	0	0	0	0	0	-1
normalized size	1	1.00	1.71	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.238	60.048	2.385	0.000	0.481	0.000	0.000	0.000

Problem 692	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	154	0	0	0	0	0	-1
normalized size	1	1.00	1.79	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.237	71.087	4.938	0.000	0.610	0.000	0.000	0.000

Problem 693	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	106	0	0	0	0	0	-1
normalized size	1	1.00	1.01	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.286	0.875	1.468	0.000	0.555	0.000	0.000	0.000

Problem 694	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	143	0	0	0	0	0	-1
normalized size	1	1.00	1.38	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.290	15.631	1.395	0.000	0.459	0.000	0.000	0.000

Problem 695	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	175	212	0	0	0	0	0	-1
normalized size	1	0.96	1.16	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.285	3.156	1.703	0.000	0.446	0.000	0.000	0.000

Problem 696	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	155	155	330	0	0	0	0	0	-1
normalized size	1	1.00	2.13	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.238	3.750	1.263	0.000	0.441	0.000	0.000	0.000

Problem 697	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	90	91	203	0	0	0	0	0	-1
normalized size	1	1.01	2.26	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.100	1.051	1.691	0.000	0.480	0.000	0.000	0.000

Problem 698	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	140	140	1132	0	0	0	0	0	-1
normalized size	1	1.00	8.09	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.211	14.247	1.217	0.000	0.451	0.000	0.000	0.000

Problem 699	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	227	227	2502	0	0	0	0	0	-1
normalized size	1	1.00	11.02	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.277	17.737	1.694	0.000	0.490	0.000	0.000	0.000

Problem 700	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	187	187	698	0	0	0	0	0	-1
normalized size	1	1.00	3.73	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.203	23.158	0.824	0.000	0.540	0.000	0.000	0.000

2.3 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is given. The larger this ratio is, the harder the integral was to solve. In this test, problem number [616] had the largest ratio of [.6800]

Table 2.1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	3	2	1.00	22	0.091
2	A	3	2	1.00	22	0.091
3	A	3	2	1.00	22	0.091
4	A	3	2	1.00	22	0.091
5	A	3	3	1.11	22	0.136
6	A	2	1	1.00	13	0.077
7	A	3	3	1.00	22	0.136
8	A	4	3	1.00	22	0.136
9	A	5	3	1.00	22	0.136
10	A	6	3	1.00	22	0.136
11	A	5	3	1.00	22	0.136
12	A	4	3	1.00	22	0.136
13	A	3	3	1.00	22	0.136
14	A	2	2	1.00	20	0.100
15	A	2	2	1.00	20	0.100
16	A	3	2	1.00	22	0.091
17	A	3	2	1.00	22	0.091
18	A	3	2	1.00	22	0.091
19	A	3	2	1.00	24	0.083
20	A	3	2	1.00	24	0.083
21	A	3	2	1.00	24	0.083
22	A	2	2	1.00	24	0.083
23	A	2	2	1.00	15	0.133
24	A	2	2	1.00	24	0.083
25	A	4	3	1.00	24	0.125
26	A	4	3	1.00	24	0.125
27	A	4	3	1.00	24	0.125
28	A	5	4	1.00	24	0.167
29	A	4	4	1.00	24	0.167
30	A	3	3	1.00	22	0.136
31	A	2	2	1.00	22	0.091
32	A	2	2	1.00	24	0.083
33	A	3	2	1.00	24	0.083
34	A	3	2	1.00	24	0.083
35	A	3	2	1.00	24	0.083

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
36	A	3	2	1.00	24	0.083
37	A	3	2	1.00	24	0.083
38	A	3	2	1.00	24	0.083
39	A	2	2	1.00	24	0.083
40	A	3	3	1.00	15	0.200
41	A	3	2	1.00	24	0.083
42	A	2	2	1.00	24	0.083
43	A	4	3	1.00	24	0.125
44	A	4	3	1.00	24	0.125
45	A	5	4	1.00	24	0.167
46	A	4	3	1.00	22	0.136
47	A	3	3	1.00	22	0.136
48	A	1	1	1.00	24	0.042
49	A	4	3	1.00	24	0.125
50	A	4	3	1.00	24	0.125
51	A	4	3	1.00	24	0.125
52	A	6	4	1.00	24	0.167
53	A	5	3	1.00	22	0.136
54	A	4	4	1.00	22	0.182
55	A	3	2	1.00	24	0.083
56	A	2	2	1.00	24	0.083
57	A	4	2	1.00	24	0.083
58	A	4	2	1.00	24	0.083
59	A	3	2	1.00	24	0.083
60	A	3	2	1.00	24	0.083
61	A	3	2	1.00	24	0.083
62	A	2	2	1.00	24	0.083
63	A	5	3	1.00	15	0.200
64	A	3	2	1.00	24	0.083
65	A	3	2	1.00	24	0.083
66	A	3	2	1.00	24	0.083
67	A	2	2	1.00	24	0.083
68	A	4	3	1.00	24	0.125
69	A	4	3	1.00	24	0.125
70	A	6	3	1.00	22	0.136
71	A	5	4	1.00	22	0.182

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
72	A	4	3	1.00	24	0.125
73	A	1	1	1.00	24	0.042
74	A	3	2	1.00	24	0.083
75	A	5	3	1.00	24	0.125
76	A	5	3	1.00	24	0.125
77	A	3	2	1.00	24	0.083
78	A	3	2	1.00	24	0.083
79	A	3	2	1.00	24	0.083
80	A	2	2	1.00	24	0.083
81	A	8	3	1.00	15	0.200
82	A	3	2	1.00	24	0.083
83	A	3	2	1.00	24	0.083
84	A	3	2	1.00	24	0.083
85	A	2	2	1.00	24	0.083
86	A	3	2	1.00	24	0.083
87	A	3	2	1.00	24	0.083
88	A	2	2	1.00	24	0.083
89	A	4	3	1.00	24	0.125
90	A	4	3	1.00	24	0.125
91	A	8	4	1.00	22	0.182
92	A	7	4	1.00	24	0.167
93	A	6	4	1.00	24	0.167
94	A	5	2	1.00	24	0.083
95	A	2	2	1.00	24	0.083
96	A	4	2	1.00	24	0.083
97	A	6	2	1.00	24	0.083
98	A	6	2	1.00	24	0.083
99	A	3	2	1.00	24	0.083
100	A	3	2	1.00	24	0.083
101	A	3	2	1.00	24	0.083
102	A	2	1	1.00	24	0.042
103	A	2	2	1.00	24	0.083
104	A	2	2	1.00	15	0.133
105	A	4	3	1.00	24	0.125
106	A	4	3	1.00	24	0.125
107	A	4	3	1.00	24	0.125

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
108	A	3	3	1.00	24	0.125
109	A	2	2	1.00	24	0.083
110	A	1	1	1.00	22	0.045
111	A	2	2	1.00	22	0.091
112	A	3	2	1.00	24	0.083
113	A	3	2	1.00	24	0.083
114	A	3	2	1.00	24	0.083
115	A	3	2	1.00	24	0.083
116	A	2	2	1.00	24	0.083
117	A	3	2	1.00	24	0.083
118	A	2	2	1.00	24	0.083
119	A	3	2	1.00	15	0.133
120	A	4	3	1.00	24	0.125
121	A	4	3	1.00	24	0.125
122	A	5	3	1.00	24	0.125
123	A	4	3	1.00	24	0.125
124	A	3	3	1.00	24	0.125
125	A	2	2	1.00	24	0.083
126	A	2	2	1.00	22	0.091
127	A	3	2	1.00	22	0.091
128	A	3	2	1.00	24	0.083
129	A	3	2	1.00	24	0.083
130	A	3	2	1.00	24	0.083
131	A	3	2	1.00	24	0.083
132	A	3	2	1.00	24	0.083
133	A	2	2	1.00	24	0.083
134	A	3	2	1.00	24	0.083
135	A	3	2	1.00	24	0.083
136	A	2	2	1.00	24	0.083
137	A	4	2	1.00	15	0.133
138	A	4	3	1.00	24	0.125
139	A	4	3	1.00	24	0.125
140	A	5	4	1.00	24	0.167
141	A	4	4	1.00	24	0.167
142	A	3	3	1.00	24	0.125
143	A	1	1	1.00	24	0.042

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
144	A	3	2	1.00	22	0.091
145	A	4	3	1.00	22	0.136
146	A	4	3	1.00	24	0.125
147	A	4	3	1.00	24	0.125
148	A	3	2	1.00	24	0.083
149	A	3	2	1.00	24	0.083
150	A	2	2	1.00	24	0.083
151	A	3	2	1.00	24	0.083
152	A	3	2	1.00	24	0.083
153	A	2	2	1.00	24	0.083
154	A	2	2	1.00	24	0.083
155	A	5	2	1.00	15	0.133
156	A	4	3	1.00	24	0.125
157	A	4	3	1.00	24	0.125
158	A	5	3	1.00	24	0.125
159	A	4	3	1.00	24	0.125
160	A	3	2	1.00	24	0.083
161	A	2	2	1.00	24	0.083
162	A	4	2	1.00	22	0.091
163	A	5	3	1.00	22	0.136
164	A	5	3	1.00	24	0.125
165	A	5	3	1.00	24	0.125
166	A	3	2	1.00	24	0.083
167	A	3	2	1.00	24	0.083
168	A	3	2	1.00	24	0.083
169	A	2	2	1.00	24	0.083
170	A	3	2	1.00	24	0.083
171	A	3	2	1.00	24	0.083
172	A	2	2	1.00	24	0.083
173	A	9	2	1.00	15	0.133
174	A	4	3	1.00	24	0.125
175	A	4	3	1.00	24	0.125
176	A	7	3	1.00	24	0.125
177	A	6	3	1.00	24	0.125
178	A	5	2	1.00	24	0.083
179	A	2	2	1.00	24	0.083

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
180	A	4	2	1.00	24	0.083
181	A	6	2	1.00	24	0.083
182	A	8	2	1.00	22	0.091
183	A	9	3	1.00	22	0.136
184	A	9	3	1.00	24	0.125
185	A	5	4	1.00	26	0.154
186	A	4	4	1.00	26	0.154
187	A	4	4	1.00	26	0.154
188	A	3	3	1.00	26	0.115
189	A	3	3	1.00	26	0.115
190	A	4	4	1.00	26	0.154
191	A	4	4	1.00	26	0.154
192	A	5	4	1.00	26	0.154
193	A	5	5	1.00	28	0.179
194	A	4	4	1.00	28	0.143
195	A	4	4	1.00	28	0.143
196	A	3	3	1.00	28	0.107
197	A	3	3	1.00	28	0.107
198	A	4	4	1.00	28	0.143
199	A	4	4	1.00	28	0.143
200	A	5	4	1.00	28	0.143
201	A	7	5	1.00	28	0.179
202	A	6	5	1.00	28	0.179
203	A	6	5	1.00	28	0.179
204	A	5	4	1.00	28	0.143
205	A	5	5	1.18	28	0.179
206	A	4	4	1.00	28	0.143
207	A	4	4	1.00	28	0.143
208	A	4	4	1.00	28	0.143
209	A	4	4	1.00	28	0.143
210	A	5	5	1.00	28	0.179
211	A	5	5	1.00	28	0.179
212	A	6	5	1.00	28	0.179
213	A	7	5	1.00	28	0.179
214	A	6	4	1.00	28	0.143
215	A	6	6	1.00	28	0.214

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
216	A	5	5	1.00	28	0.179
217	A	5	4	1.00	28	0.143
218	A	4	3	1.00	28	0.107
219	A	4	3	1.00	28	0.107
220	A	5	4	1.00	28	0.143
221	A	5	4	1.00	28	0.143
222	A	6	4	1.00	28	0.143
223	A	5	4	1.00	28	0.143
224	A	4	4	1.00	28	0.143
225	A	4	4	1.00	28	0.143
226	A	3	3	1.00	28	0.107
227	A	3	3	1.00	28	0.107
228	A	3	3	1.00	28	0.107
229	A	3	3	1.00	28	0.107
230	A	4	4	1.00	28	0.143
231	A	4	4	1.00	28	0.143
232	A	5	4	1.00	28	0.143
233	A	6	4	1.00	28	0.143
234	A	5	4	1.00	28	0.143
235	A	5	4	1.00	28	0.143
236	A	4	4	1.00	28	0.143
237	A	4	4	1.00	28	0.143
238	A	3	3	1.00	28	0.107
239	A	3	3	1.00	28	0.107
240	A	4	4	1.00	28	0.143
241	A	4	4	1.00	28	0.143
242	A	5	4	1.00	28	0.143
243	A	5	4	1.00	28	0.143
244	A	6	4	1.00	28	0.143
245	A	6	5	1.00	28	0.179
246	A	5	5	1.00	28	0.179
247	A	5	5	1.00	28	0.179
248	A	4	4	1.00	28	0.143
249	A	4	4	1.00	28	0.143
250	A	4	4	1.00	28	0.143
251	A	4	4	1.00	28	0.143

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
252	A	5	5	1.00	28	0.179
253	A	5	5	1.00	28	0.179
254	A	6	5	1.00	28	0.179
255	A	6	4	1.00	28	0.143
256	A	5	4	1.00	28	0.143
257	A	5	4	1.00	28	0.143
258	A	4	3	1.00	28	0.107
259	A	4	3	1.00	28	0.107
260	A	5	4	1.00	28	0.143
261	A	5	4	1.00	28	0.143
262	A	6	5	1.00	28	0.179
263	A	4	4	1.00	26	0.154
264	A	4	4	1.00	26	0.154
265	A	4	4	1.00	26	0.154
266	A	4	4	1.00	26	0.154
267	A	4	4	1.00	28	0.143
268	A	4	4	1.00	28	0.143
269	A	4	4	1.00	28	0.143
270	A	4	4	1.00	28	0.143
271	A	4	4	1.00	28	0.143
272	A	4	4	1.00	28	0.143
273	A	4	4	1.00	28	0.143
274	A	4	4	1.00	28	0.143
275	A	4	4	1.00	28	0.143
276	A	4	4	1.00	28	0.143
277	A	4	4	1.00	28	0.143
278	A	4	4	1.00	28	0.143
279	A	3	2	1.00	26	0.077
280	A	3	2	1.00	26	0.077
281	A	3	2	1.00	26	0.077
282	A	2	2	1.00	26	0.077
283	A	5	4	1.00	26	0.154
284	A	7	4	1.00	26	0.154
285	A	9	4	1.00	26	0.154
286	A	4	2	1.00	26	0.077
287	A	3	2	1.00	26	0.077

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
288	A	2	2	1.00	26	0.077
289	A	1	1	1.00	24	0.042
290	A	3	3	1.00	24	0.125
291	A	5	5	1.00	26	0.192
292	A	7	5	1.00	26	0.192
293	A	3	2	1.00	26	0.077
294	A	3	2	1.00	26	0.077
295	A	3	2	1.00	26	0.077
296	A	2	2	1.00	26	0.077
297	A	4	4	1.00	26	0.154
298	A	6	4	1.00	26	0.154
299	A	8	4	1.00	26	0.154
300	A	4	2	1.00	26	0.077
301	A	3	2	1.00	26	0.077
302	A	2	2	1.00	24	0.083
303	A	1	1	1.00	24	0.042
304	A	4	3	1.00	26	0.115
305	A	6	5	1.00	26	0.192
306	A	3	2	1.00	26	0.077
307	A	3	2	1.00	26	0.077
308	A	3	2	1.00	26	0.077
309	A	2	2	1.00	26	0.077
310	A	4	4	1.00	26	0.154
311	A	5	4	1.00	26	0.154
312	A	7	4	1.00	26	0.154
313	A	4	2	1.00	26	0.077
314	A	3	2	1.00	24	0.083
315	A	2	2	1.00	24	0.083
316	A	1	1	1.00	26	0.038
317	A	5	3	1.00	26	0.115
318	A	7	5	1.00	26	0.192
319	A	3	2	1.00	26	0.077
320	A	3	2	1.00	26	0.077
321	A	3	2	1.00	26	0.077
322	A	2	2	1.00	26	0.077
323	A	5	5	1.00	26	0.192

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
324	A	5	5	1.00	26	0.192
325	A	6	4	1.00	26	0.154
326	A	4	2	1.00	24	0.083
327	A	3	2	1.00	24	0.083
328	A	2	2	1.00	26	0.077
329	A	1	1	1.00	26	0.038
330	A	6	3	1.00	26	0.115
331	A	8	5	1.00	26	0.192
332	A	10	5	1.00	26	0.192
333	A	3	2	1.00	26	0.077
334	A	3	2	1.00	26	0.077
335	A	3	2	1.00	26	0.077
336	A	2	2	1.00	26	0.077
337	A	6	4	1.00	26	0.154
338	A	8	4	1.00	26	0.154
339	A	10	4	1.00	26	0.154
340	A	4	2	1.00	26	0.077
341	A	3	2	1.00	26	0.077
342	A	2	2	1.00	26	0.077
343	A	1	1	1.00	26	0.038
344	A	2	2	1.00	24	0.083
345	A	4	4	1.00	24	0.167
346	A	6	5	1.00	26	0.192
347	A	3	2	1.00	26	0.077
348	A	3	2	1.00	26	0.077
349	A	3	2	1.00	26	0.077
350	A	2	2	1.00	26	0.077
351	A	7	4	1.00	26	0.154
352	A	9	4	1.00	26	0.154
353	A	11	4	1.00	26	0.154
354	A	4	2	1.00	26	0.077
355	A	3	2	1.00	26	0.077
356	A	2	2	1.00	26	0.077
357	A	1	1	1.00	26	0.038
358	A	3	3	1.00	26	0.115
359	A	3	3	1.00	24	0.125

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
360	A	5	4	1.00	24	0.167
361	A	7	5	1.00	26	0.192
362	A	3	2	1.00	26	0.077
363	A	3	2	1.00	26	0.077
364	A	3	2	1.00	26	0.077
365	A	3	2	1.00	26	0.077
366	A	2	2	1.00	26	0.077
367	A	8	4	1.00	26	0.154
368	A	10	4	1.00	26	0.154
369	A	4	2	1.00	26	0.077
370	A	3	2	1.00	26	0.077
371	A	2	2	1.00	26	0.077
372	A	1	1	1.00	26	0.038
373	A	4	3	1.00	26	0.115
374	A	4	4	1.00	26	0.154
375	A	4	3	1.00	24	0.125
376	A	6	4	1.00	24	0.167
377	A	8	5	1.00	26	0.192
378	A	3	2	1.00	26	0.077
379	A	3	2	1.00	26	0.077
380	A	3	2	1.00	26	0.077
381	A	3	2	1.00	26	0.077
382	A	2	2	1.00	26	0.077
383	A	9	4	1.00	26	0.154
384	A	11	4	1.00	26	0.154
385	A	3	2	1.00	26	0.077
386	A	2	2	1.00	26	0.077
387	A	1	1	1.00	26	0.038
388	A	5	3	1.00	26	0.115
389	A	5	4	1.00	26	0.154
390	A	5	4	1.00	26	0.154
391	A	5	3	1.00	24	0.125
392	A	7	4	1.00	24	0.167
393	A	9	5	1.00	26	0.192
394	A	12	9	1.00	30	0.300
395	A	10	7	1.00	30	0.233

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
396	A	1	1	1.00	30	0.033
397	A	2	2	1.00	30	0.067
398	A	3	3	1.00	30	0.100
399	A	4	3	1.00	30	0.100
400	A	13	9	1.00	30	0.300
401	A	13	9	1.00	30	0.300
402	A	11	8	1.00	30	0.267
403	A	12	9	1.00	30	0.300
404	A	1	1	1.00	30	0.033
405	A	2	2	1.00	30	0.067
406	A	3	2	1.00	30	0.067
407	A	4	3	1.00	30	0.100
408	A	14	9	1.00	30	0.300
409	A	12	8	1.00	30	0.267
410	A	13	10	1.00	30	0.333
411	A	11	8	1.00	30	0.267
412	A	1	1	1.00	30	0.033
413	A	2	2	1.00	30	0.067
414	A	3	2	1.00	30	0.067
415	A	4	2	1.00	30	0.067
416	A	11	8	1.00	30	0.267
417	A	11	8	1.00	30	0.267
418	A	1	1	1.00	30	0.033
419	A	2	2	1.00	30	0.067
420	A	3	3	1.00	30	0.100
421	A	4	3	1.00	30	0.100
422	A	5	3	1.00	30	0.100
423	A	13	10	1.00	30	0.333
424	A	11	8	1.00	30	0.267
425	A	1	1	1.00	30	0.033
426	A	2	2	1.00	30	0.067
427	A	3	2	1.00	30	0.067
428	A	4	3	1.00	30	0.100
429	A	5	3	1.00	30	0.100
430	A	12	9	1.00	30	0.300
431	A	12	9	1.00	30	0.300

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
432	A	1	1	1.00	30	0.033
433	A	2	2	1.00	30	0.067
434	A	3	2	1.00	30	0.067
435	A	4	2	1.00	30	0.067
436	A	5	3	1.00	30	0.100
437	A	4	4	1.00	30	0.133
438	A	4	4	1.00	30	0.133
439	A	4	4	1.00	30	0.133
440	A	4	4	1.00	30	0.133
441	A	4	4	1.00	30	0.133
442	A	4	4	1.00	30	0.133
443	A	9	8	1.00	30	0.267
444	A	8	8	1.00	30	0.267
445	A	6	6	1.00	30	0.200
446	A	1	1	1.00	30	0.033
447	A	2	2	1.00	30	0.067
448	A	3	2	1.00	30	0.067
449	A	4	2	1.00	30	0.067
450	A	4	4	1.00	26	0.154
451	A	4	4	1.00	26	0.154
452	A	4	4	1.00	26	0.154
453	A	4	4	1.00	24	0.167
454	A	4	4	1.00	26	0.154
455	A	4	4	1.00	26	0.154
456	A	4	4	1.00	26	0.154
457	A	4	4	1.00	28	0.143
458	A	4	4	1.00	28	0.143
459	A	4	4	1.00	28	0.143
460	A	4	4	1.00	28	0.143
461	A	4	4	1.00	28	0.143
462	A	4	4	1.00	28	0.143
463	A	4	4	1.00	28	0.143
464	A	4	4	1.00	26	0.154
465	A	3	2	1.00	24	0.083
466	A	3	2	1.00	24	0.083
467	A	2	2	1.00	24	0.083

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
468	A	2	2	1.00	24	0.083
469	A	2	2	1.00	24	0.083
470	A	2	2	1.00	24	0.083
471	A	4	4	1.00	24	0.167
472	A	4	4	1.00	24	0.167
473	A	4	4	1.00	22	0.182
474	A	4	4	1.00	22	0.182
475	A	4	4	1.00	24	0.167
476	A	4	4	1.00	24	0.167
477	A	4	4	1.00	28	0.143
478	A	4	4	1.00	28	0.143
479	A	4	4	1.00	28	0.143
480	A	4	4	1.00	28	0.143
481	A	4	4	1.00	28	0.143
482	A	4	4	1.00	28	0.143
483	A	5	2	1.00	30	0.067
484	A	4	2	1.00	30	0.067
485	A	3	2	1.00	30	0.067
486	A	2	2	1.00	30	0.067
487	A	1	1	1.00	28	0.036
488	A	4	4	1.00	30	0.133
489	A	4	4	1.00	30	0.133
490	A	4	4	1.00	30	0.133
491	A	3	2	1.00	30	0.067
492	A	5	5	1.00	30	0.167
493	A	2	2	1.00	30	0.067
494	A	5	5	1.00	30	0.167
495	A	1	1	1.00	30	0.033
496	A	5	5	1.00	30	0.167
497	A	3	3	1.00	28	0.107
498	A	5	5	1.00	30	0.167
499	A	4	4	1.00	30	0.133
500	A	5	5	1.00	30	0.167
501	A	4	4	1.00	32	0.125
502	A	4	4	1.00	32	0.125
503	A	3	3	1.00	30	0.100

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
504	A	1	1	1.00	32	0.031
505	A	2	2	1.00	32	0.062
506	A	3	2	1.00	32	0.062
507	A	3	2	1.00	19	0.105
508	A	4	3	1.00	19	0.158
509	A	3	2	1.00	19	0.105
510	A	3	3	1.00	19	0.158
511	A	3	3	1.00	19	0.158
512	A	2	2	1.00	17	0.118
513	A	2	2	1.00	17	0.118
514	A	3	3	1.00	19	0.158
515	A	3	2	1.00	19	0.105
516	A	4	3	1.00	19	0.158
517	A	4	3	1.00	21	0.143
518	A	4	3	1.00	21	0.143
519	A	3	2	1.00	21	0.095
520	A	2	2	1.00	21	0.095
521	A	3	3	1.00	21	0.143
522	A	4	4	1.00	21	0.190
523	A	6	4	1.00	21	0.190
524	A	5	4	1.00	21	0.190
525	A	4	4	1.00	21	0.190
526	A	3	3	1.00	19	0.158
527	A	1	1	1.00	19	0.053
528	A	4	3	1.00	21	0.143
529	A	4	3	1.00	21	0.143
530	A	4	3	1.00	21	0.143
531	A	4	3	1.00	21	0.143
532	A	3	2	1.00	21	0.095
533	A	3	2	1.00	21	0.095
534	A	2	2	1.00	21	0.095
535	A	6	6	1.00	21	0.286
536	A	4	4	1.00	21	0.190
537	A	6	5	1.11	21	0.238
538	A	5	5	1.14	21	0.238
539	A	4	4	1.20	19	0.210

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
540	A	4	4	1.21	19	0.210
541	A	3	3	1.00	21	0.143
542	A	4	4	1.00	21	0.190
543	A	5	5	1.00	21	0.238
544	A	3	2	1.00	21	0.095
545	A	3	2	1.00	21	0.095
546	A	2	2	1.00	21	0.095
547	A	7	6	1.00	21	0.286
548	A	8	7	1.00	21	0.333
549	A	9	6	1.09	21	0.286
550	A	5	5	1.00	21	0.238
551	A	2	2	1.00	19	0.105
552	A	5	5	1.00	19	0.263
553	A	9	6	1.00	21	0.286
554	A	3	2	1.00	21	0.095
555	A	3	2	1.00	21	0.095
556	A	3	2	1.00	21	0.095
557	A	2	2	1.00	21	0.095
558	A	7	6	1.00	21	0.286
559	A	8	7	1.00	21	0.333
560	A	8	7	1.00	21	0.333
561	A	7	7	1.00	21	0.333
562	A	6	6	1.45	21	0.286
563	A	4	4	1.28	19	0.210
564	A	5	5	1.00	19	0.263
565	A	6	6	1.00	21	0.286
566	A	3	2	1.00	21	0.095
567	A	3	2	1.00	21	0.095
568	A	3	2	1.00	21	0.095
569	A	2	2	1.00	21	0.095
570	A	7	6	1.00	21	0.286
571	A	8	7	1.00	21	0.333
572	A	8	8	1.00	21	0.381
573	A	7	7	1.28	21	0.333
574	A	4	4	1.24	21	0.190
575	A	5	5	1.00	19	0.263

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
576	A	6	6	1.00	19	0.316
577	A	7	7	1.00	21	0.333
578	A	5	4	1.00	23	0.174
579	A	4	4	1.00	23	0.174
580	A	4	4	1.00	23	0.174
581	A	3	3	1.00	23	0.130
582	A	3	3	1.00	23	0.130
583	A	4	4	1.00	23	0.174
584	A	4	4	1.00	23	0.174
585	A	5	4	1.00	23	0.174
586	A	5	5	1.00	25	0.200
587	A	5	5	1.00	25	0.200
588	A	4	4	1.00	25	0.160
589	A	4	4	1.00	25	0.160
590	A	5	5	1.00	25	0.200
591	A	5	5	1.00	25	0.200
592	A	6	5	1.00	25	0.200
593	A	6	5	1.00	25	0.200
594	A	5	5	1.00	25	0.200
595	A	5	5	1.00	25	0.200
596	A	4	4	1.00	25	0.160
597	A	5	5	1.00	25	0.200
598	A	4	4	1.00	25	0.160
599	A	5	5	1.00	25	0.200
600	A	4	4	1.00	25	0.160
601	A	4	4	1.00	25	0.160
602	A	5	5	1.00	25	0.200
603	A	17	15	1.00	25	0.600
604	A	17	15	1.00	25	0.600
605	A	13	11	1.00	25	0.440
606	A	14	12	1.00	25	0.480
607	A	17	15	1.00	25	0.600
608	A	17	15	1.00	25	0.600
609	A	18	16	1.00	25	0.640
610	A	17	15	1.00	25	0.600
611	A	17	15	1.00	25	0.600

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
612	A	17	15	1.00	25	0.600
613	A	17	15	1.00	25	0.600
614	A	18	16	1.00	25	0.640
615	A	18	16	1.00	25	0.640
616	A	19	17	1.00	25	0.680
617	A	18	16	1.00	25	0.640
618	A	18	16	1.00	25	0.640
619	A	18	16	1.00	25	0.640
620	A	18	16	1.00	25	0.640
621	A	19	16	1.00	25	0.640
622	A	19	16	1.00	25	0.640
623	A	20	17	1.00	25	0.680
624	A	3	3	1.00	23	0.130
625	A	3	3	1.00	23	0.130
626	A	3	3	1.00	23	0.130
627	A	3	3	1.00	23	0.130
628	A	4	4	1.00	25	0.160
629	A	4	4	1.00	25	0.160
630	A	4	4	1.00	25	0.160
631	A	4	4	1.00	25	0.160
632	A	16	11	1.00	25	0.440
633	A	16	11	1.00	25	0.440
634	A	17	12	1.00	25	0.480
635	A	17	12	1.00	25	0.480
636	A	18	13	1.00	25	0.520
637	A	18	13	1.00	25	0.520
638	A	19	13	1.00	25	0.520
639	A	19	13	1.00	25	0.520
640	A	4	4	0.97	23	0.174
641	A	4	4	1.00	23	0.174
642	A	3	3	1.00	21	0.143
643	A	6	5	1.00	23	0.217
644	A	7	6	1.00	23	0.261
645	A	3	3	1.03	23	0.130
646	A	3	2	1.00	21	0.095
647	A	3	2	1.00	21	0.095

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
648	A	2	2	1.00	21	0.095
649	A	6	4	1.00	21	0.190
650	A	7	5	1.00	21	0.238
651	A	3	3	1.00	21	0.143
652	A	3	3	1.00	19	0.158
653	A	3	3	1.00	19	0.158
654	A	3	3	1.00	21	0.143
655	A	6	5	1.00	26	0.192
656	A	5	5	1.00	26	0.192
657	A	5	5	1.00	26	0.192
658	A	4	4	1.00	26	0.154
659	A	4	4	1.00	26	0.154
660	A	5	5	1.03	26	0.192
661	A	5	5	1.00	26	0.192
662	A	6	5	1.00	26	0.192
663	A	7	5	1.00	28	0.179
664	A	6	5	1.00	28	0.179
665	A	6	5	1.00	28	0.179
666	A	5	5	1.05	28	0.179
667	A	5	5	1.05	28	0.179
668	A	4	4	1.00	28	0.143
669	A	4	4	1.00	28	0.143
670	A	5	5	1.00	28	0.179
671	A	5	5	1.00	28	0.179
672	A	6	5	1.00	28	0.179
673	A	5	4	1.00	30	0.133
674	A	4	4	1.00	30	0.133
675	A	3	3	1.01	30	0.100
676	A	2	2	1.00	30	0.067
677	A	10	7	1.00	30	0.233
678	A	13	10	1.18	30	0.333
679	A	13	10	1.00	30	0.333
680	A	15	11	1.00	30	0.367
681	A	5	4	1.00	30	0.133
682	A	4	4	1.00	30	0.133
683	A	3	3	1.00	30	0.100

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
684	A	2	2	1.00	30	0.067
685	A	11	8	1.00	30	0.267
686	A	12	9	1.00	30	0.300
687	A	14	11	1.00	30	0.367
688	A	5	5	1.00	26	0.192
689	A	5	5	1.00	26	0.192
690	A	5	5	1.00	24	0.208
691	A	5	5	1.00	26	0.192
692	A	5	5	1.00	26	0.192
693	A	5	5	1.00	28	0.179
694	A	5	5	1.00	28	0.179
695	A	5	5	0.96	23	0.217
696	A	5	5	1.00	23	0.217
697	A	4	4	1.01	21	0.190
698	A	7	6	1.00	23	0.261
699	A	8	7	1.00	23	0.304
700	A	4	4	1.00	23	0.174

Chapter 3

Listing of integrals

3.1 $\int \sec^{10}(c+dx)(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=94

$$\frac{a\tan^9(c+dx)}{9d}+\frac{4a\tan^7(c+dx)}{7d}+\frac{6a\tan^5(c+dx)}{5d}+\frac{4a\tan^3(c+dx)}{3d}+\frac{a\tan(c+dx)}{d}+\frac{ia\sec^{10}(c+dx)}{10d}$$

```
[Out] 1/10*I*a*sec(d*x+c)^10/d+a*tan(d*x+c)/d+4/3*a*tan(d*x+c)^3/d+6/5*a*tan(d*x+
c)^5/d+4/7*a*tan(d*x+c)^7/d+1/9*a*tan(d*x+c)^9/d
```

Rubi [A] time = 0.19, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {3486, 3767}

$$\frac{a\tan^9(c+dx)}{9d}+\frac{4a\tan^7(c+dx)}{7d}+\frac{6a\tan^5(c+dx)}{5d}+\frac{4a\tan^3(c+dx)}{3d}+\frac{a\tan(c+dx)}{d}+\frac{ia\sec^{10}(c+dx)}{10d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^10*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((I/10)*a*Sec[c + d*x]^10)/d + (a*Tan[c + d*x])/d + (4*a*Tan[c + d*x]^3)/(3
*d) + (6*a*Tan[c + d*x]^5)/(5*d) + (4*a*Tan[c + d*x]^7)/(7*d) + (a*Tan[c +
d*x]^9)/(9*d)
```

Rule 3486

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

Rule 3767

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rubi steps

$$\int \sec^{10}(c+dx)(a+ia\tan(c+dx))\,dx = \frac{ia\sec^{10}(c+dx)}{10d} + a\int \sec^{10}(c+dx)\,dx$$
$$= \frac{ia\sec^{10}(c+dx)}{10d} - \frac{a\,\mathrm{Subst}\left(\int \left(1+4x^2+6x^4+4x^6+x^8\right)dx, x, -\tan(c$$
$$= \frac{ia\sec^{10}(c+dx)}{10d} + \frac{a\tan(c+dx)}{d} + \frac{4a\tan^3(c+dx)}{3d} + \frac{6a\tan^5(c+dx)}{5d} +$$

Mathematica [A] time = 0.40, size = 79, normalized size = 0.84

$$\frac{a\left(\frac{1}{9}\tan^9(c+dx)+\frac{4}{7}\tan^7(c+dx)+\frac{6}{5}\tan^5(c+dx)+\frac{4}{3}\tan^3(c+dx)+\tan(c+dx)\right)}{d}+\frac{ia\sec^{10}(c+dx)}{10d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^10*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((I/10)*a*Sec[c + d*x]^10)/d + (a*(Tan[c + d*x] + (4*Tan[c + d*x]^3)/3 + (6
*Tan[c + d*x]^5)/5 + (4*Tan[c + d*x]^7)/7 + Tan[c + d*x]^9/9))/d
```

fricas [B] time = 0.58, size = 189, normalized size = 2.01

$$\frac{64512i\,ae^{(10i\,dx+10i\,c)} + 53760i\,ae^{(8i\,dx+8i\,c)} + 30720i\,ae^{(6i\,dx+6i\,c)} + 11520i\,ae^{(4i}}{315\left(de^{(20i\,dx+20i\,c)} + 10\,de^{(18i\,dx+18i\,c)} + 45\,de^{(16i\,dx+16i\,c)} + 120\,de^{(14i\,dx+14i\,c)} + 210\,de^{(12i\,dx+12i\,c)} + 252\,de^{(10i\,dx+10i\,c)}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/315*(64512*I*a*e^(10*I*d*x + 10*I*c) + 53760*I*a*e^(8*I*d*x + 8*I*c) + 30
720*I*a*e^(6*I*d*x + 6*I*c) + 11520*I*a*e^(4*I*d*x + 4*I*c) + 2560*I*a*e^(2
*I*d*x + 2*I*c) + 256*I*a)/(d*e^(20*I*d*x + 20*I*c) + 10*d*e^(18*I*d*x + 18
*I*c) + 45*d*e^(16*I*d*x + 16*I*c) + 120*d*e^(14*I*d*x + 14*I*c) + 210*d*e^
(12*I*d*x + 12*I*c) + 252*d*e^(10*I*d*x + 10*I*c) + 210*d*e^(8*I*d*x + 8*I*
c) + 120*d*e^(6*I*d*x + 6*I*c) + 45*d*e^(4*I*d*x + 4*I*c) + 10*d*e^(2*I*d*x
 + 2*I*c) + d)
```

giac [A] time = 0.79, size = 114, normalized size = 1.21

$$-\frac{-63i\,a\tan(dx+c)^{10} - 70\,a\tan(dx+c)^9 - 315i\,a\tan(dx+c)^8 - 360\,a\tan(dx+c)^7 - 630i\,a\tan(dx+c)^6 - 75}{630\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10*(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/630*(-63*I*a*tan(d*x + c)^10 - 70*a*tan(d*x + c)^9 - 315*I*a*tan(d*x + c
)^8 - 360*a*tan(d*x + c)^7 - 630*I*a*tan(d*x + c)^6 - 756*a*tan(d*x + c)^5
- 630*I*a*tan(d*x + c)^4 - 840*a*tan(d*x + c)^3 - 315*I*a*tan(d*x + c)^2 -
630*a*tan(d*x + c))/d
```

maple [A] time = 0.47, size = 69, normalized size = 0.73

$$\frac{\frac{ia}{10\cos(dx+c)^{10}} - a\left(-\frac{128}{315} - \frac{\left(\sec^8(dx+c)\right)}{9} - \frac{8\left(\sec^6(dx+c)\right)}{63} - \frac{16\left(\sec^4(dx+c)\right)}{105} - \frac{64\left(\sec^2(dx+c)\right)}{315}\right)\tan(dx+c)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^10*(a+I*a*tan(d*x+c)),x)
```

```
[Out] 1/d*(1/10*I*a/cos(d*x+c)^10-a*(-128/315-1/9*sec(d*x+c)^8-8/63*sec(d*x+c)^6-
16/105*sec(d*x+c)^4-64/315*sec(d*x+c)^2)*tan(d*x+c))
```

maxima [A] time = 0.58, size = 114, normalized size = 1.21

$$\frac{63i\,a\tan\left(dx+c\right)^{10}+70\,a\tan\left(dx+c\right)^{9}+315i\,a\tan\left(dx+c\right)^{8}+360\,a\tan\left(dx+c\right)^{7}+630i\,a\tan\left(dx+c\right)^{6}+75}{630\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/630*(63*I*a*tan(d*x + c)^10 + 70*a*tan(d*x + c)^9 + 315*I*a*tan(d*x + c)^
8 + 360*a*tan(d*x + c)^7 + 630*I*a*tan(d*x + c)^6 + 756*a*tan(d*x + c)^5 +
630*I*a*tan(d*x + c)^4 + 840*a*tan(d*x + c)^3 + 315*I*a*tan(d*x + c)^2 + 63
0*a*tan(d*x + c))/d
```

mupad [B] time = 3.52, size = 106, normalized size = 1.13

$$\frac{a\left(-\cos\left(c+d\,x\right)^{10}\,63\mathrm{i}+256\,\sin\left(c+d\,x\right)\,\cos\left(c+d\,x\right)^{9}+128\,\sin\left(c+d\,x\right)\,\cos\left(c+d\,x\right)^{7}+96\,\sin\left(c+d\,x\right)\,\mathrm{c}\right.}{630\,d\cos\left(c+d\,x\right)^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)/cos(c + d*x)^10,x)
```

```
[Out] (a*(70*cos(c + d*x)*sin(c + d*x) + 80*cos(c + d*x)^3*sin(c + d*x) + 96*cos(
c + d*x)^5*sin(c + d*x) + 128*cos(c + d*x)^7*sin(c + d*x) + 256*cos(c + d*x
)^9*sin(c + d*x) - cos(c + d*x)^10*63i + 63i))/(630*d*cos(c + d*x)^10)
```

sympy [A] time = 11.22, size = 83, normalized size = 0.88

$$\begin{cases} \frac{a\left(\frac{\tan^{9}{\left(c+dx \right)}}{9}+\frac{4\tan^{7}{\left(c+dx \right)}}{7}+\frac{6\tan^{5}{\left(c+dx \right)}}{5}+\frac{4\tan^{3}{\left(c+dx \right)}}{3}+\tan{\left(c+dx \right)}\right)+\frac{ia\sec^{10}{\left(c+dx \right)}}{10}}{d} & \text{for}\: d \neq 0 \\ x \left(ia\tan{\left(c \right)}+a\right)\sec^{10}{\left(c \right)} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**10*(a+I*a*tan(d*x+c)),x)
```

```
[Out] Piecewise(((a*(tan(c + d*x)**9/9 + 4*tan(c + d*x)**7/7 + 6*tan(c + d*x)**5/
5 + 4*tan(c + d*x)**3/3 + tan(c + d*x)) + I*a*sec(c + d*x)**10/10)/d, Ne(d,
 0)), (x*(I*a*tan(c) + a)*sec(c)**10, True))
```

3.2 $\int \sec^8(c+dx)(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=75

$$\frac{a\tan^7(c+dx)}{7d}+\frac{3a\tan^5(c+dx)}{5d}+\frac{a\tan^3(c+dx)}{d}+\frac{a\tan(c+dx)}{d}+\frac{ia\sec^8(c+dx)}{8d}$$

```
[Out] 1/8*I*a*sec(d*x+c)^8/d+a*tan(d*x+c)/d+a*tan(d*x+c)^3/d+3/5*a*tan(d*x+c)^5/d
+1/7*a*tan(d*x+c)^7/d
```

Rubi [A] time = 0.04, antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {3486, 3767}

$$\frac{a\tan^7(c+dx)}{7d}+\frac{3a\tan^5(c+dx)}{5d}+\frac{a\tan^3(c+dx)}{d}+\frac{a\tan(c+dx)}{d}+\frac{ia\sec^8(c+dx)}{8d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^8*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((I/8)*a*Sec[c + d*x]^8)/d + (a*Tan[c + d*x])/d + (a*Tan[c + d*x]^3)/d + (3
*a*Tan[c + d*x]^5)/(5*d) + (a*Tan[c + d*x]^7)/(7*d)
```

Rule 3486

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

Rule 3767

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rubi steps

$$\begin{aligned}\int \sec^8(c+dx)(a+ia\tan(c+dx))\,dx &= \frac{ia\sec^8(c+dx)}{8d}+a\int \sec^8(c+dx)\,dx\\ &= \frac{ia\sec^8(c+dx)}{8d}-\frac{a\,\text{Subst}\left(\int \left(1+3x^2+3x^4+x^6\right)dx,x,-\tan(c+dx)\right)}{d}\\ &= \frac{ia\sec^8(c+dx)}{8d}+\frac{a\tan(c+dx)}{d}+\frac{a\tan^3(c+dx)}{d}+\frac{3a\tan^5(c+dx)}{5d}+\frac{a}{}\end{aligned}$$

Mathematica [A] time = 0.12, size = 63, normalized size = 0.84

$$\frac{a\left(\frac{1}{7}\tan^7(c+dx)+\frac{3}{5}\tan^5(c+dx)+\tan^3(c+dx)+\tan(c+dx)\right)}{d}+\frac{ia\sec^8(c+dx)}{8d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^8*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((I/8)*a*Sec[c + d*x]^8)/d + (a*(Tan[c + d*x] + Tan[c + d*x]^3 + (3*Tan[c +
d*x]^5)/5 + Tan[c + d*x]^7/7))/d
```

fricas [B] time = 0.69, size = 153, normalized size = 2.04

$$\frac{2240i\,ae^{(8i\,dx+8i\,c)}+1792i\,ae^{(6i\,dx+6i\,c)}+896i\,ae^{(4i\,dx+4i\,c)}+256i\,ae^{(2i\,dx+2i\,c)}+32i\,a}{35\left(de^{(16i\,dx+16i\,c)}+8\,de^{(14i\,dx+14i\,c)}+28\,de^{(12i\,dx+12i\,c)}+56\,de^{(10i\,dx+10i\,c)}+70\,de^{(8i\,dx+8i\,c)}+56\,de^{(6i\,dx+6i\,c)}+28\,d\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/35*(2240*I*a*e^(8*I*d*x + 8*I*c) + 1792*I*a*e^(6*I*d*x + 6*I*c) + 896*I*a
*e^(4*I*d*x + 4*I*c) + 256*I*a*e^(2*I*d*x + 2*I*c) + 32*I*a)/(d*e^(16*I*d*x
 + 16*I*c) + 8*d*e^(14*I*d*x + 14*I*c) + 28*d*e^(12*I*d*x + 12*I*c) + 56*d*
e^(10*I*d*x + 10*I*c) + 70*d*e^(8*I*d*x + 8*I*c) + 56*d*e^(6*I*d*x + 6*I*c)
 + 28*d*e^(4*I*d*x + 4*I*c) + 8*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [A] time = 1.00, size = 92, normalized size = 1.23

$$-\frac{-35i\,a\tan\left(dx+c\right)^{8}-40\,a\tan\left(dx+c\right)^{7}-140i\,a\tan\left(dx+c\right)^{6}-168\,a\tan\left(dx+c\right)^{5}-210i\,a\tan\left(dx+c\right)^{4}-2}{280\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/280*(-35*I*a*tan(d*x + c)^8 - 40*a*tan(d*x + c)^7 - 140*I*a*tan(d*x + c)
^6 - 168*a*tan(d*x + c)^5 - 210*I*a*tan(d*x + c)^4 - 280*a*tan(d*x + c)^3 -
 140*I*a*tan(d*x + c)^2 - 280*a*tan(d*x + c))/d
```

maple [A] time = 0.44, size = 59, normalized size = 0.79

$$\frac{\frac{ia}{8\cos(dx+c)^{8}}-a\left(-\frac{16}{35}-\frac{\left(\sec^{6}(dx+c)\right)}{7}-\frac{6\left(\sec^{4}(dx+c)\right)}{35}-\frac{8\left(\sec^{2}(dx+c)\right)}{35}\right)\tan\left(dx+c\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^8*(a+I*a*tan(d*x+c)),x)
```

```
[Out] 1/d*(1/8*I*a/cos(d*x+c)^8-a*(-16/35-1/7*sec(d*x+c)^6-6/35*sec(d*x+c)^4-8/35
*sec(d*x+c)^2)*tan(d*x+c))
```

maxima [A] time = 0.57, size = 92, normalized size = 1.23

$$\frac{35i\,a\tan\left(dx+c\right)^{8}+40\,a\tan\left(dx+c\right)^{7}+140i\,a\tan\left(dx+c\right)^{6}+168\,a\tan\left(dx+c\right)^{5}+210i\,a\tan\left(dx+c\right)^{4}+280}{280\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/280*(35*I*a*tan(d*x + c)^8 + 40*a*tan(d*x + c)^7 + 140*I*a*tan(d*x + c)^6
 + 168*a*tan(d*x + c)^5 + 210*I*a*tan(d*x + c)^4 + 280*a*tan(d*x + c)^3 + 1
40*I*a*tan(d*x + c)^2 + 280*a*tan(d*x + c))/d
```

mupad [B] time = 3.27, size = 149, normalized size = 1.99

$$\frac{a\,\sin\left(c+d\,x\right)\,\left(280\cos\left(c+d\,x\right)^{7}+\cos\left(c+d\,x\right)^{6}\,\sin\left(c+d\,x\right)\,140\mathrm{i}+280\cos\left(c+d\,x\right)^{5}\,\sin\left(c+d\,x\right)^{2}+\cos\left(c\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)/cos(c + d*x)^8,x)
```

```
[Out] (a*sin(c + d*x)*(40*cos(c + d*x)*sin(c + d*x)^6 + cos(c + d*x)^6*sin(c + d*
x)*140i + 280*cos(c + d*x)^7 + sin(c + d*x)^7*35i + cos(c + d*x)^2*sin(c +
d*x)^5*140i + 168*cos(c + d*x)^3*sin(c + d*x)^4 + cos(c + d*x)^4*sin(c + d*
x)^3*210i + 280*cos(c + d*x)^5*sin(c + d*x)^2))/(280*d*cos(c + d*x)^8)
```

sympy [A] time = 7.06, size = 68, normalized size = 0.91

$$\begin{cases} \frac{a\left(\frac{\tan^7(c+dx)}{7}+\frac{3\tan^5(c+dx)}{5}+\tan^3(c+dx)+\tan(c+dx)\right)+\frac{ia\sec^8(c+dx)}{8}}{d} & \text{for } d \neq 0 \\ x\left(ia\tan(c)+a\right)\sec^8(c) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8*(a+I*a*tan(d*x+c)),x)
```

```
[Out] Piecewise(((a*(tan(c + d*x)**7/7 + 3*tan(c + d*x)**5/5 + tan(c + d*x)**3 +
tan(c + d*x)) + I*a*sec(c + d*x)**8/8)/d, Ne(d, 0)), (x*(I*a*tan(c) + a)*se
c(c)**8, True))
```

3.3 $\int \sec^6(c+dx)(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=62

$$\frac{a\tan^5(c+dx)}{5d}+\frac{2a\tan^3(c+dx)}{3d}+\frac{a\tan(c+dx)}{d}+\frac{ia\sec^6(c+dx)}{6d}$$

```
[Out] 1/6*I*a*sec(d*x+c)^6/d+a*tan(d*x+c)/d+2/3*a*tan(d*x+c)^3/d+1/5*a*tan(d*x+c)
^5/d
```

Rubi [A] time = 0.04, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {3486, 3767}

$$\frac{a\tan^5(c+dx)}{5d}+\frac{2a\tan^3(c+dx)}{3d}+\frac{a\tan(c+dx)}{d}+\frac{ia\sec^6(c+dx)}{6d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((I/6)*a*Sec[c + d*x]^6)/d + (a*Tan[c + d*x])/d + (2*a*Tan[c + d*x]^3)/(3*d
) + (a*Tan[c + d*x]^5)/(5*d)
```

Rule 3486

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

Rule 3767

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rubi steps

$$\begin{aligned}\int \sec^6(c+dx)(a+ia\tan(c+dx))\,dx &= \frac{ia\sec^6(c+dx)}{6d}+a\int \sec^6(c+dx)\,dx\\ &= \frac{ia\sec^6(c+dx)}{6d}-\frac{a\,\text{Subst}\left(\int \left(1+2x^2+x^4\right)\,dx,x,-\tan(c+dx)\right)}{d}\\ &= \frac{ia\sec^6(c+dx)}{6d}+\frac{a\tan(c+dx)}{d}+\frac{2a\tan^3(c+dx)}{3d}+\frac{a\tan^5(c+dx)}{5d}\end{aligned}$$

Mathematica [A] time = 0.13, size = 55, normalized size = 0.89

$$\frac{a\left(\frac{1}{5}\tan^5(c+dx)+\frac{2}{3}\tan^3(c+dx)+\tan(c+dx)\right)}{d}+\frac{ia\sec^6(c+dx)}{6d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((I/6)*a*Sec[c + d*x]^6)/d + (a*(Tan[c + d*x] + (2*Tan[c + d*x]^3)/3 + Tan[
c + d*x]^5/5))/d
```

fricas [B] time = 0.48, size = 117, normalized size = 1.89

$$\frac{320i\,ae^{(6i\,dx+6i\,c)} + 240i\,ae^{(4i\,dx+4i\,c)} + 96i\,ae^{(2i\,dx+2i\,c)} + 16i\,a}{15\left(de^{(12i\,dx+12i\,c)} + 6\,de^{(10i\,dx+10i\,c)} + 15\,de^{(8i\,dx+8i\,c)} + 20\,de^{(6i\,dx+6i\,c)} + 15\,de^{(4i\,dx+4i\,c)} + 6\,de^{(2i\,dx+2i\,c)} + d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/15*(320*I*a*e^(6*I*d*x + 6*I*c) + 240*I*a*e^(4*I*d*x + 4*I*c) + 96*I*a*e^
(2*I*d*x + 2*I*c) + 16*I*a)/(d*e^(12*I*d*x + 12*I*c) + 6*d*e^(10*I*d*x + 10
*I*c) + 15*d*e^(8*I*d*x + 8*I*c) + 20*d*e^(6*I*d*x + 6*I*c) + 15*d*e^(4*I*d
*x + 4*I*c) + 6*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [A] time = 0.67, size = 70, normalized size = 1.13

$$-\frac{-5i\,a\tan\left(dx+c\right)^{6} - 6\,a\tan\left(dx+c\right)^{5} - 15i\,a\tan\left(dx+c\right)^{4} - 20\,a\tan\left(dx+c\right)^{3} - 15i\,a\tan\left(dx+c\right)^{2} - 30\,a\tan\left(a\right.}{30\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/30*(-5*I*a*tan(d*x + c)^6 - 6*a*tan(d*x + c)^5 - 15*I*a*tan(d*x + c)^4 -
 20*a*tan(d*x + c)^3 - 15*I*a*tan(d*x + c)^2 - 30*a*tan(d*x + c))/d
```

maple [A] time = 0.44, size = 49, normalized size = 0.79

$$\frac{\frac{ia}{6\cos(dx+c)^{6}} - a\left(-\frac{8}{15} - \frac{\left(\sec^{4}(dx+c)\right)}{5} - \frac{4\left(\sec^{2}(dx+c)\right)}{15}\right)\tan\left(dx+c\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6*(a+I*a*tan(d*x+c)),x)
```

```
[Out] 1/d*(1/6*I*a/cos(d*x+c)^6-a*(-8/15-1/5*sec(d*x+c)^4-4/15*sec(d*x+c)^2)*tan(
d*x+c))
```

maxima [A] time = 0.48, size = 70, normalized size = 1.13

$$\frac{5i\,a\tan\left(dx+c\right)^{6} + 6\,a\tan\left(dx+c\right)^{5} + 15i\,a\tan\left(dx+c\right)^{4} + 20\,a\tan\left(dx+c\right)^{3} + 15i\,a\tan\left(dx+c\right)^{2} + 30\,a\tan\left(dx\right.}{30\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/30*(5*I*a*tan(d*x + c)^6 + 6*a*tan(d*x + c)^5 + 15*I*a*tan(d*x + c)^4 + 2
0*a*tan(d*x + c)^3 + 15*I*a*tan(d*x + c)^2 + 30*a*tan(d*x + c))/d
```

mupad [B] time = 3.24, size = 112, normalized size = 1.81

$$\frac{a\,\sin\left(c+d\,x\right)\,\left(30\cos\left(c+d\,x\right)^{5} + \cos\left(c+d\,x\right)^{4}\,\sin\left(c+d\,x\right)\,15\mathrm{i} + 20\cos\left(c+d\,x\right)^{3}\sin\left(c+d\,x\right)^{2} + \cos\left(c+d\,x\right)\right.}{30\,d\cos\left(c+d\,x\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)/cos(c + d*x)^6,x)
```

```
[Out] (a*sin(c + d*x)*(6*cos(c + d*x)*sin(c + d*x)^4 + cos(c + d*x)^4*sin(c + d*x
)*15i + 30*cos(c + d*x)^5 + sin(c + d*x)^5*5i + cos(c + d*x)^2*sin(c + d*x)
^3*15i + 20*cos(c + d*x)^3*sin(c + d*x)^2))/(30*d*cos(c + d*x)^6)
```

sympy [A] time = 4.61, size = 60, normalized size = 0.97

$$\begin{cases} \frac{a\left(\frac{\tan^5(c+dx)}{5}+\frac{2\tan^3(c+dx)}{3}+\tan(c+dx)\right)+\frac{ia\sec^6(c+dx)}{6}}{d} & \text{for } d\neq 0 \\ x\left(ia\tan(c)+a\right)\sec^6(c) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6*(a+I*a*tan(d*x+c)),x)
```

```
[Out] Piecewise(((a*(tan(c + d*x)**5/5 + 2*tan(c + d*x)**3/3 + tan(c + d*x)) + I*
a*sec(c + d*x)**6/6)/d, Ne(d, 0)), (x*(I*a*tan(c) + a)*sec(c)**6, True))
```

3.4 $\int \sec^4(c+dx)(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=46

$$\frac{a\tan^3(c+dx)}{3d}+\frac{a\tan(c+dx)}{d}+\frac{ia\sec^4(c+dx)}{4d}$$

```
[Out] 1/4*I*a*sec(d*x+c)^4/d+a*tan(d*x+c)/d+1/3*a*tan(d*x+c)^3/d
```

Rubi [A] time = 0.03, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {3486, 3767}

$$\frac{a\tan^3(c+dx)}{3d}+\frac{a\tan(c+dx)}{d}+\frac{ia\sec^4(c+dx)}{4d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((I/4)*a*Sec[c + d*x]^4)/d + (a*Tan[c + d*x])/d + (a*Tan[c + d*x]^3)/(3*d)
```

Rule 3486

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

Rule 3767

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rubi steps

$$\begin{aligned}\int \sec^4(c+dx)(a+ia\tan(c+dx))\,dx &= \frac{ia\sec^4(c+dx)}{4d}+a\int \sec^4(c+dx)\,dx\\ &= \frac{ia\sec^4(c+dx)}{4d}-\frac{a\,\text{Subst}\left(\int \left(1+x^2\right)dx,x,-\tan(c+dx)\right)}{d}\\ &= \frac{ia\sec^4(c+dx)}{4d}+\frac{a\tan(c+dx)}{d}+\frac{a\tan^3(c+dx)}{3d}\end{aligned}$$

Mathematica [A] time = 0.05, size = 43, normalized size = 0.93

$$\frac{a\left(\frac{1}{3}\tan^3(c+dx)+\tan(c+dx)\right)}{d}+\frac{ia\sec^4(c+dx)}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((I/4)*a*Sec[c + d*x]^4)/d + (a*(Tan[c + d*x] + Tan[c + d*x]^3/3))/d
```

fricas [B] time = 0.43, size = 81, normalized size = 1.76

$$\frac{24i\,ae^{(4i\,dx+4i\,c)}+16i\,ae^{(2i\,dx+2i\,c)}+4i\,a}{3\left(de^{(8i\,dx+8i\,c)}+4\,de^{(6i\,dx+6i\,c)}+6\,de^{(4i\,dx+4i\,c)}+4\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/3*(24*I*a*e^(4*I*d*x + 4*I*c) + 16*I*a*e^(2*I*d*x + 2*I*c) + 4*I*a)/(d*e^
(8*I*d*x + 8*I*c) + 4*d*e^(6*I*d*x + 6*I*c) + 6*d*e^(4*I*d*x + 4*I*c) + 4*d
*e^(2*I*d*x + 2*I*c) + d)
```

giac [A] time = 0.62, size = 48, normalized size = 1.04

$$-\frac{-3i\,a\tan\left(dx+c\right)^{4}-4\,a\tan\left(dx+c\right)^{3}-6i\,a\tan\left(dx+c\right)^{2}-12\,a\tan\left(dx+c\right)}{12\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/12*(-3*I*a*tan(d*x + c)^4 - 4*a*tan(d*x + c)^3 - 6*I*a*tan(d*x + c)^2 -
12*a*tan(d*x + c))/d
```

maple [A] time = 0.42, size = 39, normalized size = 0.85

$$\frac{\frac{ia}{4\cos(dx+c)^{4}}-a\left(-\frac{2}{3}-\frac{\left(\sec^{2}(dx+c)\right)}{3}\right)\tan\left(dx+c\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4*(a+I*a*tan(d*x+c)),x)
```

```
[Out] 1/d*(1/4*I*a/cos(d*x+c)^4-a*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c))
```

maxima [A] time = 0.60, size = 48, normalized size = 1.04

$$\frac{3i\,a\tan\left(dx+c\right)^{4}+4\,a\tan\left(dx+c\right)^{3}+6i\,a\tan\left(dx+c\right)^{2}+12\,a\tan\left(dx+c\right)}{12\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/12*(3*I*a*tan(d*x + c)^4 + 4*a*tan(d*x + c)^3 + 6*I*a*tan(d*x + c)^2 + 12
*a*tan(d*x + c))/d
```

mupad [B] time = 3.24, size = 48, normalized size = 1.04

$$\frac{\frac{1\mathrm{i}\,a\tan(c+d\,x)^{4}}{4}+\frac{a\tan(c+d\,x)^{3}}{3}+\frac{1\mathrm{i}\,a\tan(c+d\,x)^{2}}{2}+a\tan\left(c+d\,x\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)/cos(c + d*x)^4,x)
```

```
[Out] (a*tan(c + d*x) + (a*tan(c + d*x)^2*1i)/2 + (a*tan(c + d*x)^3)/3 + (a*tan(c
 + d*x)^4*1i)/4)/d
```

sympy [A] time = 3.29, size = 48, normalized size = 1.04

$$\begin{cases} \frac{a\left(\frac{\tan^{3}(c+dx)}{3}+\tan\left(c+dx\right)\right)+\frac{ia\sec^{4}(c+dx)}{4}}{d} & \text{for}\ d\neq 0 \\ x\left(ia\tan\left(c\right)+a\right)\sec^{4}\left(c\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4*(a+I*a*tan(d*x+c)),x)
```

```
[Out] Piecewise(((a*(tan(c + d*x)**3/3 + tan(c + d*x)) + I*a*sec(c + d*x)**4/4)/d
, Ne(d, 0)), (x*(I*a*tan(c) + a)*sec(c)**4, True))
```

3.5 $\int \sec^2(c+dx)(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=27

$$-\frac{i(a+ia\tan(c+dx))^2}{2ad}$$

```
[Out] -1/2*I*(a+I*a*tan(d*x+c))^2/a/d
```

Rubi [A] time = 0.03, antiderivative size = 30, normalized size of antiderivative = 1.11, number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.136$, Rules used = {3486, 3767, 8}

$$\frac{a\tan(c+dx)}{d}+\frac{ia\sec^2(c+dx)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((I/2)*a*Sec[c + d*x]^2)/d + (a*Tan[c + d*x])/d
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 3486

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

Rule 3767

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rubi steps

$$\begin{aligned}
\int \sec^2(c+dx)(a+ia\tan(c+dx))\,dx &= \frac{ia\sec^2(c+dx)}{2d}+a\int \sec^2(c+dx)\,dx\\
&= \frac{ia\sec^2(c+dx)}{2d}-\frac{a\,\mathrm{Subst}\left(\int 1\,dx,x,-\tan(c+dx)\right)}{d}\\
&= \frac{ia\sec^2(c+dx)}{2d}+\frac{a\tan(c+dx)}{d}
\end{aligned}$$

Mathematica [A] time = 0.01, size = 30, normalized size = 1.11

$$\frac{a\tan(c+dx)}{d}+\frac{ia\sec^2(c+dx)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((I/2)*a*Sec[c + d*x]^2)/d + (a*Tan[c + d*x])/d
```

fricas [B] time = 0.40, size = 44, normalized size = 1.63

$$\frac{4i\,ae^{(2i\,dx+2i\,c)}+2i\,a}{de^{(4i\,dx+4i\,c)}+2\,de^{(2i\,dx+2i\,c)}+d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] (4*I*a*e^(2*I*d*x + 2*I*c) + 2*I*a)/(d*e^(4*I*d*x + 4*I*c) + 2*d*e^(2*I*d*x
 + 2*I*c) + d)
```

giac [A] time = 0.76, size = 26, normalized size = 0.96

$$-\frac{-i\,a\tan\left(dx+c\right)^{2}-2\,a\tan\left(dx+c\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/2*(-I*a*tan(d*x + c)^2 - 2*a*tan(d*x + c))/d
```

maple [A] time = 0.39, size = 26, normalized size = 0.96

$$\frac{\frac{ia}{2\cos(dx+c)^{2}}+a\tan\left(dx+c\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2*(a+I*a*tan(d*x+c)),x)
```

```
[Out] 1/d*(1/2*I*a/cos(d*x+c)^2+a*tan(d*x+c))
```

maxima [A] time = 0.46, size = 21, normalized size = 0.78

$$-\frac{i\left(i\,a\tan\left(dx+c\right)+a\right)^{2}}{2\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/2*I*(I*a*tan(d*x + c) + a)^2/(a*d)
```

mupad [B] time = 3.21, size = 23, normalized size = 0.85

$$\frac{a\tan\left(c+d\,x\right)\,\left(2+\tan\left(c+d\,x\right)\,1\mathrm{i}\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)/cos(c + d*x)^2,x)
```

```
[Out] (a*tan(c + d*x)*(tan(c + d*x)*1i + 2))/(2*d)
```

sympy [A] time = 2.36, size = 37, normalized size = 1.37

$$\begin{cases}\frac{\frac{ia\tan^{2}\left(c+dx\right)}{2}+a\tan\left(c+dx\right)}{d} & \text{for}\: d\neq 0\\x\left(ia\tan\left(c\right)+a\right)\sec^{2}\left(c\right) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2*(a+I*a*tan(d*x+c)),x)
```

```
[Out] Piecewise(((I*a*tan(c + d*x)**2/2 + a*tan(c + d*x))/d, Ne(d, 0)), (x*(I*a*t
an(c) + a)*sec(c)**2, True))
```

3.6 $\int (a + ia \tan(c + dx))\, dx$

Optimal. Leaf size=19

$$ax - \frac{ia \log(\cos(c + dx))}{d}$$

```
[Out] a*x-I*a*ln(cos(d*x+c))/d
```

Rubi [A] time = 0.01, antiderivative size = 19, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 1, integrand size = 13, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3475}

$$ax - \frac{ia \log(\cos(c + dx))}{d}$$

Antiderivative was successfully verified.

```
[In] Int[a + I*a*Tan[c + d*x],x]
```

```
[Out] a*x - (I*a*Log[Cos[c + d*x]])/d
```

Rule 3475

```
Int[tan[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[Log[RemoveContent[Cos[c + d
*x], x]]/d, x] /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned} \int (a + ia \tan(c + dx))\, dx &= ax + (ia) \int \tan(c + dx)\, dx \\ &= ax - \frac{ia \log(\cos(c + dx))}{d} \end{aligned}$$

Mathematica [A] time = 0.01, size = 19, normalized size = 1.00

$$ax - \frac{ia \log(\cos(c + dx))}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[a + I*a*Tan[c + d*x],x]
```

```
[Out] a*x - (I*a*Log[Cos[c + d*x]])/d
```

fricas [A] time = 0.63, size = 18, normalized size = 0.95

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

giac [A] time = 0.44, size = 18, normalized size = 0.95

$$ax - \frac{i\, a \log\left(|\cos\left(dx + c\right)|\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*x - I*a*log(abs(cos(d*x + c)))/d
```

maple [A] time = 0.01, size = 23, normalized size = 1.21

$$ax + \frac{ia\ln\left(1 + \tan^2(dx + c)\right)}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(a+I*a*tan(d*x+c),x)
```

```
[Out] a*x+1/2*I*a/d*ln(1+tan(d*x+c)^2)
```

maxima [A] time = 0.31, size = 17, normalized size = 0.89

$$ax + \frac{i\,a\log\left(\sec\left(dx + c\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a*x + I*a*log(sec(d*x + c))/d
```

mupad [B] time = 3.26, size = 17, normalized size = 0.89

$$\frac{a\,\ln\left(\tan\left(c + d\,x\right) + 1\mathrm{i}\right)\,1\mathrm{i}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (a*log(tan(c + d*x) + 1i)*1i)/d
```

sympy [A] time = 0.16, size = 24, normalized size = 1.26

$$-\frac{ia\log\left(e^{2idx} + e^{-2ic}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -I*a*log(exp(2*I*d*x) + exp(-2*I*c))/d
```

3.7 $\int \cos^2(c+dx)(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=45

$$-\frac{ia\cos^2(c+dx)}{2d}+\frac{a\sin(c+dx)\cos(c+dx)}{2d}+\frac{ax}{2}$$

```
[Out] 1/2*a*x-1/2*I*a*cos(d*x+c)^2/d+1/2*a*cos(d*x+c)*sin(d*x+c)/d
```

Rubi [A] time = 0.03, antiderivative size = 45, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {3486, 2635, 8}

$$-\frac{ia\cos^2(c+dx)}{2d}+\frac{a\sin(c+dx)\cos(c+dx)}{2d}+\frac{ax}{2}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (a*x)/2 - ((I/2)*a*Cos[c + d*x]^2)/d + (a*Cos[c + d*x]*Sin[c + d*x])/(2*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2635

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

Rule 3486

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

Rubi steps

$$\begin{aligned}\int \cos^2(c+dx)(a+ia\tan(c+dx))\,dx &= -\frac{ia\cos^2(c+dx)}{2d}+a\int \cos^2(c+dx)\,dx\\ &= -\frac{ia\cos^2(c+dx)}{2d}+\frac{a\cos(c+dx)\sin(c+dx)}{2d}+\frac{1}{2}a\int 1\,dx\\ &= \frac{ax}{2}-\frac{ia\cos^2(c+dx)}{2d}+\frac{a\cos(c+dx)\sin(c+dx)}{2d}\end{aligned}$$

Mathematica [A] time = 0.04, size = 48, normalized size = 1.07

$$\frac{a(c+dx)}{2d}+\frac{a\sin(2(c+dx))}{4d}-\frac{ia\cos^2(c+dx)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (a*(c + d*x))/(2*d) - ((I/2)*a*Cos[c + d*x]^2)/d + (a*Sin[2*(c + d*x)])/(4*
d)
```

fricas [A] time = 0.67, size = 23, normalized size = 0.51

$$\frac{2\,adx - i\,ae^{\left(2i\,dx+2i\,c\right)}}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
[Out] 1/4*(2*a*d*x - I*a*e^(2*I*d*x + 2*I*c))/d
```

giac [A] time = 0.53, size = 23, normalized size = 0.51

$$\frac{2\,adx - i\,ae^{\left(2i\,dx+2i\,c\right)}}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c)),x, algorithm="giac")
[Out] 1/4*(2*a*d*x - I*a*e^(2*I*d*x + 2*I*c))/d
```

maple [A] time = 0.32, size = 42, normalized size = 0.93

$$\frac{-\frac{ia\left(\cos^{2}\left(dx+c\right)\right)}{2}+a\left(\frac{\cos\left(dx+c\right)\sin\left(dx+c\right)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2*(a+I*a*tan(d*x+c)),x)
[Out] 1/d*(-1/2*I*a*cos(d*x+c)^2+a*(1/2*cos(d*x+c)*sin(d*x+c)+1/2*d*x+1/2*c))
```

maxima [A] time = 0.48, size = 38, normalized size = 0.84

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
[Out] 1/2*((d*x + c)*a + (a*tan(d*x + c) - I*a)/(tan(d*x + c)^2 + 1))/d
```

mupad [B] time = 3.23, size = 22, normalized size = 0.49

$$\frac{a\,x}{2}+\frac{a}{2\,d\,\left(\mathrm{tan}\left(c+d\,x\right)+1{}\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i),x)
[Out] (a*x)/2 + a/(2*d*(tan(c + d*x) + 1i))
```

sympy [A] time = 0.16, size = 41, normalized size = 0.91

$$\frac{ax}{2}+\begin{cases}-\frac{iae^{2ic}e^{2idx}}{4d} & \text{for}\: 4d \neq 0\\ \frac{axe^{2ic}}{2} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2*(a+I*a*tan(d*x+c)),x)
```

```
[Out] a*x/2 + Piecewise((-I*a*exp(2*I*c)*exp(2*I*d*x)/(4*d), Ne(4*d, 0)), (a*x*ex
p(2*I*c)/2, True))
```

3.8 $\int \cos^4(c+dx)(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=67

$$-\frac{ia\cos^4(c+dx)}{4d}+\frac{a\sin(c+dx)\cos^3(c+dx)}{4d}+\frac{3a\sin(c+dx)\cos(c+dx)}{8d}+\frac{3ax}{8}$$

```
[Out] 3/8*a*x-1/4*I*a*cos(d*x+c)^4/d+3/8*a*cos(d*x+c)*sin(d*x+c)/d+1/4*a*cos(d*x+
c)^3*sin(d*x+c)/d
```

Rubi [A] time = 0.04, antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.136$, Rules used = {3486, 2635, 8}

$$-\frac{ia\cos^4(c+dx)}{4d}+\frac{a\sin(c+dx)\cos^3(c+dx)}{4d}+\frac{3a\sin(c+dx)\cos(c+dx)}{8d}+\frac{3ax}{8}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (3*a*x)/8 - ((I/4)*a*Cos[c + d*x]^4)/d + (3*a*Cos[c + d*x]*Sin[c + d*x])/(8
*d) + (a*Cos[c + d*x]^3*Sin[c + d*x])/(4*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2635

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

Rule 3486

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

Rubi steps

$$\begin{aligned}\int \cos^4(c+dx)(a+ia\tan(c+dx))\,dx &= -\frac{ia\cos^4(c+dx)}{4d}+a\int \cos^4(c+dx)\,dx\\ &= -\frac{ia\cos^4(c+dx)}{4d}+\frac{a\cos^3(c+dx)\sin(c+dx)}{4d}+\frac{1}{4}(3a)\int \cos^2(c+dx\\ &= -\frac{ia\cos^4(c+dx)}{4d}+\frac{3a\cos(c+dx)\sin(c+dx)}{8d}+\frac{a\cos^3(c+dx)\sin(c}{4d}\\ &= \frac{3ax}{8}-\frac{ia\cos^4(c+dx)}{4d}+\frac{3a\cos(c+dx)\sin(c+dx)}{8d}+\frac{a\cos^3(c+dx)}{4d}\end{aligned}$$

Mathematica [A] time = 0.05, size = 46, normalized size = 0.69

$$\frac{a\left(8\sin(2(c+dx))+\sin(4(c+dx))-8i\cos^4(c+dx)+12c+12dx\right)}{32d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (a*(12*c + 12*d*x - (8*I)*Cos[c + d*x]^4 + 8*Sin[2*(c + d*x)] + Sin[4*(c + d*x)]))/(32*d)
```

fricas [A] time = 0.48, size = 56, normalized size = 0.84

$$\frac{\left(12\, adxe^{(2i\, dx+2i\, c)} - i\, ae^{(6i\, dx+6i\, c)} - 6i\, ae^{(4i\, dx+4i\, c)} + 2i\, a\right)e^{(-2i\, dx-2i\, c)}}{32\, d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/32*(12*a*d*x*e^(2*I*d*x + 2*I*c) - I*a*e^(6*I*d*x + 6*I*c) - 6*I*a*e^(4*I*d*x + 4*I*c) + 2*I*a)*e^(-2*I*d*x - 2*I*c)/d
```

giac [A] time = 0.54, size = 103, normalized size = 1.54

$$\frac{\left(12\, adxe^{(2i\, dx+2i\, c)} + i\, ae^{(2i\, dx+2i\, c)}\log\left(e^{(2i\, dx+2i\, c)} + 1\right) - i\, ae^{(2i\, dx+2i\, c)}\log\left(e^{(2i\, dx)} + e^{(-2i\, c)}\right) - i\, ae^{(6i\, dx+6i\, c)} - 6i\, ae^{(4i\, dx-}}{32\, d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/32*(12*a*d*x*e^(2*I*d*x + 2*I*c) + I*a*e^(2*I*d*x + 2*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - I*a*e^(2*I*d*x + 2*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) - I*a*e^(6*I*d*x + 6*I*c) - 6*I*a*e^(4*I*d*x + 4*I*c) + 2*I*a)*e^(-2*I*d*x - 2*I*c)/d
```

maple [A] time = 0.44, size = 53, normalized size = 0.79

$$\frac{-\frac{ia\left(\cos^4(dx+c)\right)}{4} + a\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4} + \frac{3dx}{8} + \frac{3c}{8}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4*(a+I*a*tan(d*x+c)),x)
```

```
[Out] 1/d*(-1/4*I*a*cos(d*x+c)^4+a*(1/4*(cos(d*x+c)^3+3/2*cos(d*x+c))*sin(d*x+c)+3/8*d*x+3/8*c))
```

maxima [A] time = 0.92, size = 61, normalized size = 0.91

$$\frac{3\,(dx+c)a + \frac{3\,a\tan(dx+c)^3+5\,a\tan(dx+c)-2i\,a}{\tan(dx+c)^4+2\,\tan(dx+c)^2+1}}{8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/8*(3*(d*x + c)*a + (3*a*tan(d*x + c)^3 + 5*a*tan(d*x + c) - 2*I*a)/(tan(d*x + c)^4 + 2*tan(d*x + c)^2 + 1))/d
```

mupad [B] time = 3.34, size = 64, normalized size = 0.96

$$\frac{3\,a\,x}{8} + \frac{\frac{3\,a\tan(c+d\,x)^2}{8} + \frac{3\mathrm{i}\,a\tan(c+d\,x)}{8} + \frac{a}{4}}{d\,\left(\tan\left(c+d\,x\right)^3 + \tan\left(c+d\,x\right)^2\,1\mathrm{i} + \tan\left(c+d\,x\right) + 1\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i),x)
```

```
[Out] (3*a*x)/8 + (a/4 + (a*tan(c + d*x)*3i)/8 + (3*a*tan(c + d*x)^2)/8)/(d*(tan(
c + d*x) + tan(c + d*x)^2*1i + tan(c + d*x)^3 + 1i))
```

sympy [A] time = 0.29, size = 139, normalized size = 2.07

$$\frac{3ax}{8}+\begin{cases}-\frac{\left(256iad^2e^{6ic}e^{4idx}+1536iad^2e^{4ic}e^{2idx}-512iad^2e^{-2idx}\right)e^{-2ic}}{8192d^3} & \text{for } 8192d^3e^{2ic}\neq 0\\ x\left(-\frac{3a}{8}+\frac{\left(ae^{6ic}+3ae^{4ic}+3ae^{2ic}+a\right)e^{-2ic}}{8}\right) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4*(a+I*a*tan(d*x+c)),x)
```

```
[Out] 3*a*x/8 + Piecewise((-(256*I*a*d**2*exp(6*I*c)*exp(4*I*d*x) + 1536*I*a*d**2
*exp(4*I*c)*exp(2*I*d*x) - 512*I*a*d**2*exp(-2*I*d*x))*exp(-2*I*c)/(8192*d*
*3), Ne(8192*d**3*exp(2*I*c), 0)), (x*(-3*a/8 + (a*exp(6*I*c) + 3*a*exp(4*I
*c) + 3*a*exp(2*I*c) + a)*exp(-2*I*c)/8), True))
```

3.9 $\int \cos^6(c+dx)(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=89

$$-\frac{ia\cos^6(c+dx)}{6d}+\frac{a\sin(c+dx)\cos^5(c+dx)}{6d}+\frac{5a\sin(c+dx)\cos^3(c+dx)}{24d}+\frac{5a\sin(c+dx)\cos(c+dx)}{16d}+\frac{5ax}{16}$$

```
[Out] 5/16*a*x-1/6*I*a*cos(d*x+c)^6/d+5/16*a*cos(d*x+c)*sin(d*x+c)/d+5/24*a*cos(d
*x+c)^3*sin(d*x+c)/d+1/6*a*cos(d*x+c)^5*sin(d*x+c)/d
```

Rubi [A] time = 0.05, antiderivative size = 89, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.136$, Rules used = {3486, 2635, 8}

$$-\frac{ia\cos^6(c+dx)}{6d}+\frac{a\sin(c+dx)\cos^5(c+dx)}{6d}+\frac{5a\sin(c+dx)\cos^3(c+dx)}{24d}+\frac{5a\sin(c+dx)\cos(c+dx)}{16d}+\frac{5ax}{16}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^6*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (5*a*x)/16 - ((I/6)*a*Cos[c + d*x]^6)/d + (5*a*Cos[c + d*x]*Sin[c + d*x])/(
16*d) + (5*a*Cos[c + d*x]^3*Sin[c + d*x])/(24*d) + (a*Cos[c + d*x]^5*Sin[c
+ d*x])/(6*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2635

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

Rule 3486

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

Rubi steps

$$\begin{aligned}
\int \cos^6(c+dx)(a+ia\tan(c+dx))\,dx &= -\frac{ia\cos^6(c+dx)}{6d}+a\int \cos^6(c+dx)\,dx\\
&= -\frac{ia\cos^6(c+dx)}{6d}+\frac{a\cos^5(c+dx)\sin(c+dx)}{6d}+\frac{1}{6}(5a)\int \cos^4(c+dx)\,d\\
&= -\frac{ia\cos^6(c+dx)}{6d}+\frac{5a\cos^3(c+dx)\sin(c+dx)}{24d}+\frac{a\cos^5(c+dx)\sin(c+\\
&= -\frac{ia\cos^6(c+dx)}{6d}+\frac{5a\cos(c+dx)\sin(c+dx)}{16d}+\frac{5a\cos^3(c+dx)\sin(c+\\
&= \frac{5ax}{16}-\frac{ia\cos^6(c+dx)}{6d}+\frac{5a\cos(c+dx)\sin(c+dx)}{16d}+\frac{5a\cos^3(c+dx)\mathrm{si}}{24d}
\end{aligned}$$

Mathematica [A] time = 0.06, size = 56, normalized size = 0.63

$$\frac{a\left(45\sin(2(c+dx))+9\sin(4(c+dx))+\sin(6(c+dx))-32i\cos^6(c+dx)+60c+60dx\right)}{192d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^6*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (a*(60*c + 60*d*x - (32*I)*Cos[c + d*x]^6 + 45*Sin[2*(c + d*x)] + 9*Sin[4*(
c + d*x)] + Sin[6*(c + d*x)]))/(192*d)
```

fricas [A] time = 0.48, size = 80, normalized size = 0.90

$$\frac{\left(120\,adxe^{(4i\,dx+4i\,c)}-2i\,ae^{(10i\,dx+10i\,c)}-15i\,ae^{(8i\,dx+8i\,c)}-60i\,ae^{(6i\,dx+6i\,c)}+30i\,ae^{(2i\,dx+2i\,c)}+3i\,a\right)e^{(-4i\,dx-4i\,c)}}{384\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/384*(120*a*d*x*e^(4*I*d*x + 4*I*c) - 2*I*a*e^(10*I*d*x + 10*I*c) - 15*I*a
*e^(8*I*d*x + 8*I*c) - 60*I*a*e^(6*I*d*x + 6*I*c) + 30*I*a*e^(2*I*d*x + 2*I
*c) + 3*I*a)*e^(-4*I*d*x - 4*I*c)/d
```

giac [A] time = 0.76, size = 127, normalized size = 1.43

$$\frac{\left(120\,adxe^{(4i\,dx+2i\,c)}+12i\,ae^{(4i\,dx+2i\,c)}\log\left(e^{(2i\,dx+2i\,c)}+1\right)-12i\,ae^{(4i\,dx+2i\,c)}\log\left(e^{(2i\,dx)}+e^{(-2i\,c)}\right)-2i\,ae^{(10i\,dx+8i\,c)}}{384\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/384*(120*a*d*x*e^(4*I*d*x + 2*I*c) + 12*I*a*e^(4*I*d*x + 2*I*c)*log(e^(2*
I*d*x + 2*I*c) + 1) - 12*I*a*e^(4*I*d*x + 2*I*c)*log(e^(2*I*d*x) + e^(-2*I*
c)) - 2*I*a*e^(10*I*d*x + 8*I*c) - 15*I*a*e^(8*I*d*x + 6*I*c) - 60*I*a*e^(6
*I*d*x + 4*I*c) + 30*I*a*e^(2*I*d*x) + 3*I*a*e^(-2*I*c))*e^(-4*I*d*x - 2*I*
c)/d
```

maple [A] time = 0.44, size = 63, normalized size = 0.71

$$\frac{-\frac{ia\left(\cos^{6}(dx+c)\right)}{6}+a\left(\frac{\left(\cos^{5}(dx+c)+\frac{5\left(\cos^{3}(dx+c)\right)}{4}+\frac{15\cos(dx+c)}{8}\right)\sin(dx+c)}{6}+\frac{5dx}{16}+\frac{5c}{16}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^6*(a+I*a*tan(d*x+c)),x)
```

```
[Out] 1/d*(-1/6*I*a*cos(d*x+c)^6+a*(1/6*(cos(d*x+c)^5+5/4*cos(d*x+c)^3+15/8*cos(d
*x+c))*sin(d*x+c)+5/16*d*x+5/16*c))
```

maxima [A] time = 0.85, size = 82, normalized size = 0.92

$$\frac{15\,(dx+c)a+\frac{15\,a\tan(dx+c)^{5}+40\,a\tan(dx+c)^{3}+33\,a\tan(dx+c)-8i\,a}{\tan(dx+c)^{6}+3\,\tan(dx+c)^{4}+3\,\tan(dx+c)^{2}+1}}{48\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/48*(15*(d*x + c)*a + (15*a*tan(d*x + c)^5 + 40*a*tan(d*x + c)^3 + 33*a*ta
n(d*x + c) - 8*I*a)/(tan(d*x + c)^6 + 3*tan(d*x + c)^4 + 3*tan(d*x + c)^2 +
 1))/d
```

mupad [B] time = 3.57, size = 108, normalized size = 1.21

$$\frac{5\,a\,x}{16}+\frac{\frac{5\,a\,\tan(c+d\,x)^4}{16}+\frac{5\mathrm{i}\,a\,\tan(c+d\,x)^3}{16}+\frac{25\,a\,\tan(c+d\,x)^2}{48}+\frac{25\mathrm{i}\,a\,\tan(c+d\,x)}{48}+\frac{a}{6}}{d\,\left(\tan\left(c+d\,x\right)^5+\tan\left(c+d\,x\right)^4\,1\mathrm{i}+2\,\tan\left(c+d\,x\right)^3+\tan\left(c+d\,x\right)^2\,2\mathrm{i}+\tan\left(c+d\,x\right)+1\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i),x)
```

```
[Out] (5*a*x)/16 + (a/6 + (a*tan(c + d*x)*25i)/48 + (25*a*tan(c + d*x)^2)/48 + (a
*tan(c + d*x)^3*5i)/16 + (5*a*tan(c + d*x)^4)/16)/(d*(tan(c + d*x) + tan(c
+ d*x)^2*2i + 2*tan(c + d*x)^3 + tan(c + d*x)^4*1i + tan(c + d*x)^5 + 1i))
```

sympy [A] time = 0.41, size = 214, normalized size = 2.40

$$\frac{5ax}{16}+\begin{cases} -\frac{\left(33554432iad^4e^{12ic}e^{6idx}+251658240iad^4e^{10ic}e^{4idx}+1006632960iad^4e^{8ic}e^{2idx}-503316480iad^4e^{4ic}e^{-2idx}-50331648iad^4e^{2ic}e^{-4idx}\right)e^{-6ic}}{6442450944d^5} & \text{fo} \\ x\left(-\frac{5a}{16}+\frac{\left(ae^{10ic}+5ae^{8ic}+10ae^{6ic}+10ae^{4ic}+5ae^{2ic}+a\right)e^{-4ic}}{32}\right) & \text{ot} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**6*(a+I*a*tan(d*x+c)),x)
```

```
[Out] 5*a*x/16 + Piecewise((-(33554432*I*a*d**4*exp(12*I*c)*exp(6*I*d*x) + 251658
240*I*a*d**4*exp(10*I*c)*exp(4*I*d*x) + 1006632960*I*a*d**4*exp(8*I*c)*exp(
2*I*d*x) - 503316480*I*a*d**4*exp(4*I*c)*exp(-2*I*d*x) - 50331648*I*a*d**4*
exp(2*I*c)*exp(-4*I*d*x))*exp(-6*I*c)/(6442450944*d**5), Ne(6442450944*d**5
*exp(6*I*c), 0)), (x*(-5*a/16 + (a*exp(10*I*c) + 5*a*exp(8*I*c) + 10*a*exp(
6*I*c) + 10*a*exp(4*I*c) + 5*a*exp(2*I*c) + a)*exp(-4*I*c)/32), True))
```

3.10 $\int \cos^8(c+dx)(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=111

$$-\frac{ia\cos^8(c+dx)}{8d}+\frac{a\sin(c+dx)\cos^7(c+dx)}{8d}+\frac{7a\sin(c+dx)\cos^5(c+dx)}{48d}+\frac{35a\sin(c+dx)\cos^3(c+dx)}{192d}+\frac{35a}{}$$

```
[Out] 35/128*a*x-1/8*I*a*cos(d*x+c)^8/d+35/128*a*cos(d*x+c)*sin(d*x+c)/d+35/192*a
*cos(d*x+c)^3*sin(d*x+c)/d+7/48*a*cos(d*x+c)^5*sin(d*x+c)/d+1/8*a*cos(d*x+c
)^7*sin(d*x+c)/d
```

Rubi [A] time = 0.07, antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.136$, Rules used = $\{3486, 2635, 8\}$

$$-\frac{ia\cos^8(c+dx)}{8d}+\frac{a\sin(c+dx)\cos^7(c+dx)}{8d}+\frac{7a\sin(c+dx)\cos^5(c+dx)}{48d}+\frac{35a\sin(c+dx)\cos^3(c+dx)}{192d}+\frac{35a}{}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^8*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (35*a*x)/128 - ((I/8)*a*Cos[c + d*x]^8)/d + (35*a*Cos[c + d*x]*Sin[c + d*x]
)/(128*d) + (35*a*Cos[c + d*x]^3*Sin[c + d*x])/(192*d) + (7*a*Cos[c + d*x]^
5*Sin[c + d*x])/(48*d) + (a*Cos[c + d*x]^7*Sin[c + d*x])/(8*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2635

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

Rule 3486

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

Rubi steps

$$\begin{aligned}
\int \cos^8(c+dx)(a+ia\tan(c+dx))\,dx &= -\frac{ia\cos^8(c+dx)}{8d}+a\int \cos^8(c+dx)\,dx\\
&= -\frac{ia\cos^8(c+dx)}{8d}+\frac{a\cos^7(c+dx)\sin(c+dx)}{8d}+\frac{1}{8}(7a)\int \cos^6(c+dx
\\
&= -\frac{ia\cos^8(c+dx)}{8d}+\frac{7a\cos^5(c+dx)\sin(c+dx)}{48d}+\frac{a\cos^7(c+dx)\sin(
}{8d}\\
&= -\frac{ia\cos^8(c+dx)}{8d}+\frac{35a\cos^3(c+dx)\sin(c+dx)}{192d}+\frac{7a\cos^5(c+dx)\mathrm{si}
}{48d}\\
&= -\frac{ia\cos^8(c+dx)}{8d}+\frac{35a\cos(c+dx)\sin(c+dx)}{128d}+\frac{35a\cos^3(c+dx)\mathrm{si}
}{192d}\\
&= \frac{35ax}{128}-\frac{ia\cos^8(c+dx)}{8d}+\frac{35a\cos(c+dx)\sin(c+dx)}{128d}+\frac{35a\cos^3(c+
}{1}
\end{aligned}$$

Mathematica [A] time = 0.13, size = 68, normalized size = 0.61

$$\frac{a\left(672\sin(2(c+dx))+168\sin(4(c+dx))+32\sin(6(c+dx))+3\sin(8(c+dx))-384i\cos^8(c+dx)+840c+84\right.}{3072d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^8*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (a*(840*c + 840*d*x - (384*I)*Cos[c + d*x]^8 + 672*Sin[2*(c + d*x)] + 168*S
in[4*(c + d*x)] + 32*Sin[6*(c + d*x)] + 3*Sin[8*(c + d*x)]))/(3072*d)
```

fricas [A] time = 0.54, size = 104, normalized size = 0.94

$$\frac{\left(840\,adxe^{(6i\,dx+6i\,c)}-3i\,ae^{(14i\,dx+14i\,c)}-28i\,ae^{(12i\,dx+12i\,c)}-126i\,ae^{(10i\,dx+10i\,c)}-420i\,ae^{(8i\,dx+8i\,c)}+252i\,ae^{(4i\,dx+4i\,c)}+\right.}{3072\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^8*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/3072*(840*a*d*x*e^(6*I*d*x + 6*I*c) - 3*I*a*e^(14*I*d*x + 14*I*c) - 28*I*
a*e^(12*I*d*x + 12*I*c) - 126*I*a*e^(10*I*d*x + 10*I*c) - 420*I*a*e^(8*I*d*
x + 8*I*c) + 252*I*a*e^(4*I*d*x + 4*I*c) + 42*I*a*e^(2*I*d*x + 2*I*c) + 4*I
*a)*e^(-6*I*d*x - 6*I*c)/d
```

giac [A] time = 0.72, size = 151, normalized size = 1.36

$$\frac{\left(840\,adxe^{(6i\,dx+2i\,c)}+84i\,ae^{(6i\,dx+2i\,c)}\log\left(e^{(2i\,dx+2i\,c)}+1\right)-84i\,ae^{(6i\,dx+2i\,c)}\log\left(e^{(2i\,dx)}+e^{(-2i\,c)}\right)-3i\,ae^{(14i\,dx+10i\,c)}-\right.}{3072\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^8*(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/3072*(840*a*d*x*e^(6*I*d*x + 2*I*c) + 84*I*a*e^(6*I*d*x + 2*I*c)*log(e^(2
*I*d*x + 2*I*c) + 1) - 84*I*a*e^(6*I*d*x + 2*I*c)*log(e^(2*I*d*x) + e^(-2*I
*c)) - 3*I*a*e^(14*I*d*x + 10*I*c) - 28*I*a*e^(12*I*d*x + 8*I*c) - 126*I*a*
e^(10*I*d*x + 6*I*c) - 420*I*a*e^(8*I*d*x + 4*I*c) + 42*I*a*e^(2*I*d*x - 2*
I*c) + 252*I*a*e^(4*I*d*x) + 4*I*a*e^(-4*I*c))*e^(-6*I*d*x - 2*I*c)/d
```

maple [A] time = 0.44, size = 73, normalized size = 0.66

$$\frac{-\frac{ia\left(\cos^8(dx+c)\right)}{8}+a\left(\frac{\left(\cos^7(dx+c)+\frac{7\left(\cos^5(dx+c)\right)}{6}+\frac{35\left(\cos^3(dx+c)\right)}{24}+\frac{35\cos(dx+c)}{16}\right)\sin(dx+c)}{8}+\frac{35dx}{128}+\frac{35c}{128}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^8*(a+I*a*tan(d*x+c)),x)
```

```
[Out] 1/d*(-1/8*I*a*cos(d*x+c)^8+a*(1/8*(cos(d*x+c)^7+7/6*cos(d*x+c)^5+35/24*cos(
d*x+c)^3+35/16*cos(d*x+c))*sin(d*x+c)+35/128*d*x+35/128*c))
```

maxima [A] time = 0.93, size = 103, normalized size = 0.93

$$\frac{105\,(dx+c)a+\frac{105\,a\tan(dx+c)^7+385\,a\tan(dx+c)^5+511\,a\tan(dx+c)^3+279\,a\tan(dx+c)-48i\,a}{\tan(dx+c)^8+4\,\tan(dx+c)^6+6\,\tan(dx+c)^4+4\,\tan(dx+c)^2+1}}{384\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^8*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/384*(105*(d*x + c)*a + (105*a*tan(d*x + c)^7 + 385*a*tan(d*x + c)^5 + 511
*a*tan(d*x + c)^3 + 279*a*tan(d*x + c) - 48*I*a)/(tan(d*x + c)^8 + 4*tan(d*
x + c)^6 + 6*tan(d*x + c)^4 + 4*tan(d*x + c)^2 + 1))/d
```

mupad [B] time = 4.85, size = 152, normalized size = 1.37

$$\frac{35\,a\,x}{128}+\frac{\frac{35\,a\,\tan(c+d\,x)^6}{128}+\frac{35\mathrm{i}\,a\,\tan(c+d\,x)^5}{128}+\frac{35\,a\,\tan(c+d\,x)^4}{48}+\frac{35\mathrm{i}\,a\,\tan(c+d\,x)^3}{48}+\frac{77\,a\,\tan(c+d\,x)^2}{128}+\frac{77\mathrm{i}\,a\,\tan(}{128}}{d\,\left(\tan\left(c+d\,x\right)^7+\tan\left(c+d\,x\right)^6\,1\mathrm{i}+3\,\tan\left(c+d\,x\right)^5+\tan\left(c+d\,x\right)^4\,3\mathrm{i}+3\,\tan\left(c+d\,x\right)^3+\tan\left(c+d\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^8*(a + a*tan(c + d*x)*1i),x)
```

```
[Out] (35*a*x)/128 + (a/8 + (a*tan(c + d*x)*77i)/128 + (77*a*tan(c + d*x)^2)/128
+ (a*tan(c + d*x)^3*35i)/48 + (35*a*tan(c + d*x)^4)/48 + (a*tan(c + d*x)^5*
35i)/128 + (35*a*tan(c + d*x)^6)/128)/(d*(tan(c + d*x) + tan(c + d*x)^2*3i
+ 3*tan(c + d*x)^3 + tan(c + d*x)^4*3i + 3*tan(c + d*x)^5 + tan(c + d*x)^6*
1i + tan(c + d*x)^7 + 1i))
```

sympy [A] time = 0.53, size = 282, normalized size = 2.54

$$\frac{35ax}{128}+\begin{cases}-\frac{\left(10133099161583616iad^6e^{20ic}e^{8idx}+94575592174780416iad^6e^{18ic}e^{6idx}+425590164786511872iad^6e^{16ic}e^{4idx}+1418633882621706240i\right.}{1037629354146} \\ x\left(-\frac{35a}{128}+\frac{\left(ae^{14ic}+7ae^{12ic}+21ae^{10ic}+35ae^{8ic}+35ae^{6ic}+21ae^{4ic}+7ae^{2ic}+a\right)e^{-6ic}}{128}\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**8*(a+I*a*tan(d*x+c)),x)
```

```
[Out] 35*a*x/128 + Piecewise((-(10133099161583616*I*a*d**6*exp(20*I*c)*exp(8*I*d*
x) + 94575592174780416*I*a*d**6*exp(18*I*c)*exp(6*I*d*x) + 4255901647865118
72*I*a*d**6*exp(16*I*c)*exp(4*I*d*x) + 1418633882621706240*I*a*d**6*exp(14*
I*c)*exp(2*I*d*x) - 851180329573023744*I*a*d**6*exp(10*I*c)*exp(-2*I*d*x) -
 141863388262170624*I*a*d**6*exp(8*I*c)*exp(-4*I*d*x) - 13510798882111488*I
*a*d**6*exp(6*I*c)*exp(-6*I*d*x))*exp(-12*I*c)/(1037629354146162278 4*d**7),
 Ne(1037629354146162278 4*d**7*exp(12*I*c), 0)), (x*(-35*a/128 + (a*exp(14*I
*c) + 7*a*exp(12*I*c) + 21*a*exp(10*I*c) + 35*a*exp(8*I*c) + 35*a*exp(6*I*c
) + 21*a*exp(4*I*c) + 7*a*exp(2*I*c) + a)*exp(-6*I*c)/128), True))
```

3.11 $\int \sec^7(c+dx)(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=98

$$\frac{ia\sec^7(c+dx)}{7d}+\frac{5a\tanh^{-1}(\sin(c+dx))}{16d}+\frac{a\tan(c+dx)\sec^5(c+dx)}{6d}+\frac{5a\tan(c+dx)\sec^3(c+dx)}{24d}+\frac{5a\tan(c+dx)}{16}$$

```
[Out] 5/16*a*arctanh(sin(d*x+c))/d+1/7*I*a*sec(d*x+c)^7/d+5/16*a*sec(d*x+c)*tan(d
*x+c)/d+5/24*a*sec(d*x+c)^3*tan(d*x+c)/d+1/6*a*sec(d*x+c)^5*tan(d*x+c)/d
```

Rubi [A] time = 0.06, antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {3486, 3768, 3770}

$$\frac{ia\sec^7(c+dx)}{7d}+\frac{5a\tanh^{-1}(\sin(c+dx))}{16d}+\frac{a\tan(c+dx)\sec^5(c+dx)}{6d}+\frac{5a\tan(c+dx)\sec^3(c+dx)}{24d}+\frac{5a\tan(c+dx)}{16}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^7*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (5*a*ArcTanh[Sin[c + d*x]])/(16*d) + ((I/7)*a*Sec[c + d*x]^7)/d + (5*a*Sec[
c + d*x]*Tan[c + d*x])/(16*d) + (5*a*Sec[c + d*x]^3*Tan[c + d*x])/(24*d) +
(a*Sec[c + d*x]^5*Tan[c + d*x])/(6*d)
```

Rule 3486

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

Rule 3768

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\int \sec^7(c+dx)(a+ia\tan(c+dx))\,dx &= \frac{ia\sec^7(c+dx)}{7d}+a\int \sec^7(c+dx)\,dx\\
&= \frac{ia\sec^7(c+dx)}{7d}+\frac{a\sec^5(c+dx)\tan(c+dx)}{6d}+\frac{1}{6}(5a)\int \sec^5(c+dx)\,dx\\
&= \frac{ia\sec^7(c+dx)}{7d}+\frac{5a\sec^3(c+dx)\tan(c+dx)}{24d}+\frac{a\sec^5(c+dx)\tan(c+d}{6d}\\
&= \frac{ia\sec^7(c+dx)}{7d}+\frac{5a\sec(c+dx)\tan(c+dx)}{16d}+\frac{5a\sec^3(c+dx)\tan(c+d}{24d}\\
&= \frac{5a\tanh^{-1}(\sin(c+dx))}{16d}+\frac{ia\sec^7(c+dx)}{7d}+\frac{5a\sec(c+dx)\tan(c+dx)}{16d}+
\end{aligned}$$

Mathematica [A] time = 0.31, size = 61, normalized size = 0.62

$$\frac{a\left(3360\tanh^{-1}(\sin(c+dx))+(1981\sin(2(c+dx))+700\sin(4(c+dx))+105\sin(6(c+dx))+1536i)\sec^7(c+dx)\right)}{10752d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^7*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (a*(3360*ArcTanh[Sin[c + d*x]] + Sec[c + d*x]^7*(1536*I + 1981*Sin[2*(c + d
*x)] + 700*Sin[4*(c + d*x)] + 105*Sin[6*(c + d*x)])))/(10752*d)
```

fricas [B] time = 0.54, size = 372, normalized size = 3.80

$$\frac{-210i\,ae^{(13i\,dx+13i\,c)}-1400i\,ae^{(11i\,dx+11i\,c)}-3962i\,ae^{(9i\,dx+9i\,c)}+6144i\,ae^{(7i\,dx+7i\,c)}+3962i\,ae^{(5i\,dx+5i\,c)}+1400i\,ae^{(}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/336*(-210*I*a*e^(13*I*d*x + 13*I*c) - 1400*I*a*e^(11*I*d*x + 11*I*c) - 39
62*I*a*e^(9*I*d*x + 9*I*c) + 6144*I*a*e^(7*I*d*x + 7*I*c) + 3962*I*a*e^(5*I
*d*x + 5*I*c) + 1400*I*a*e^(3*I*d*x + 3*I*c) + 210*I*a*e^(I*d*x + I*c) + 10
5*(a*e^(14*I*d*x + 14*I*c) + 7*a*e^(12*I*d*x + 12*I*c) + 21*a*e^(10*I*d*x +
 10*I*c) + 35*a*e^(8*I*d*x + 8*I*c) + 35*a*e^(6*I*d*x + 6*I*c) + 21*a*e^(4*
I*d*x + 4*I*c) + 7*a*e^(2*I*d*x + 2*I*c) + a)*log(e^(I*d*x + I*c) + I) - 10
5*(a*e^(14*I*d*x + 14*I*c) + 7*a*e^(12*I*d*x + 12*I*c) + 21*a*e^(10*I*d*x +
 10*I*c) + 35*a*e^(8*I*d*x + 8*I*c) + 35*a*e^(6*I*d*x + 6*I*c) + 21*a*e^(4*
I*d*x + 4*I*c) + 7*a*e^(2*I*d*x + 2*I*c) + a)*log(e^(I*d*x + I*c) - I))/(d*
e^(14*I*d*x + 14*I*c) + 7*d*e^(12*I*d*x + 12*I*c) + 21*d*e^(10*I*d*x + 10*I
*c) + 35*d*e^(8*I*d*x + 8*I*c) + 35*d*e^(6*I*d*x + 6*I*c) + 21*d*e^(4*I*d*x
 + 4*I*c) + 7*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [B] time = 2.25, size = 181, normalized size = 1.85

$$\frac{105\,a\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)-105\,a\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)+\frac{2\left(231\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{13}-336i\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{12}-196}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7*(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/336*(105*a*log(tan(1/2*d*x + 1/2*c) + 1) - 105*a*log(tan(1/2*d*x + 1/2*c)
 - 1) + 2*(231*a*tan(1/2*d*x + 1/2*c)^13 - 336*I*a*tan(1/2*d*x + 1/2*c)^12
- 196*a*tan(1/2*d*x + 1/2*c)^11 + 595*a*tan(1/2*d*x + 1/2*c)^9 - 1680*I*a*t
an(1/2*d*x + 1/2*c)^8 - 595*a*tan(1/2*d*x + 1/2*c)^5 - 1008*I*a*tan(1/2*d*x
 + 1/2*c)^4 + 196*a*tan(1/2*d*x + 1/2*c)^3 - 231*a*tan(1/2*d*x + 1/2*c) - 4
8*I*a)/(tan(1/2*d*x + 1/2*c)^2 - 1)^7)/d
```

maple [A] time = 0.45, size = 95, normalized size = 0.97

$$\frac{ia}{7d\cos(dx+c)^7}+\frac{a\left(\sec^5(dx+c)\right)\tan(dx+c)}{6d}+\frac{5a\left(\sec^3(dx+c)\right)\tan(dx+c)}{24d}+\frac{5a\sec(dx+c)\tan(dx+c)}{16d}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^7*(a+I*a*tan(d*x+c)),x)
```

[Out] 1/7*I/d*a/cos(d*x+c)^7+1/6*a*sec(d*x+c)^5*tan(d*x+c)/d+5/24*a*sec(d*x+c)^3*tan(d*x+c)/d+5/16*a*sec(d*x+c)*tan(d*x+c)/d+5/16/d*a*ln(sec(d*x+c)+tan(d*x+c))

maxima [A] time = 0.35, size = 106, normalized size = 1.08

$$-\frac{7\,a\left(\frac{2\left(15\,\sin(dx+c)^5-40\,\sin(dx+c)^3+33\,\sin(dx+c)\right)}{\sin(dx+c)^6-3\,\sin(dx+c)^4+3\,\sin(dx+c)^2-1}-15\,\log\left(\sin\left(dx+c\right)+1\right)+15\,\log\left(\sin\left(dx+c\right)-1\right)\right)-\frac{96i\,a}{\cos(dx+c)^7}}{672\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sec(d*x+c)^7*(a+I*a*tan(d*x+c)),x, algorithm="maxima")

[Out] -1/672*(7*a*(2*(15*sin(d*x + c)^5 - 40*sin(d*x + c)^3 + 33*sin(d*x + c))/(sin(d*x + c)^6 - 3*sin(d*x + c)^4 + 3*sin(d*x + c)^2 - 1) - 15*log(sin(d*x + c) + 1) + 15*log(sin(d*x + c) - 1)) - 96*I*a/cos(d*x + c)^7)/d

mupad [B] time = 7.37, size = 247, normalized size = 2.52

$$\frac{5\,a\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{8\,d}-\frac{-\frac{11\,a\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{13}}{8}+2\mathrm{i}\,a\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{12}+\frac{7\,a\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{11}}{6}-\frac{85\,a\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{9}}{24}+10\mathrm{i}\,a\,\tan\left(\frac{c}{2}+\right.}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{14}-7\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{12}+21\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}-35\,\tan\left(\frac{c}{2}+\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a + a*tan(c + d*x)*1i)/cos(c + d*x)^7,x)

[Out] (5*a*atanh(tan(c/2 + (d*x)/2)))/(8*d) - ((a*2i)/7 + (11*a*tan(c/2 + (d*x)/2))/8 - (7*a*tan(c/2 + (d*x)/2)^3)/6 + a*tan(c/2 + (d*x)/2)^4*6i + (85*a*tan(c/2 + (d*x)/2)^5)/24 + a*tan(c/2 + (d*x)/2)^8*10i - (85*a*tan(c/2 + (d*x)/2)^9)/24 + (7*a*tan(c/2 + (d*x)/2)^11)/6 + a*tan(c/2 + (d*x)/2)^12*2i - (11*a*tan(c/2 + (d*x)/2)^13)/8)/(d*(7*tan(c/2 + (d*x)/2)^2 - 21*tan(c/2 + (d*x)/2)^4 + 35*tan(c/2 + (d*x)/2)^6 - 35*tan(c/2 + (d*x)/2)^8 + 21*tan(c/2 + (d*x)/2)^10 - 7*tan(c/2 + (d*x)/2)^12 + tan(c/2 + (d*x)/2)^14 - 1))

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

$$ia\left(\int\left(-i\sec^7\left(c+dx\right)\right)dx+\int\tan\left(c+dx\right)\sec^7\left(c+dx\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sec(d*x+c)**7*(a+I*a*tan(d*x+c)),x)

[Out] I*a*(Integral(-I*sec(c + d*x)**7, x) + Integral(tan(c + d*x)*sec(c + d*x)**7, x))

3.12 $\int \sec^5(c+dx)(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=76

$$\frac{ia\sec^5(c+dx)}{5d}+\frac{3a\tanh^{-1}(\sin(c+dx))}{8d}+\frac{a\tan(c+dx)\sec^3(c+dx)}{4d}+\frac{3a\tan(c+dx)\sec(c+dx)}{8d}$$

```
[Out] 3/8*a*arctanh(sin(d*x+c))/d+1/5*I*a*sec(d*x+c)^5/d+3/8*a*sec(d*x+c)*tan(d*x
+c)/d+1/4*a*sec(d*x+c)^3*tan(d*x+c)/d
```

Rubi [A] time = 0.05, antiderivative size = 76, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {3486, 3768, 3770}

$$\frac{ia\sec^5(c+dx)}{5d}+\frac{3a\tanh^{-1}(\sin(c+dx))}{8d}+\frac{a\tan(c+dx)\sec^3(c+dx)}{4d}+\frac{3a\tan(c+dx)\sec(c+dx)}{8d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^5*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (3*a*ArcTanh[Sin[c + d*x]])/(8*d) + ((I/5)*a*Sec[c + d*x]^5)/d + (3*a*Sec[c
 + d*x]*Tan[c + d*x])/(8*d) + (a*Sec[c + d*x]^3*Tan[c + d*x])/(4*d)
```

Rule 3486

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

Rule 3768

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\int \sec^5(c+dx)(a+ia\tan(c+dx))\,dx &= \frac{ia\sec^5(c+dx)}{5d}+a\int \sec^5(c+dx)\,dx\\
&= \frac{ia\sec^5(c+dx)}{5d}+\frac{a\sec^3(c+dx)\tan(c+dx)}{4d}+\frac{1}{4}(3a)\int \sec^3(c+dx)\,d\\
&= \frac{ia\sec^5(c+dx)}{5d}+\frac{3a\sec(c+dx)\tan(c+dx)}{8d}+\frac{a\sec^3(c+dx)\tan(c+}{4d}\\
&= \frac{3a\tanh^{-1}(\sin(c+dx))}{8d}+\frac{ia\sec^5(c+dx)}{5d}+\frac{3a\sec(c+dx)\tan(c+dx}{8d}
\end{aligned}$$

Mathematica [A] time = 0.17, size = 70, normalized size = 0.92

$$\frac{ia\sec^5(c+dx)}{5d}+\frac{a\tan(c+dx)\sec^3(c+dx)}{4d}+\frac{3a\left(\tanh^{-1}(\sin(c+dx))+\tan(c+dx)\sec(c+dx)\right)}{8d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^5*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((I/5)*a*Sec[c + d*x]^5)/d + (a*Sec[c + d*x]^3*Tan[c + d*x])/(4*d) + (3*a*(
ArcTanh[Sin[c + d*x]] + Sec[c + d*x]*Tan[c + d*x]))/(8*d)
```

fricas [B] time = 0.45, size = 276, normalized size = 3.63

$$\frac{-30i\,ae^{(9i\,dx+9i\,c)} - 140i\,ae^{(7i\,dx+7i\,c)} + 256i\,ae^{(5i\,dx+5i\,c)} + 140i\,ae^{(3i\,dx+3i\,c)} + 30i\,ae^{(i\,dx+i\,c)} + 15\left(ae^{(10i\,dx+10i\,c)} + 5\,ae^{(8}\right.}{40\left(de^{(1\right.}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/40*(-30*I*a*e^(9*I*d*x + 9*I*c) - 140*I*a*e^(7*I*d*x + 7*I*c) + 256*I*a*e
^(5*I*d*x + 5*I*c) + 140*I*a*e^(3*I*d*x + 3*I*c) + 30*I*a*e^(I*d*x + I*c) +
 15*(a*e^(10*I*d*x + 10*I*c) + 5*a*e^(8*I*d*x + 8*I*c) + 10*a*e^(6*I*d*x +
6*I*c) + 10*a*e^(4*I*d*x + 4*I*c) + 5*a*e^(2*I*d*x + 2*I*c) + a)*log(e^(I*d
*x + I*c) + I) - 15*(a*e^(10*I*d*x + 10*I*c) + 5*a*e^(8*I*d*x + 8*I*c) + 10
*a*e^(6*I*d*x + 6*I*c) + 10*a*e^(4*I*d*x + 4*I*c) + 5*a*e^(2*I*d*x + 2*I*c)
 + a)*log(e^(I*d*x + I*c) - I))/(d*e^(10*I*d*x + 10*I*c) + 5*d*e^(8*I*d*x +
 8*I*c) + 10*d*e^(6*I*d*x + 6*I*c) + 10*d*e^(4*I*d*x + 4*I*c) + 5*d*e^(2*I*
d*x + 2*I*c) + d)
```

giac [B] time = 0.71, size = 139, normalized size = 1.83

$$\frac{15\,a\log\left(\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) + 1\right) - 15\,a\log\left(\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) - 1\right) + \frac{2\left(25\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{9} - 40i\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{8} - 10\,a\tan\left(\frac{1}{2}\,dx+\right.\right.}{\left(\tan\right.}}{40\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/40*(15*a*log(tan(1/2*d*x + 1/2*c) + 1) - 15*a*log(tan(1/2*d*x + 1/2*c) -
1) + 2*(25*a*tan(1/2*d*x + 1/2*c)^9 - 40*I*a*tan(1/2*d*x + 1/2*c)^8 - 10*a*
tan(1/2*d*x + 1/2*c)^7 - 80*I*a*tan(1/2*d*x + 1/2*c)^4 + 10*a*tan(1/2*d*x +
 1/2*c)^3 - 25*a*tan(1/2*d*x + 1/2*c) - 8*I*a)/(tan(1/2*d*x + 1/2*c)^2 - 1)
^5)/d
```

maple [A] time = 0.44, size = 75, normalized size = 0.99

$$\frac{ia}{5d\cos\left(dx+c\right)^{5}} + \frac{a\left(\sec^{3}\left(dx+c\right)\right)\tan\left(dx+c\right)}{4d} + \frac{3a\sec\left(dx+c\right)\tan\left(dx+c\right)}{8d} + \frac{3a\ln\left(\sec\left(dx+c\right)+\tan\left(dx+c\right)\right)}{8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^5*(a+I*a*tan(d*x+c)),x)
```

```
[Out] 1/5*I/d*a/cos(d*x+c)^5+1/4*a*sec(d*x+c)^3*tan(d*x+c)/d+3/8*a*sec(d*x+c)*tan
(d*x+c)/d+3/8/d*a*ln(sec(d*x+c)+tan(d*x+c))
```

maxima [A] time = 0.32, size = 86, normalized size = 1.13

$$-\frac{5\,a\left(\frac{2\left(3\,\sin\left(dx+c\right)^{3}-5\,\sin\left(dx+c\right)\right)}{\sin\left(dx+c\right)^{4}-2\,\sin\left(dx+c\right)^{2}+1} - 3\,\log\left(\sin\left(dx+c\right)+1\right) + 3\,\log\left(\sin\left(dx+c\right)-1\right)\right) - \frac{16i\,a}{\cos\left(dx+c\right)^{5}}}{80\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/80*(5*a*(2*(3*sin(d*x + c)^3 - 5*sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(d
*x + c)^2 + 1) - 3*log(sin(d*x + c) + 1) + 3*log(sin(d*x + c) - 1)) - 16*I*
a/cos(d*x + c)^5)/d
```

mupad [B] time = 6.90, size = 178, normalized size = 2.34

$$\frac{3\,a\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{4\,d}-\frac{-\frac{5\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9}{4}+2\mathrm{i}\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8+\frac{a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{2}+4\mathrm{i}\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-\frac{a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{2}}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}-5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8+10\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6-10\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+5\,\mathrm{t}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)/cos(c + d*x)^5,x)
```

```
[Out] (3*a*atanh(tan(c/2 + (d*x)/2)))/(4*d) - ((a*2i)/5 + (5*a*tan(c/2 + (d*x)/2)
)/4 - (a*tan(c/2 + (d*x)/2)^3)/2 + a*tan(c/2 + (d*x)/2)^4*4i + (a*tan(c/2 +
 (d*x)/2)^7)/2 + a*tan(c/2 + (d*x)/2)^8*2i - (5*a*tan(c/2 + (d*x)/2)^9)/4)/
(d*(5*tan(c/2 + (d*x)/2)^2 - 10*tan(c/2 + (d*x)/2)^4 + 10*tan(c/2 + (d*x)/2
)^6 - 5*tan(c/2 + (d*x)/2)^8 + tan(c/2 + (d*x)/2)^10 - 1))
```

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

$$ia\left(\int\left(-i\sec^5\left(c+dx\right)\right)dx+\int\tan\left(c+dx\right)\sec^5\left(c+dx\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**5*(a+I*a*tan(d*x+c)),x)
```

```
[Out] I*a*(Integral(-I*sec(c + d*x)**5, x) + Integral(tan(c + d*x)*sec(c + d*x)**
5, x))
```

3.13 $\int \sec^3(c+dx)(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=54

$$\frac{ia\sec^3(c+dx)}{3d}+\frac{a\tanh^{-1}(\sin(c+dx))}{2d}+\frac{a\tan(c+dx)\sec(c+dx)}{2d}$$

```
[Out] 1/2*a*arctanh(sin(d*x+c))/d+1/3*I*a*sec(d*x+c)^3/d+1/2*a*sec(d*x+c)*tan(d*x
+c)/d
```

Rubi [A] time = 0.04, antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {3486, 3768, 3770}

$$\frac{ia\sec^3(c+dx)}{3d}+\frac{a\tanh^{-1}(\sin(c+dx))}{2d}+\frac{a\tan(c+dx)\sec(c+dx)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (a*ArcTanh[Sin[c + d*x]])/(2*d) + ((I/3)*a*Sec[c + d*x]^3)/d + (a*Sec[c + d
*x]*Tan[c + d*x])/(2*d)
```

Rule 3486

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

Rule 3768

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\int \sec^3(c+dx)(a+ia\tan(c+dx))\,dx &= \frac{ia\sec^3(c+dx)}{3d}+a\int \sec^3(c+dx)\,dx\\ &= \frac{ia\sec^3(c+dx)}{3d}+\frac{a\sec(c+dx)\tan(c+dx)}{2d}+\frac{1}{2}a\int \sec(c+dx)\,dx\\ &= \frac{a\tanh^{-1}(\sin(c+dx))}{2d}+\frac{ia\sec^3(c+dx)}{3d}+\frac{a\sec(c+dx)\tan(c+dx)}{2d}\end{aligned}$$

Mathematica [A] time = 0.02, size = 54, normalized size = 1.00

$$\frac{ia\sec^3(c+dx)}{3d}+\frac{a\tanh^{-1}(\sin(c+dx))}{2d}+\frac{a\tan(c+dx)\sec(c+dx)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^3*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (a*ArcTanh[Sin[c + d*x]])/(2*d) + ((I/3)*a*Sec[c + d*x]^3)/d + (a*Sec[c + d
*x]*Tan[c + d*x])/(2*d)
```

fricas [B] time = 0.59, size = 180, normalized size = 3.33

$$\frac{-6i\,ae^{(5i\,dx+5i\,c)}+16i\,ae^{(3i\,dx+3i\,c)}+6i\,ae^{(i\,dx+i\,c)}+3\left(ae^{(6i\,dx+6i\,c)}+3\,ae^{(4i\,dx+4i\,c)}+3\,ae^{(2i\,dx+2i\,c)}+a\right)\log\left(e^{(i\,dx+i\,c)}\right.}{6\left(de^{(6i\,dx+6i\,c)}+3\,de^{(4i\,dx+4i\,c)}+3\,de^{(2i\,dx+2i\,}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/6*(-6*I*a*e^(5*I*d*x + 5*I*c) + 16*I*a*e^(3*I*d*x + 3*I*c) + 6*I*a*e^(I*d
*x + I*c) + 3*(a*e^(6*I*d*x + 6*I*c) + 3*a*e^(4*I*d*x + 4*I*c) + 3*a*e^(2*I
*d*x + 2*I*c) + a)*log(e^(I*d*x + I*c) + I) - 3*(a*e^(6*I*d*x + 6*I*c) + 3*
a*e^(4*I*d*x + 4*I*c) + 3*a*e^(2*I*d*x + 2*I*c) + a)*log(e^(I*d*x + I*c) -
I))/(d*e^(6*I*d*x + 6*I*c) + 3*d*e^(4*I*d*x + 4*I*c) + 3*d*e^(2*I*d*x + 2*I
*c) + d)
```

giac [B] time = 1.42, size = 97, normalized size = 1.80

$$\frac{3\,a\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)-3\,a\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)+\frac{2\left(3\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{5}-6i\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{4}-3\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right.}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{2}-1\right)^{3}}}{6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/6*(3*a*log(tan(1/2*d*x + 1/2*c) + 1) - 3*a*log(tan(1/2*d*x + 1/2*c) - 1)
+ 2*(3*a*tan(1/2*d*x + 1/2*c)^5 - 6*I*a*tan(1/2*d*x + 1/2*c)^4 - 3*a*tan(1/
2*d*x + 1/2*c) - 2*I*a)/(tan(1/2*d*x + 1/2*c)^2 - 1)^3)/d
```

maple [A] time = 0.42, size = 55, normalized size = 1.02

$$\frac{ia}{3d\cos\left(dx+c\right)^{3}}+\frac{a\sec\left(dx+c\right)\tan\left(dx+c\right)}{2d}+\frac{a\ln\left(\sec\left(dx+c\right)+\tan\left(dx+c\right)\right)}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3*(a+I*a*tan(d*x+c)),x)
```

```
[Out] 1/3*I/d*a/cos(d*x+c)^3+1/2*a*sec(d*x+c)*tan(d*x+c)/d+1/2/d*a*ln(sec(d*x+c)+
tan(d*x+c))
```

maxima [A] time = 0.45, size = 61, normalized size = 1.13

$$-\frac{3\,a\left(\frac{2\,\sin\left(dx+c\right)}{\sin\left(dx+c\right)^{2}-1}-\log\left(\sin\left(dx+c\right)+1\right)+\log\left(\sin\left(dx+c\right)-1\right)\right)-\frac{4i\,a}{\cos\left(dx+c\right)^{3}}}{12\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/12*(3*a*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) - log(sin(d*x + c) + 1) + l
og(sin(d*x + c) - 1)) - 4*I*a/cos(d*x + c)^3)/d
```

mupad [B] time = 5.13, size = 107, normalized size = 1.98

$$\frac{a\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d}-\frac{-a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5+2\mathrm{i}\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+\frac{a\,2\mathrm{i}}{3}}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6-3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)/cos(c + d*x)^3,x)
```

```
[Out] (a*atanh(tan(c/2 + (d*x)/2)))/d - ((a*2i)/3 + a*tan(c/2 + (d*x)/2) + a*tan(
c/2 + (d*x)/2)^4*2i - a*tan(c/2 + (d*x)/2)^5)/(d*(3*tan(c/2 + (d*x)/2)^2 -
3*tan(c/2 + (d*x)/2)^4 + tan(c/2 + (d*x)/2)^6 - 1))
```

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

$$ia\left(\int\left(-i\sec^3\left(c+dx\right)\right)dx+\int\tan\left(c+dx\right)\sec^3\left(c+dx\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3*(a+I*a*tan(d*x+c)),x)
```

```
[Out] I*a*(Integral(-I*sec(c + d*x)**3, x) + Integral(tan(c + d*x)*sec(c + d*x)**
3, x))
```

3.14 $\int \sec(c+dx)(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=27

$$\frac{a\tanh^{-1}(\sin(c+dx))}{d}+\frac{ia\sec(c+dx)}{d}$$

```
[Out] a*arctanh(sin(d*x+c))/d+I*a*sec(d*x+c)/d
```

Rubi [A] time = 0.02, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {3486, 3770}

$$\frac{a\tanh^{-1}(\sin(c+dx))}{d}+\frac{ia\sec(c+dx)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]*(a + I*a*Tan[c + d*x]),x]
[Out] (a*ArcTanh[Sin[c + d*x]])/d + (I*a*Sec[c + d*x])/d
```

Rule 3486

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\int \sec(c+dx)(a+ia\tan(c+dx))\,dx &= \frac{ia\sec(c+dx)}{d}+a\int \sec(c+dx)\,dx\\ &= \frac{a\tanh^{-1}(\sin(c+dx))}{d}+\frac{ia\sec(c+dx)}{d}\end{aligned}$$

Mathematica [A] time = 0.01, size = 27, normalized size = 1.00

$$\frac{a\tanh^{-1}(\sin(c+dx))}{d}+\frac{ia\sec(c+dx)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]*(a + I*a*Tan[c + d*x]),x]
[Out] (a*ArcTanh[Sin[c + d*x]])/d + (I*a*Sec[c + d*x])/d
```

fricas [B] time = 0.51, size = 82, normalized size = 3.04

$$\frac{2i\,ae^{(i\,dx+i\,c)}+\left(ae^{(2i\,dx+2i\,c)}+a\right)\log\left(e^{(i\,dx+i\,c)}+i\right)-\left(ae^{(2i\,dx+2i\,c)}+a\right)\log\left(e^{(i\,dx+i\,c)}-i\right)}{de^{(2i\,dx+2i\,c)}+d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] (2*I*a*e^(I*d*x + I*c) + (a*e^(2*I*d*x + 2*I*c) + a)*log(e^(I*d*x + I*c) +
I) - (a*e^(2*I*d*x + 2*I*c) + a)*log(e^(I*d*x + I*c) - I))/(d*e^(2*I*d*x +
2*I*c) + d)
```

giac [B] time = 0.96, size = 52, normalized size = 1.93

$$\frac{a \log\left(\tan\left(\frac{1}{2} dx + \frac{1}{2} c\right) + 1\right) - a \log\left(\tan\left(\frac{1}{2} dx + \frac{1}{2} c\right) - 1\right) - \frac{2ia}{\tan\left(\frac{1}{2} dx + \frac{1}{2} c\right)^2 - 1}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

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

maple [A] time = 0.10, size = 36, normalized size = 1.33

$$\frac{ia}{d \cos(dx + c)} + \frac{a \ln(\sec(dx + c) + \tan(dx + c))}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)*(a+I*a*tan(d*x+c)),x)
```

```
[Out] I/d*a/cos(d*x+c)+1/d*a*ln(sec(d*x+c)+tan(d*x+c))
```

maxima [A] time = 0.35, size = 32, normalized size = 1.19

$$\frac{a \log(\sec(dx + c) + \tan(dx + c)) + \frac{ia}{\cos(dx+c)}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] (a*log(sec(d*x + c) + tan(d*x + c)) + I*a/cos(d*x + c))/d
```

mupad [B] time = 3.35, size = 39, normalized size = 1.44

$$\frac{2\,a\,\mathrm{atanh}\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)\right)}{d} - \frac{a\,2\mathrm{i}}{d\,\left(\tan\left(\frac{c}{2} + \frac{d\,x}{2}\right)^2 - 1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)/cos(c + d*x),x)
```

```
[Out] (2*a*atanh(tan(c/2 + (d*x)/2)))/d - (a*2i)/(d*(tan(c/2 + (d*x)/2)^2 - 1))
```

sympy [A] time = 4.54, size = 41, normalized size = 1.52

$$\begin{cases} \frac{a \log(\tan(c+dx)+\sec(c+dx))+ia \sec(c+dx)}{d} & \text{for } d \neq 0 \\ x (ia \tan(c) + a) \sec(c) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c)),x)
```

```
[Out] Piecewise(((a*log(tan(c + d*x) + sec(c + d*x)) + I*a*sec(c + d*x))/d, Ne(d,
 0)), (x*(I*a*tan(c) + a)*sec(c), True))
```

3.15 $\int \cos(c+dx)(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=26

$$\frac{a\sin(c+dx)}{d}-\frac{ia\cos(c+dx)}{d}$$

```
[Out] -I*a*cos(d*x+c)/d+a*sin(d*x+c)/d
```

Rubi [A] time = 0.02, antiderivative size = 26, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {3486, 2637}

$$\frac{a\sin(c+dx)}{d}-\frac{ia\cos(c+dx)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((-I)*a*Cos[c + d*x])/d + (a*Sin[c + d*x])/d
```

Rule 2637

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rule 3486

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

Rubi steps

$$\begin{aligned}\int \cos(c+dx)(a+ia\tan(c+dx))\,dx &= -\frac{ia\cos(c+dx)}{d}+a\int \cos(c+dx)\,dx\\ &= -\frac{ia\cos(c+dx)}{d}+\frac{a\sin(c+dx)}{d}\end{aligned}$$

Mathematica [A] time = 0.02, size = 51, normalized size = 1.96

$$\frac{ia\sin(c)\sin(dx)}{d}-\frac{ia\cos(c)\cos(dx)}{d}+\frac{a\sin(c)\cos(dx)}{d}+\frac{a\cos(c)\sin(dx)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((-I)*a*Cos[c]*Cos[d*x])/d + (a*Cos[d*x]*Sin[c])/d + (a*Cos[c]*Sin[d*x])/d
+ (I*a*Sin[c]*Sin[d*x])/d
```

fricas [A] time = 0.71, size = 15, normalized size = 0.58

$$-\frac{i\,ae^{(i\,dx+i\,c)}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] -I*a*e^(I*d*x + I*c)/d
```

giac [B] time = 4.05, size = 84, normalized size = 3.23

$$-\frac{4i\,ae^{(i\,dx+i\,c)} + a\log\left(i\,e^{(i\,dx+i\,c)} + 1\right) + a\log\left(i\,e^{(i\,dx+i\,c)} - 1\right) - a\log\left(-i\,e^{(i\,dx+i\,c)} + 1\right) - a\log\left(-i\,e^{(i\,dx+i\,c)} - 1\right)}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

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

maple [A] time = 0.28, size = 24, normalized size = 0.92

$$\frac{-ia\cos\left(dx+c\right)+a\sin\left(dx+c\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)*(a+I*a*tan(d*x+c)),x)
```

```
[Out] 1/d*(-I*a*cos(d*x+c)+a*sin(d*x+c))
```

maxima [A] time = 0.38, size = 22, normalized size = 0.85

$$\frac{-i\,a\cos\left(dx+c\right)+a\sin\left(dx+c\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] (-I*a*cos(d*x + c) + a*sin(d*x + c))/d
```

mupad [B] time = 3.28, size = 20, normalized size = 0.77

$$\frac{2\,a}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+1{}\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)*(a + a*tan(c + d*x)*1i),x)
```

```
[Out] (2*a)/(d*(tan(c/2 + (d*x)/2) + 1i))
```

sympy [A] time = 0.14, size = 26, normalized size = 1.00

$$\begin{cases} -\frac{iae^{ic}e^{idx}}{d} & \text{for}\: d \neq 0 \\ axe^{ic} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c)),x)
```

```
[Out] Piecewise((-I*a*exp(I*c)*exp(I*d*x)/d, Ne(d, 0)), (a*x*exp(I*c), True))
```

3.16 $\int \cos^3(c+dx)(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=46

$$-\frac{a\sin^3(c+dx)}{3d}+\frac{a\sin(c+dx)}{d}-\frac{ia\cos^3(c+dx)}{3d}$$

```
[Out] -1/3*I*a*cos(d*x+c)^3/d+a*sin(d*x+c)/d-1/3*a*sin(d*x+c)^3/d
```

Rubi [A] time = 0.03, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {3486, 2633}

$$-\frac{a\sin^3(c+dx)}{3d}+\frac{a\sin(c+dx)}{d}-\frac{ia\cos^3(c+dx)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((-I/3)*a*Cos[c + d*x]^3)/d + (a*Sin[c + d*x])/d - (a*Sin[c + d*x]^3)/(3*d)
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3486

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

Rubi steps

$$\begin{aligned}\int \cos^3(c+dx)(a+ia\tan(c+dx))\,dx &= -\frac{ia\cos^3(c+dx)}{3d}+a\int \cos^3(c+dx)\,dx\\ &= -\frac{ia\cos^3(c+dx)}{3d}-\frac{a\,\text{Subst}\left(\int \left(1-x^2\right)\,dx,x,-\sin(c+dx)\right)}{d}\\ &= -\frac{ia\cos^3(c+dx)}{3d}+\frac{a\sin(c+dx)}{d}-\frac{a\sin^3(c+dx)}{3d}\end{aligned}$$

Mathematica [A] time = 0.01, size = 46, normalized size = 1.00

$$-\frac{a\sin^3(c+dx)}{3d}+\frac{a\sin(c+dx)}{d}-\frac{ia\cos^3(c+dx)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((-1/3*I)*a*Cos[c + d*x]^3)/d + (a*Sin[c + d*x])/d - (a*Sin[c + d*x]^3)/(3*
d)
```

fricas [A] time = 0.41, size = 42, normalized size = 0.91

$$\frac{\left(-i\,ae^{(4i\,dx+4i\,c)}-6i\,ae^{(2i\,dx+2i\,c)}+3i\,a\right)e^{(-i\,dx-i\,c)}}{12\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/12*(-I*a*e^(4*I*d*x + 4*I*c) - 6*I*a*e^(2*I*d*x + 2*I*c) + 3*I*a)*e^(-I*d
*x - I*c)/d
```

giac [B] time = 1.18, size = 196, normalized size = 4.26

$$-\frac{\left(9\,ae^{(i\,dx+i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}+1\right)+6\,ae^{(i\,dx+i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}-1\right)-9\,ae^{(i\,dx+i\,c)}\log\left(-i\,e^{(i\,dx+i\,c)}+1\right)-6\,ae^{(i\,dx+i\,c)}\,\mathrm{lo}\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/48*(9*a*e^(I*d*x + I*c)*log(I*e^(I*d*x + I*c) + 1) + 6*a*e^(I*d*x + I*c)
*log(I*e^(I*d*x + I*c) - 1) - 9*a*e^(I*d*x + I*c)*log(-I*e^(I*d*x + I*c) +
1) - 6*a*e^(I*d*x + I*c)*log(-I*e^(I*d*x + I*c) - 1) - 3*a*e^(I*d*x + I*c)*
log(I*e^(I*d*x) + e^(-I*c)) + 3*a*e^(I*d*x + I*c)*log(-I*e^(I*d*x) + e^(-I*
c)) + 4*I*a*e^(4*I*d*x + 4*I*c) + 24*I*a*e^(2*I*d*x + 2*I*c) - 12*I*a)*e^(-
I*d*x - I*c)/d
```

maple [A] time = 0.41, size = 37, normalized size = 0.80

$$\frac{-\frac{ia\left(\cos^{3}(dx+c)\right)}{3}+\frac{a\left(2+\cos^{2}(dx+c)\right)\sin(dx+c)}{3}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3*(a+I*a*tan(d*x+c)),x)
```

```
[Out] 1/d*(-1/3*I*a*cos(d*x+c)^3+1/3*a*(2+cos(d*x+c)^2)*sin(d*x+c))
```

maxima [A] time = 0.32, size = 36, normalized size = 0.78

$$-\frac{i\,a\cos\left(dx+c\right)^{3}+\left(\sin\left(dx+c\right)^{3}-3\,\sin\left(dx+c\right)\right)a}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/3*(I*a*cos(d*x + c)^3 + (sin(d*x + c)^3 - 3*sin(d*x + c))*a)/d
```

mupad [B] time = 3.41, size = 54, normalized size = 1.17

$$\frac{2\,a\left(-\frac{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{2}\,3\mathrm{i}}{4}-\frac{\cos\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)^{2}\,1\mathrm{i}}{4}+\frac{9\,\sin(c+d\,x)}{8}+\frac{\sin(3\,c+3\,d\,x)}{8}\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i),x)
```

```
[Out] (2*a*((9*sin(c + d*x))/8 + sin(3*c + 3*d*x)/8 - (cos(c/2 + (d*x)/2)^2*3i)/4
 - (cos((3*c)/2 + (3*d*x)/2)^2*1i)/4))/(3*d)
```

sympy [A] time = 0.30, size = 109, normalized size = 2.37

$$\begin{cases} -\frac{\left(8iad^{2}e^{4ic}e^{3idx}+48iad^{2}e^{2ic}e^{idx}-24iad^{2}e^{-idx}\right)e^{-ic}}{96d^{3}} & \text{for } 96d^{3}e^{ic}\neq 0 \\ \frac{x\left(ae^{4ic}+2ae^{2ic}+a\right)e^{-ic}}{4} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3*(a+I*a*tan(d*x+c)),x)
```

```
[Out] Piecewise((-(8*I*a*d**2*exp(4*I*c)*exp(3*I*d*x) + 48*I*a*d**2*exp(2*I*c)*ex
p(I*d*x) - 24*I*a*d**2*exp(-I*d*x))*exp(-I*c)/(96*d**3), Ne(96*d**3*exp(I*c
), 0)), (x*(a*exp(4*I*c) + 2*a*exp(2*I*c) + a)*exp(-I*c)/4, True))
```

3.17 $\int \cos^5(c+dx)(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=62

$$\frac{a\sin^5(c+dx)}{5d}-\frac{2a\sin^3(c+dx)}{3d}+\frac{a\sin(c+dx)}{d}-\frac{ia\cos^5(c+dx)}{5d}$$

```
[Out] -1/5*I*a*cos(d*x+c)^5/d+a*sin(d*x+c)/d-2/3*a*sin(d*x+c)^3/d+1/5*a*sin(d*x+c
)^5/d
```

Rubi [A] time = 0.03, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {3486, 2633}

$$\frac{a\sin^5(c+dx)}{5d}-\frac{2a\sin^3(c+dx)}{3d}+\frac{a\sin(c+dx)}{d}-\frac{ia\cos^5(c+dx)}{5d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^5*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((-I/5)*a*Cos[c + d*x]^5)/d + (a*Sin[c + d*x])/d - (2*a*Sin[c + d*x]^3)/(3*
d) + (a*Sin[c + d*x]^5)/(5*d)
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3486

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

Rubi steps

$$\begin{aligned}\int \cos^5(c+dx)(a+ia\tan(c+dx))\,dx &= -\frac{ia\cos^5(c+dx)}{5d}+a\int \cos^5(c+dx)\,dx\\ &= -\frac{ia\cos^5(c+dx)}{5d}-\frac{a\operatorname{Subst}\left(\int \left(1-2x^2+x^4\right)\,dx,x,-\sin(c+dx)\right)}{d}\\ &= -\frac{ia\cos^5(c+dx)}{5d}+\frac{a\sin(c+dx)}{d}-\frac{2a\sin^3(c+dx)}{3d}+\frac{a\sin^5(c+dx)}{5d}\end{aligned}$$

Mathematica [A] time = 0.02, size = 62, normalized size = 1.00

$$\frac{a\sin^5(c+dx)}{5d}-\frac{2a\sin^3(c+dx)}{3d}+\frac{a\sin(c+dx)}{d}-\frac{ia\cos^5(c+dx)}{5d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^5*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((-1/5*I)*a*Cos[c + d*x]^5)/d + (a*Sin[c + d*x])/d - (2*a*Sin[c + d*x]^3)/(
3*d) + (a*Sin[c + d*x]^5)/(5*d)
```

fricas [A] time = 0.47, size = 66, normalized size = 1.06

$$\frac{\left(-3i\,ae^{(8i\,dx+8i\,c)} - 20i\,ae^{(6i\,dx+6i\,c)} - 90i\,ae^{(4i\,dx+4i\,c)} + 60i\,ae^{(2i\,dx+2i\,c)} + 5i\,a\right)e^{(-3i\,dx-3i\,c)}}{240\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/240*(-3*I*a*e^(8*I*d*x + 8*I*c) - 20*I*a*e^(6*I*d*x + 6*I*c) - 90*I*a*e^(
4*I*d*x + 4*I*c) + 60*I*a*e^(2*I*d*x + 2*I*c) + 5*I*a)*e^(-3*I*d*x - 3*I*c)
/d
```

giac [B] time = 1.04, size = 220, normalized size = 3.55

$$-\frac{\left(135\,ae^{(3i\,dx+i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}+1\right) + 90\,ae^{(3i\,dx+i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}-1\right) - 135\,ae^{(3i\,dx+i\,c)}\log\left(-i\,e^{(i\,dx+i\,c)}+1\right) - 9}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/960*(135*a*e^(3*I*d*x + I*c)*log(I*e^(I*d*x + I*c) + 1) + 90*a*e^(3*I*d*
x + I*c)*log(I*e^(I*d*x + I*c) - 1) - 135*a*e^(3*I*d*x + I*c)*log(-I*e^(I*d
*x + I*c) + 1) - 90*a*e^(3*I*d*x + I*c)*log(-I*e^(I*d*x + I*c) - 1) - 45*a*
e^(3*I*d*x + I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 45*a*e^(3*I*d*x + I*c)*log(
-I*e^(I*d*x) + e^(-I*c)) + 12*I*a*e^(8*I*d*x + 6*I*c) + 80*I*a*e^(6*I*d*x +
 4*I*c) + 360*I*a*e^(4*I*d*x + 2*I*c) - 240*I*a*e^(2*I*d*x) - 20*I*a*e^(-2*
I*c))*e^(-3*I*d*x - I*c)/d
```

maple [A] time = 0.42, size = 47, normalized size = 0.76

$$\frac{-\frac{ia\left(\cos^{5}(dx+c)\right)}{5} + \frac{a\left(\frac{8}{3}+\cos^{4}(dx+c)+\frac{4\left(\cos^{2}(dx+c)\right)}{3}\right)\sin(dx+c)}{5}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^5*(a+I*a*tan(d*x+c)),x)
```

```
[Out] 1/d*(-1/5*I*a*cos(d*x+c)^5+1/5*a*(8/3+cos(d*x+c)^4+4/3*cos(d*x+c)^2)*sin(d*
x+c))
```

maxima [A] time = 0.33, size = 49, normalized size = 0.79

$$-\frac{3i\,a\cos\left(dx+c\right)^{5} - \left(3\,\sin\left(dx+c\right)^{5} - 10\,\sin\left(dx+c\right)^{3} + 15\,\sin\left(dx+c\right)\right)a}{15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/15*(3*I*a*cos(d*x + c)^5 - (3*sin(d*x + c)^5 - 10*sin(d*x + c)^3 + 15*si
n(d*x + c))*a)/d
```

mupad [B] time = 4.93, size = 70, normalized size = 1.13

$$-\frac{2\,a\,\left(-\frac{75\,\sin(c+d\,x)}{16} - \frac{25\,\sin(3\,c+3\,d\,x)}{32} - \frac{3\,\sin(5\,c+5\,d\,x)}{32} + \frac{\cos(c+d\,x)\,15\mathrm{i}}{16} + \frac{\cos(3\,c+3\,d\,x)\,15\mathrm{i}}{32} + \frac{\cos(5\,c+5\,d\,x)\,3\mathrm{i}}{32}\right)}{15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i),x)
```

```
[Out] -(2*a*((cos(c + d*x)*15i)/16 - (75*sin(c + d*x))/16 + (cos(3*c + 3*d*x)*15i
)/32 + (cos(5*c + 5*d*x)*3i)/32 - (25*sin(3*c + 3*d*x))/32 - (3*sin(5*c + 5
*d*x))/32))/(15*d)
```

sympy [A] time = 0.44, size = 187, normalized size = 3.02

$$\begin{cases} -\frac{\left(18432iad^4e^{9ic}e^{5idx}+122880iad^4e^{7ic}e^{3idx}+552960iad^4e^{5ic}e^{idx}-368640iad^4e^{3ic}e^{-idx}-30720iad^4e^{ic}e^{-3idx}\right)e^{-4ic}}{1474560d^5} & \text{for } 1474560d^5e^{4ic} \neq 0 \\ \frac{x\left(ae^{8ic}+4ae^{6ic}+6ae^{4ic}+4ae^{2ic}+a\right)e^{-3ic}}{16} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**5*(a+I*a*tan(d*x+c)),x)
```

```
[Out] Piecewise((-(18432*I*a*d**4*exp(9*I*c)*exp(5*I*d*x) + 122880*I*a*d**4*exp(7
*I*c)*exp(3*I*d*x) + 552960*I*a*d**4*exp(5*I*c)*exp(I*d*x) - 368640*I*a*d**
4*exp(3*I*c)*exp(-I*d*x) - 30720*I*a*d**4*exp(I*c)*exp(-3*I*d*x))*exp(-4*I*
c)/(1474560*d**5), Ne(1474560*d**5*exp(4*I*c), 0)), (x*(a*exp(8*I*c) + 4*a*
exp(6*I*c) + 6*a*exp(4*I*c) + 4*a*exp(2*I*c) + a)*exp(-3*I*c)/16, True))
```

3.18 $\int \cos^7(c+dx)(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=76

$$-\frac{a\sin^7(c+dx)}{7d}+\frac{3a\sin^5(c+dx)}{5d}-\frac{a\sin^3(c+dx)}{d}+\frac{a\sin(c+dx)}{d}-\frac{ia\cos^7(c+dx)}{7d}$$

```
[Out] -1/7*I*a*cos(d*x+c)^7/d+a*sin(d*x+c)/d-a*sin(d*x+c)^3/d+3/5*a*sin(d*x+c)^5/
d-1/7*a*sin(d*x+c)^7/d
```

Rubi [A] time = 0.04, antiderivative size = 76, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {3486, 2633}

$$-\frac{a\sin^7(c+dx)}{7d}+\frac{3a\sin^5(c+dx)}{5d}-\frac{a\sin^3(c+dx)}{d}+\frac{a\sin(c+dx)}{d}-\frac{ia\cos^7(c+dx)}{7d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^7*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((-I/7)*a*Cos[c + d*x]^7)/d + (a*Sin[c + d*x])/d - (a*Sin[c + d*x]^3)/d + (
3*a*Sin[c + d*x]^5)/(5*d) - (a*Sin[c + d*x]^7)/(7*d)
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3486

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

Rubi steps

$$\begin{aligned}\int \cos^7(c+dx)(a+ia\tan(c+dx))\,dx &= -\frac{ia\cos^7(c+dx)}{7d}+a\int \cos^7(c+dx)\,dx\\ &= -\frac{ia\cos^7(c+dx)}{7d}-\frac{a\,\text{Subst}\left(\int \left(1-3x^2+3x^4-x^6\right)dx,x,-\sin(c+d\right.}{d}\\ &= -\frac{ia\cos^7(c+dx)}{7d}+\frac{a\sin(c+dx)}{d}-\frac{a\sin^3(c+dx)}{d}+\frac{3a\sin^5(c+dx)}{5d}\end{aligned}$$

Mathematica [A] time = 0.05, size = 76, normalized size = 1.00

$$-\frac{a\sin^7(c+dx)}{7d}+\frac{3a\sin^5(c+dx)}{5d}-\frac{a\sin^3(c+dx)}{d}+\frac{a\sin(c+dx)}{d}-\frac{ia\cos^7(c+dx)}{7d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^7*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((-1/7*I)*a*Cos[c + d*x]^7)/d + (a*Sin[c + d*x])/d - (a*Sin[c + d*x]^3)/d +
 (3*a*Sin[c + d*x]^5)/(5*d) - (a*Sin[c + d*x]^7)/(7*d)
```

fricas [A] time = 0.60, size = 90, normalized size = 1.18

$$\frac{\left(-5i\,ae^{(12i\,dx+12i\,c)} - 42i\,ae^{(10i\,dx+10i\,c)} - 175i\,ae^{(8i\,dx+8i\,c)} - 700i\,ae^{(6i\,dx+6i\,c)} + 525i\,ae^{(4i\,dx+4i\,c)} + 70i\,ae^{(2i\,dx+2i\,c)} + 7i}{2240\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/2240*(-5*I*a*e^(12*I*d*x + 12*I*c) - 42*I*a*e^(10*I*d*x + 10*I*c) - 175*I
*a*e^(8*I*d*x + 8*I*c) - 700*I*a*e^(6*I*d*x + 6*I*c) + 525*I*a*e^(4*I*d*x +
 4*I*c) + 70*I*a*e^(2*I*d*x + 2*I*c) + 7*I*a)*e^(-5*I*d*x - 5*I*c)/d
```

giac [B] time = 1.25, size = 244, normalized size = 3.21

$$-\frac{\left(1015\,ae^{(5i\,dx+i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}+1\right) + 700\,ae^{(5i\,dx+i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}-1\right) - 1015\,ae^{(5i\,dx+i\,c)}\log\left(-i\,e^{(i\,dx+i\,c)}+1\right) -}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/8960*(1015*a*e^(5*I*d*x + I*c)*log(I*e^(I*d*x + I*c) + 1) + 700*a*e^(5*I
*d*x + I*c)*log(I*e^(I*d*x + I*c) - 1) - 1015*a*e^(5*I*d*x + I*c)*log(-I*e^
(I*d*x + I*c) + 1) - 700*a*e^(5*I*d*x + I*c)*log(-I*e^(I*d*x + I*c) - 1) -
315*a*e^(5*I*d*x + I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 315*a*e^(5*I*d*x + I*
c)*log(-I*e^(I*d*x) + e^(-I*c)) + 20*I*a*e^(12*I*d*x + 8*I*c) + 168*I*a*e^(
10*I*d*x + 6*I*c) + 700*I*a*e^(8*I*d*x + 4*I*c) + 2800*I*a*e^(6*I*d*x + 2*I
*c) - 280*I*a*e^(2*I*d*x - 2*I*c) - 2100*I*a*e^(4*I*d*x) - 28*I*a*e^(-4*I*c
))*e^(-5*I*d*x - I*c)/d
```

maple [A] time = 0.42, size = 57, normalized size = 0.75

$$\frac{-\frac{ia\left(\cos^{7}(dx+c)\right)}{7} + \frac{a\left(\frac{16}{5}+\cos^{6}(dx+c)+\frac{6\left(\cos^{4}(dx+c)\right)}{5}+\frac{8\left(\cos^{2}(dx+c)\right)}{5}\right)\sin(dx+c)}{7}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^7*(a+I*a*tan(d*x+c)),x)
```

```
[Out] 1/d*(-1/7*I*a*cos(d*x+c)^7+1/7*a*(16/5+cos(d*x+c)^6+6/5*cos(d*x+c)^4+8/5*co
s(d*x+c)^2)*sin(d*x+c))
```

maxima [A] time = 0.46, size = 58, normalized size = 0.76

$$-\frac{5i\,a\cos\left(dx+c\right)^{7} + \left(5\,\sin\left(dx+c\right)^{7} - 21\,\sin\left(dx+c\right)^{5} + 35\,\sin\left(dx+c\right)^{3} - 35\,\sin\left(dx+c\right)\right)a}{35\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/35*(5*I*a*cos(d*x + c)^7 + (5*sin(d*x + c)^7 - 21*sin(d*x + c)^5 + 35*si
n(d*x + c)^3 - 35*sin(d*x + c))*a)/d
```

mupad [B] time = 6.07, size = 93, normalized size = 1.22

$$-\frac{2\,a\left(-\frac{1225\,\sin(c+d\,x)}{128} - \frac{245\,\sin(3\,c+3\,d\,x)}{128} - \frac{49\,\sin(5\,c+5\,d\,x)}{128} - \frac{5\,\sin(7\,c+7\,d\,x)}{128} + \frac{\cos(c+d\,x)\,175\mathrm{i}}{128} + \frac{\cos(3\,c+3\,d\,x)\,105\mathrm{i}}{128} + \frac{\cos(5\,c+5\,d\,x)}{128}\right.}{35\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^7*(a + a*tan(c + d*x)*1i),x)
```

```
[Out] -(2*a*((cos(c + d*x)*175i)/128 - (1225*sin(c + d*x))/128 + (cos(3*c + 3*d*x
)*105i)/128 + (cos(5*c + 5*d*x)*35i)/128 + (cos(7*c + 7*d*x)*5i)/128 - (245
*sin(3*c + 3*d*x))/128 - (49*sin(5*c + 5*d*x))/128 - (5*sin(7*c + 7*d*x))/1
28))/(35*d)
```

sympy [A] time = 0.61, size = 257, normalized size = 3.38

$$\begin{cases} -\frac{\left(107374182400iad^6e^{16ic}e^{7idx}+901943132160iad^6e^{14ic}e^{5idx}+3758096384000iad^6e^{12ic}e^{3idx}+15032385536000iad^6e^{10ic}e^{idx}-11274289152000iad^6 \ldots}{48103633715200d^7} \\ \frac{x\left(ae^{12ic}+6ae^{10ic}+15ae^{8ic}+20ae^{6ic}+15ae^{4ic}+6ae^{2ic}+a\right)e^{-5ic}}{64} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**7*(a+I*a*tan(d*x+c)),x)
```

```
[Out] Piecewise((-(107374182400*I*a*d**6*exp(16*I*c)*exp(7*I*d*x) + 901943132160*
I*a*d**6*exp(14*I*c)*exp(5*I*d*x) + 3758096384000*I*a*d**6*exp(12*I*c)*exp(
3*I*d*x) + 15032385536000*I*a*d**6*exp(10*I*c)*exp(I*d*x) - 11274289152000*
I*a*d**6*exp(8*I*c)*exp(-I*d*x) - 1503238553600*I*a*d**6*exp(6*I*c)*exp(-3*
I*d*x) - 150323855360*I*a*d**6*exp(4*I*c)*exp(-5*I*d*x))*exp(-9*I*c)/(48103
633715200*d**7), Ne(48103633715200*d**7*exp(9*I*c), 0)), (x*(a*exp(12*I*c)
+ 6*a*exp(10*I*c) + 15*a*exp(8*I*c) + 20*a*exp(6*I*c) + 15*a*exp(4*I*c) + 6
*a*exp(2*I*c) + a)*exp(-5*I*c)/64, True))
```

3.19 $\int \sec^8(c+dx)(a+ia\tan(c+dx))^2\,dx$

Optimal. Leaf size=109

$$\frac{i(a+ia\tan(c+dx))^9}{9a^7d}-\frac{3i(a+ia\tan(c+dx))^8}{4a^6d}+\frac{12i(a+ia\tan(c+dx))^7}{7a^5d}-\frac{4i(a+ia\tan(c+dx))^6}{3a^4d}$$

```
[Out] -4/3*I*(a+I*a*tan(d*x+c))^6/a^4/d+12/7*I*(a+I*a*tan(d*x+c))^7/a^5/d-3/4*I*(
a+I*a*tan(d*x+c))^8/a^6/d+1/9*I*(a+I*a*tan(d*x+c))^9/a^7/d
```

Rubi [A] time = 0.07, antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {3487, 43}

$$\frac{i(a+ia\tan(c+dx))^9}{9a^7d}-\frac{3i(a+ia\tan(c+dx))^8}{4a^6d}+\frac{12i(a+ia\tan(c+dx))^7}{7a^5d}-\frac{4i(a+ia\tan(c+dx))^6}{3a^4d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^8*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (((-4*I)/3)*(a + I*a*Tan[c + d*x])^6)/(a^4*d) + (((12*I)/7)*(a + I*a*Tan[c
+ d*x])^7)/(a^5*d) - (((3*I)/4)*(a + I*a*Tan[c + d*x])^8)/(a^6*d) + ((I/9)*
(a + I*a*Tan[c + d*x])^9)/(a^7*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^8(c+dx)(a+ia\tan(c+dx))^2\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^3(a+x)^5\,dx, x, ia\tan(c+dx)\right)}{a^7d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(8a^3(a+x)^5-12a^2(a+x)^6+6a(a+x)^7-(a+x)^8\right)dx, x,\right.}{a^7d}\\ &= -\frac{4i(a+ia\tan(c+dx))^6}{3a^4d}+\frac{12i(a+ia\tan(c+dx))^7}{7a^5d}-\frac{3i(a+ia\tan(c+\right.}{4a^6d}\end{aligned}$$

Mathematica [A] time = 1.43, size = 99, normalized size = 0.91

$$\frac{a^2\sec(c)\sec^9(c+dx)(-63\sin(2c+dx)+84\sin(2c+3dx)+36\sin(4c+5dx)+9\sin(6c+7dx)+\sin(8c+9dx)}{504d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^8*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (a^2*Sec[c]*Sec[c + d*x]^9*((63*I)*Cos[d*x] + (63*I)*Cos[2*c + d*x] + 63*Si
n[d*x] - 63*Sin[2*c + d*x] + 84*Sin[2*c + 3*d*x] + 36*Sin[4*c + 5*d*x] + 9*
Sin[6*c + 7*d*x] + Sin[8*c + 9*d*x]))/(504*d)
```

fricas [B] time = 0.49, size = 189, normalized size = 1.73

$$\frac{8064i\,a^2e^{(10i\,dx+10i\,c)} + 8064i\,a^2e^{(8i\,dx+8i\,c)} + 5376i\,a^2e^{(6i\,dx+6i\,c)} + 2304i\,a^2e^{(4i\,dx+4i\,c)} + \cdots}{63\left(de^{(18i\,dx+18i\,c)} + 9\,de^{(16i\,dx+16i\,c)} + 36\,de^{(14i\,dx+14i\,c)} + 84\,de^{(12i\,dx+12i\,c)} + 126\,de^{(10i\,dx+10i\,c)} + 126\,de^{(8i\,dx+8i\,c)} + \cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/63*(8064*I*a^2*e^(10*I*d*x + 10*I*c) + 8064*I*a^2*e^(8*I*d*x + 8*I*c) + 5
376*I*a^2*e^(6*I*d*x + 6*I*c) + 2304*I*a^2*e^(4*I*d*x + 4*I*c) + 576*I*a^2*
e^(2*I*d*x + 2*I*c) + 64*I*a^2)/(d*e^(18*I*d*x + 18*I*c) + 9*d*e^(16*I*d*x
+ 16*I*c) + 36*d*e^(14*I*d*x + 14*I*c) + 84*d*e^(12*I*d*x + 12*I*c) + 126*d
*e^(10*I*d*x + 10*I*c) + 126*d*e^(8*I*d*x + 8*I*c) + 84*d*e^(6*I*d*x + 6*I*
c) + 36*d*e^(4*I*d*x + 4*I*c) + 9*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [A] time = 1.00, size = 108, normalized size = 0.99

$$-\frac{28\,a^2\tan\left(dx+c\right)^9 - 63i\,a^2\tan\left(dx+c\right)^8 + 72\,a^2\tan\left(dx+c\right)^7 - 252i\,a^2\tan\left(dx+c\right)^6 - 378i\,a^2\tan\left(dx+c\right)^4 \cdots}{252\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -1/252*(28*a^2*tan(d*x + c)^9 - 63*I*a^2*tan(d*x + c)^8 + 72*a^2*tan(d*x +
c)^7 - 252*I*a^2*tan(d*x + c)^6 - 378*I*a^2*tan(d*x + c)^4 - 168*a^2*tan(d*
x + c)^3 - 252*I*a^2*tan(d*x + c)^2 - 252*a^2*tan(d*x + c))/d
```

maple [A] time = 0.44, size = 141, normalized size = 1.29

$$\frac{-a^2\left(\frac{\sin^3(dx+c)}{9\cos(dx+c)^9} + \frac{2\left(\sin^3(dx+c)\right)}{21\cos(dx+c)^7} + \frac{8\left(\sin^3(dx+c)\right)}{105\cos(dx+c)^5} + \frac{16\left(\sin^3(dx+c)\right)}{315\cos(dx+c)^3}\right) + \frac{ia^2}{4\cos(dx+c)^8} - a^2\left(-\frac{16}{35} - \frac{\left(\sec^6(dx+c)\right)}{7} - \frac{6\left(\sec^4(dx+c)\right)}{35} \cdots\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(-a^2*(1/9*sin(d*x+c)^3/cos(d*x+c)^9+2/21*sin(d*x+c)^3/cos(d*x+c)^7+8/1
05*sin(d*x+c)^3/cos(d*x+c)^5+16/315*sin(d*x+c)^3/cos(d*x+c)^3)+1/4*I*a^2/co
s(d*x+c)^8-a^2*(-16/35-1/7*sec(d*x+c)^6-6/35*sec(d*x+c)^4-8/35*sec(d*x+c)^2
)*tan(d*x+c))
```

maxima [A] time = 0.56, size = 108, normalized size = 0.99

$$-\frac{140\,a^2\tan\left(dx+c\right)^9 - 315i\,a^2\tan\left(dx+c\right)^8 + 360\,a^2\tan\left(dx+c\right)^7 - 1260i\,a^2\tan\left(dx+c\right)^6 - 1890i\,a^2\tan\left(dx \cdots\right.}{1260\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/1260*(140*a^2*tan(d*x + c)^9 - 315*I*a^2*tan(d*x + c)^8 + 360*a^2*tan(d*
x + c)^7 - 1260*I*a^2*tan(d*x + c)^6 - 1890*I*a^2*tan(d*x + c)^4 - 840*a^2*
tan(d*x + c)^3 - 1260*I*a^2*tan(d*x + c)^2 - 1260*a^2*tan(d*x + c))/d
```

mupad [B] time = 3.26, size = 151, normalized size = 1.39

$$\frac{a^2 \sin(c+d\,x)\,\left(252\cos(c+d\,x)^8+\cos(c+d\,x)^7\,\sin(c+d\,x)\,252\mathrm{i}+168\cos(c+d\,x)^6\sin(c+d\,x)^2+\cos(c+\cdots\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^2/cos(c + d*x)^8,x)
```

```
[Out] (a^2*sin(c + d*x)*(cos(c + d*x)*sin(c + d*x)^7*63i + cos(c + d*x)^7*sin(c +
 d*x)*252i + 252*cos(c + d*x)^8 - 28*sin(c + d*x)^8 - 72*cos(c + d*x)^2*sin
(c + d*x)^6 + cos(c + d*x)^3*sin(c + d*x)^5*252i + cos(c + d*x)^5*sin(c + d
*x)^3*378i + 168*cos(c + d*x)^6*sin(c + d*x)^2))/(252*d*cos(c + d*x)^9)
```

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

$$-a^2\left(\int\tan^2(c+dx)\sec^8(c+dx)\,dx+\int\left(-2i\tan(c+dx)\sec^8(c+dx)\right)dx+\int\left(-\sec^8(c+dx)\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8*(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -a**2*(Integral(tan(c + d*x)**2*sec(c + d*x)**8, x) + Integral(-2*I*tan(c +
 d*x)*sec(c + d*x)**8, x) + Integral(-sec(c + d*x)**8, x))
```

3.20 $\int \sec^6(c+dx)(a+ia\tan(c+dx))^2\,dx$

Optimal. Leaf size=82

$$-\frac{i(a+ia\tan(c+dx))^7}{7a^5d}+\frac{2i(a+ia\tan(c+dx))^6}{3a^4d}-\frac{4i(a+ia\tan(c+dx))^5}{5a^3d}$$

```
[Out] -4/5*I*(a+I*a*tan(d*x+c))^5/a^3/d+2/3*I*(a+I*a*tan(d*x+c))^6/a^4/d-1/7*I*(a
+I*a*tan(d*x+c))^7/a^5/d
```

Rubi [A] time = 0.06, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = $\{3487, 43\}$

$$-\frac{i(a+ia\tan(c+dx))^7}{7a^5d}+\frac{2i(a+ia\tan(c+dx))^6}{3a^4d}-\frac{4i(a+ia\tan(c+dx))^5}{5a^3d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (((-4*I)/5)*(a + I*a*Tan[c + d*x])^5)/(a^3*d) + (((2*I)/3)*(a + I*a*Tan[c +
 d*x])^6)/(a^4*d) - ((I/7)*(a + I*a*Tan[c + d*x])^7)/(a^5*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^6(c+dx)(a+ia\tan(c+dx))^2\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^2(a+x)^4\,dx, x, ia\tan(c+dx)\right)}{a^5d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(4a^2(a+x)^4-4a(a+x)^5+(a+x)^6\right)dx, x, ia\tan(c+d\right.}{a^5d}\\ &= -\frac{4i(a+ia\tan(c+dx))^5}{5a^3d}+\frac{2i(a+ia\tan(c+dx))^6}{3a^4d}-\frac{i(a+ia\tan(c+}{7a^5d}\end{aligned}$$

Mathematica [A] time = 1.21, size = 90, normalized size = 1.10

$$\frac{a^2\sec(c)\sec^7(c+dx)(-35\sin(2c+dx)+42\sin(2c+3dx)+14\sin(4c+5dx)+2\sin(6c+7dx)+35i\cos(2c}{210d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (a^2*Sec[c]*Sec[c + d*x]^7*((35*I)*Cos[d*x] + (35*I)*Cos[2*c + d*x] + 35*Si
n[d*x] - 35*Sin[2*c + d*x] + 42*Sin[2*c + 3*d*x] + 14*Sin[4*c + 5*d*x] + 2*
Sin[6*c + 7*d*x]))/(210*d)
```

fricas [B] time = 0.57, size = 151, normalized size = 1.84

$$\frac{4480i\,a^2e^{(8i\,dx+8i\,c)} + 4480i\,a^2e^{(6i\,dx+6i\,c)} + 2688i\,a^2e^{(4i\,dx+4i\,c)} + 896i\,a^2e^{(2i\,dx+2i\,c)} + 128i\,a^2}{105\left(de^{(14i\,dx+14i\,c)} + 7\,de^{(12i\,dx+12i\,c)} + 21\,de^{(10i\,dx+10i\,c)} + 35\,de^{(8i\,dx+8i\,c)} + 35\,de^{(6i\,dx+6i\,c)} + 21\,de^{(4i\,dx+4i\,c)} + 7\,de^{(2i\,dx}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/105*(4480*I*a^2*e^(8*I*d*x + 8*I*c) + 4480*I*a^2*e^(6*I*d*x + 6*I*c) + 26
88*I*a^2*e^(4*I*d*x + 4*I*c) + 896*I*a^2*e^(2*I*d*x + 2*I*c) + 128*I*a^2)/(
d*e^(14*I*d*x + 14*I*c) + 7*d*e^(12*I*d*x + 12*I*c) + 21*d*e^(10*I*d*x + 10
*I*c) + 35*d*e^(8*I*d*x + 8*I*c) + 35*d*e^(6*I*d*x + 6*I*c) + 21*d*e^(4*I*d
*x + 4*I*c) + 7*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [A] time = 1.45, size = 95, normalized size = 1.16

$$-\frac{15\,a^2\tan\left(dx+c\right)^7 - 35i\,a^2\tan\left(dx+c\right)^6 + 21\,a^2\tan\left(dx+c\right)^5 - 105i\,a^2\tan\left(dx+c\right)^4 - 35\,a^2\tan\left(dx+c\right)^3 - 105}{105\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -1/105*(15*a^2*tan(d*x + c)^7 - 35*I*a^2*tan(d*x + c)^6 + 21*a^2*tan(d*x +
c)^5 - 105*I*a^2*tan(d*x + c)^4 - 35*a^2*tan(d*x + c)^3 - 105*I*a^2*tan(d*x
 + c)^2 - 105*a^2*tan(d*x + c))/d
```

maple [A] time = 0.44, size = 113, normalized size = 1.38

$$\frac{-a^2\left(\frac{\sin^3(dx+c)}{7\cos(dx+c)^7} + \frac{4\left(\sin^3(dx+c)\right)}{35\cos(dx+c)^5} + \frac{8\left(\sin^3(dx+c)\right)}{105\cos(dx+c)^3}\right) + \frac{ia^2}{3\cos(dx+c)^6} - a^2\left(-\frac{8}{15} - \frac{\left(\sec^4(dx+c)\right)}{5} - \frac{4\left(\sec^2(dx+c)\right)}{15}\right)\tan\left(dx+c\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(-a^2*(1/7*sin(d*x+c)^3/cos(d*x+c)^7+4/35*sin(d*x+c)^3/cos(d*x+c)^5+8/1
05*sin(d*x+c)^3/cos(d*x+c)^3)+1/3*I*a^2/cos(d*x+c)^6-a^2*(-8/15-1/5*sec(d*x
+c)^4-4/15*sec(d*x+c)^2)*tan(d*x+c))
```

maxima [A] time = 0.45, size = 95, normalized size = 1.16

$$-\frac{15\,a^2\tan\left(dx+c\right)^7 - 35i\,a^2\tan\left(dx+c\right)^6 + 21\,a^2\tan\left(dx+c\right)^5 - 105i\,a^2\tan\left(dx+c\right)^4 - 35\,a^2\tan\left(dx+c\right)^3 - 105}{105\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/105*(15*a^2*tan(d*x + c)^7 - 35*I*a^2*tan(d*x + c)^6 + 21*a^2*tan(d*x +
c)^5 - 105*I*a^2*tan(d*x + c)^4 - 35*a^2*tan(d*x + c)^3 - 105*I*a^2*tan(d*x
 + c)^2 - 105*a^2*tan(d*x + c))/d
```

mupad [B] time = 3.24, size = 132, normalized size = 1.61

$$\frac{a^2\sin\left(c+d\,x\right)\,\left(105\cos\left(c+d\,x\right)^6 + \cos\left(c+d\,x\right)^5\sin\left(c+d\,x\right)\,105\mathrm{i} + 35\cos\left(c+d\,x\right)^4\sin\left(c+d\,x\right)^2 + \cos\left(c+\right.\right.}{105\,d\cos\left(c\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^2/cos(c + d*x)^6,x)
```

```
[Out] (a^2*sin(c + d*x)*(cos(c + d*x)*sin(c + d*x)^5*35i + cos(c + d*x)^5*sin(c +
 d*x)*105i + 105*cos(c + d*x)^6 - 15*sin(c + d*x)^6 - 21*cos(c + d*x)^2*sin
(c + d*x)^4 + cos(c + d*x)^3*sin(c + d*x)^3*105i + 35*cos(c + d*x)^4*sin(c
+ d*x)^2))/(105*d*cos(c + d*x)^7)
```

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

$$-a^2\left(\int\tan^2(c+dx)\sec^6(c+dx)\,dx+\int\left(-2i\tan(c+dx)\sec^6(c+dx)\right)dx+\int\left(-\sec^6(c+dx)\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6*(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -a**2*(Integral(tan(c + d*x)**2*sec(c + d*x)**6, x) + Integral(-2*I*tan(c +
 d*x)*sec(c + d*x)**6, x) + Integral(-sec(c + d*x)**6, x))
```

3.21 $\int \sec^4(c+dx)(a+ia\tan(c+dx))^2\,dx$

Optimal. Leaf size=55

$$\frac{i(a+ia\tan(c+dx))^5}{5a^3d}-\frac{i(a+ia\tan(c+dx))^4}{2a^2d}$$

```
[Out] -1/2*I*(a+I*a*tan(d*x+c))^4/a^2/d+1/5*I*(a+I*a*tan(d*x+c))^5/a^3/d
```

Rubi [A] time = 0.04, antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{i(a+ia\tan(c+dx))^5}{5a^3d}-\frac{i(a+ia\tan(c+dx))^4}{2a^2d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] ((-I/2)*(a + I*a*Tan[c + d*x])^4)/(a^2*d) + ((I/5)*(a + I*a*Tan[c + d*x])^5
)/(a^3*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^4(c+dx)(a+ia\tan(c+dx))^2\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)(a+x)^3\,dx, x, ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(2a(a+x)^3-(a+x)^4\right)\,dx, x, ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{i(a+ia\tan(c+dx))^4}{2a^2d}+\frac{i(a+ia\tan(c+dx))^5}{5a^3d}\end{aligned}$$

Mathematica [A] time = 0.50, size = 77, normalized size = 1.40

$$\frac{a^2\sec(c)\sec^5(c+dx)(-5\sin(2c+dx)+5\sin(2c+3dx)+\sin(4c+5dx)+5i\cos(2c+dx)+5\sin(dx)+5i\cos(d}{20d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (a^2*Sec[c]*Sec[c + d*x]^5*((5*I)*Cos[d*x] + (5*I)*Cos[2*c + d*x] + 5*Sin[d
*x] - 5*Sin[2*c + d*x] + 5*Sin[2*c + 3*d*x] + Sin[4*c + 5*d*x]))/(20*d)
```

fricas [B] time = 0.51, size = 113, normalized size = 2.05

$$\frac{80i\,a^2e^{(6i\,dx+6i\,c)}+80i\,a^2e^{(4i\,dx+4i\,c)}+40i\,a^2e^{(2i\,dx+2i\,c)}+8i\,a^2}{5\left(de^{(10i\,dx+10i\,c)}+5\,de^{(8i\,dx+8i\,c)}+10\,de^{(6i\,dx+6i\,c)}+10\,de^{(4i\,dx+4i\,c)}+5\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/5*(80*I*a^2*e^(6*I*d*x + 6*I*c) + 80*I*a^2*e^(4*I*d*x + 4*I*c) + 40*I*a^2
*e^(2*I*d*x + 2*I*c) + 8*I*a^2)/(d*e^(10*I*d*x + 10*I*c) + 5*d*e^(8*I*d*x +
 8*I*c) + 10*d*e^(6*I*d*x + 6*I*c) + 10*d*e^(4*I*d*x + 4*I*c) + 5*d*e^(2*I*
d*x + 2*I*c) + d)
```

giac [A] time = 0.95, size = 56, normalized size = 1.02

$$-\frac{2\,a^2\tan\left(dx+c\right)^5-5i\,a^2\tan\left(dx+c\right)^4-10i\,a^2\tan\left(dx+c\right)^2-10\,a^2\tan\left(dx+c\right)}{10\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -1/10*(2*a^2*tan(d*x + c)^5 - 5*I*a^2*tan(d*x + c)^4 - 10*I*a^2*tan(d*x + c
)^2 - 10*a^2*tan(d*x + c))/d
```

maple [A] time = 0.42, size = 85, normalized size = 1.55

$$\frac{-a^2\left(\frac{\sin^3(dx+c)}{5\cos(dx+c)^5}+\frac{2\left(\sin^3(dx+c)\right)}{15\cos(dx+c)^3}\right)+\frac{ia^2}{2\cos(dx+c)^4}-a^2\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan\left(dx+c\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(-a^2*(1/5*sin(d*x+c)^3/cos(d*x+c)^5+2/15*sin(d*x+c)^3/cos(d*x+c)^3)+1/
2*I*a^2/cos(d*x+c)^4-a^2*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c))
```

maxima [A] time = 0.41, size = 56, normalized size = 1.02

$$-\frac{6\,a^2\tan\left(dx+c\right)^5-15i\,a^2\tan\left(dx+c\right)^4-30i\,a^2\tan\left(dx+c\right)^2-30\,a^2\tan\left(dx+c\right)}{30\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/30*(6*a^2*tan(d*x + c)^5 - 15*I*a^2*tan(d*x + c)^4 - 30*I*a^2*tan(d*x +
c)^2 - 30*a^2*tan(d*x + c))/d
```

mupad [B] time = 3.22, size = 56, normalized size = 1.02

$$\frac{-\frac{a^2\tan(c+d\,x)^5}{5}+\frac{a^2\tan(c+d\,x)^4\,1\mathrm{i}}{2}+a^2\tan\left(c+d\,x\right)^2\,1\mathrm{i}+a^2\tan\left(c+d\,x\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^2/cos(c + d*x)^4,x)
```

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

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

$$-a^2\left(\int \tan^2(c+dx)\sec^4(c+dx)\,dx+\int\left(-2i\tan(c+dx)\sec^4(c+dx)\right)dx+\int\left(-\sec^4(c+dx)\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4*(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -a**2*(Integral(tan(c + d*x)**2*sec(c + d*x)**4, x) + Integral(-2*I*tan(c +
 d*x)*sec(c + d*x)**4, x) + Integral(-sec(c + d*x)**4, x))
```

3.22 $\int \sec^2(c+dx)(a+ia\tan(c+dx))^2\,dx$

Optimal. Leaf size=27

$$-\frac{i(a+ia\tan(c+dx))^3}{3ad}$$

```
[Out] -1/3*I*(a+I*a*tan(d*x+c))^3/a/d
```

Rubi [A] time = 0.04, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 32}

$$-\frac{i(a+ia\tan(c+dx))^3}{3ad}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] ((-I/3)*(a + I*a*Tan[c + d*x])^3)/(a*d)
```

Rule 32

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^2(c+dx)(a+ia\tan(c+dx))^2\,dx &= -\frac{i\,\text{Subst}\left(\int (a+x)^2\,dx, x, ia\tan(c+dx)\right)}{ad}\\ &= -\frac{i(a+ia\tan(c+dx))^3}{3ad}\end{aligned}$$

Mathematica [B] time = 0.41, size = 68, normalized size = 2.52

$$\frac{a^2\sec(c)\sec^3(c+dx)(-3\sin(2c+dx)+2\sin(2c+3dx)+3i\cos(2c+dx)+3\sin(dx)+3i\cos(dx))}{6d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (a^2*Sec[c]*Sec[c + d*x]^3*((3*I)*Cos[d*x] + (3*I)*Cos[2*c + d*x] + 3*Sin[d
*x] - 3*Sin[2*c + d*x] + 2*Sin[2*c + 3*d*x]))/(6*d)
```

fricas [B] time = 0.52, size = 75, normalized size = 2.78

$$\frac{24i\,a^2e^{(4i\,dx+4i\,c)}+24i\,a^2e^{(2i\,dx+2i\,c)}+8i\,a^2}{3\left(de^{(6i\,dx+6i\,c)}+3\,de^{(4i\,dx+4i\,c)}+3\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/3*(24*I*a^2*e^(4*I*d*x + 4*I*c) + 24*I*a^2*e^(2*I*d*x + 2*I*c) + 8*I*a^2)
/(d*e^(6*I*d*x + 6*I*c) + 3*d*e^(4*I*d*x + 4*I*c) + 3*d*e^(2*I*d*x + 2*I*c)
 + d)
```

giac [A] time = 1.10, size = 42, normalized size = 1.56

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

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

maple [B] time = 0.43, size = 51, normalized size = 1.89

$$\frac{-\frac{a^2\left(\sin^3(dx+c)\right)}{3\cos(dx+c)^3}+\frac{ia^2}{\cos(dx+c)^2}+a^2\tan\left(dx+c\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(-1/3*a^2*sin(d*x+c)^3/cos(d*x+c)^3+I*a^2/cos(d*x+c)^2+a^2*tan(d*x+c))
```

maxima [A] time = 0.31, size = 21, normalized size = 0.78

$$-\frac{i\left(i\,a\tan\left(dx+c\right)+a\right)^3}{3\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/3*I*(I*a*tan(d*x + c) + a)^3/(a*d)
```

mupad [B] time = 3.22, size = 35, normalized size = 1.30

$$\frac{a^2\tan\left(c+d\,x\right)\,\left(-\tan\left(c+d\,x\right)^2+\tan\left(c+d\,x\right)\,3\mathrm{i}+3\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^2/cos(c + d*x)^2,x)
```

```
[Out] (a^2*tan(c + d*x)*(tan(c + d*x)*3i - tan(c + d*x)^2 + 3))/(3*d)
```

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

$$-a^2\left(\int\tan^2\left(c+dx\right)\sec^2\left(c+dx\right)dx+\int\left(-2i\tan\left(c+dx\right)\sec^2\left(c+dx\right)\right)dx+\int\left(-\sec^2\left(c+dx\right)\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2*(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -a**2*(Integral(tan(c + d*x)**2*sec(c + d*x)**2, x) + Integral(-2*I*tan(c +
 d*x)*sec(c + d*x)**2, x) + Integral(-sec(c + d*x)**2, x))
```

3.23 $\int (a+ia\tan(c+dx))^2\,dx$

Optimal. Leaf size=38

$$-\frac{a^2\tan(c+dx)}{d}-\frac{2ia^2\log(\cos(c+dx))}{d}+2a^2x$$

```
[Out] 2*a^2*x-2*I*a^2*ln(cos(d*x+c))/d-a^2*tan(d*x+c)/d
```

Rubi [A] time = 0.02, antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {3477, 3475}

$$-\frac{a^2\tan(c+dx)}{d}-\frac{2ia^2\log(\cos(c+dx))}{d}+2a^2x$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] 2*a^2*x - ((2*I)*a^2*Log[Cos[c + d*x]])/d - (a^2*Tan[c + d*x])/d
```

Rule 3475

```
Int[tan[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[Log[RemoveContent[Cos[c + d
*x], x]]/d, x] /; FreeQ[{c, d}, x]
```

Rule 3477

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

Rubi steps

$$\begin{aligned}\int (a+ia\tan(c+dx))^2\,dx &= 2a^2x-\frac{a^2\tan(c+dx)}{d}+\left(2ia^2\right)\int \tan(c+dx)\,dx\\ &= 2a^2x-\frac{2ia^2\log(\cos(c+dx))}{d}-\frac{a^2\tan(c+dx)}{d}\end{aligned}$$

Mathematica [B] time = 0.78, size = 100, normalized size = 2.63

$$-\frac{a^2\sec(c)\sec(c+dx)\left(-4dx\cos(2c+dx)+\cos(dx)\left(-4dx+i\log\left(\cos^2(c+dx)\right)\right)+i\cos(2c+dx)\log\left(\cos^2(\right.\right.}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] -1/2*(a^2*Sec[c]*Sec[c + d*x]*(4*ArcTan[Tan[3*c + d*x]]*Cos[c]*Cos[c + d*x]
 - 4*d*x*Cos[2*c + d*x] + Cos[d*x]*(-4*d*x + I*Log[Cos[c + d*x]^2]) + I*Cos
[2*c + d*x]*Log[Cos[c + d*x]^2] + 2*Sin[d*x]))/d
```

fricas [A] time = 0.64, size = 55, normalized size = 1.45

$$\frac{-2ia^2+\left(-2ia^2e^{(2idx+2ic)}-2ia^2\right)\log\left(e^{(2idx+2ic)}+1\right)}{de^{(2idx+2ic)}+d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

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

giac [A] time = 0.57, size = 65, normalized size = 1.71

$$\frac{-2i\,a^2e^{(2i\,dx+2i\,c)}\log\left(e^{(2i\,dx+2i\,c)}+1\right)-2i\,a^2\log\left(e^{(2i\,dx+2i\,c)}+1\right)-2i\,a^2}{de^{(2i\,dx+2i\,c)}+d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

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

maple [A] time = 0.02, size = 51, normalized size = 1.34

$$\frac{ia^2\ln\left(1+\tan^2\left(dx+c\right)\right)}{d}-\frac{a^2\tan\left(dx+c\right)}{d}+\frac{2a^2\arctan\left(\tan\left(dx+c\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^2,x)
```

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

maxima [A] time = 0.79, size = 41, normalized size = 1.08

$$a^2x+\frac{\left(dx+c-\tan\left(dx+c\right)\right)a^2}{d}+\frac{2i\,a^2\log\left(\sec\left(dx+c\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] a^2*x + (d*x + c - tan(d*x + c))*a^2/d + 2*I*a^2*log(sec(d*x + c))/d
```

mupad [B] time = 3.23, size = 29, normalized size = 0.76

$$\frac{a^2\,\left(-\tan\left(c+d\,x\right)+\ln\left(\tan\left(c+d\,x\right)+1\mathrm{i}\right)\,2\mathrm{i}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^2,x)
```

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

sympy [A] time = 0.24, size = 53, normalized size = 1.39

$$\frac{2ia^2}{-de^{2ic}e^{2idx}-d}-\frac{2ia^2\log\left(e^{2idx}+e^{-2ic}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**2,x)
```

```
[Out] 2*I*a**2/(-d*exp(2*I*c)*exp(2*I*d*x) - d) - 2*I*a**2*log(exp(2*I*d*x) + exp
(-2*I*c))/d
```

3.24 $\int \cos^2(c+dx)(a+ia\tan(c+dx))^2\,dx$

Optimal. Leaf size=25

$$-\frac{ia^3}{d(a-ia\tan(c+dx))}$$

```
[Out] -I*a^3/d/(a-I*a*tan(d*x+c))
```

Rubi [A] time = 0.04, antiderivative size = 25, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = $\{3487, 32\}$

$$-\frac{ia^3}{d(a-ia\tan(c+dx))}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] ((-I)*a^3)/(d*(a - I*a*Tan[c + d*x]))
```

Rule 32

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \cos^2(c+dx)(a+ia\tan(c+dx))^2\,dx &= -\frac{\left(ia^3\right)\mathrm{Subst}\left(\int \frac{1}{(a-x)^2}\,dx, x, ia\tan(c+dx)\right)}{d}\\ &= -\frac{ia^3}{d(a-ia\tan(c+dx))}\end{aligned}$$

Mathematica [A] time = 0.07, size = 31, normalized size = 1.24

$$-\frac{ia^2(\cos(c+dx)+i\sin(c+dx))^2}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] ((-1/2*I)*a^2*(Cos[c + d*x] + I*Sin[c + d*x])^2)/d
```

fricas [A] time = 0.62, size = 17, normalized size = 0.68

$$-\frac{i\,a^2e^{(2i\,dx+2i\,c)}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

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

giac [A] time = 0.96, size = 17, normalized size = 0.68

$$-\frac{i\,a^2 e^{(2i\,dx+2i\,c)}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

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

maple [B] time = 0.31, size = 73, normalized size = 2.92

$$\frac{-a^2\left(-\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)-ia^2\left(\cos^2(dx+c)\right)+a^2\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(-a^2*(-1/2*cos(d*x+c)*sin(d*x+c)+1/2*d*x+1/2*c)-I*a^2*cos(d*x+c)^2+a^2
*(1/2*cos(d*x+c)*sin(d*x+c)+1/2*d*x+1/2*c))
```

maxima [A] time = 0.62, size = 32, normalized size = 1.28

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] (a^2*tan(d*x + c) - I*a^2)/((tan(d*x + c)^2 + 1)*d)
```

mupad [B] time = 3.28, size = 18, normalized size = 0.72

$$\frac{a^2}{d\,\left(\tan(c+d\,x)+1\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] a^2/(d*(tan(c + d*x) + 1i))
```

sympy [A] time = 0.18, size = 37, normalized size = 1.48

$$\begin{cases} -\frac{ia^2e^{2ic}e^{2idx}}{2d} & \text{for } 2d \neq 0 \\ a^2xe^{2ic} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2*(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Piecewise((-I*a**2*exp(2*I*c)*exp(2*I*d*x)/(2*d), Ne(2*d, 0)), (a**2*x*exp(
2*I*c), True))
```

3.25 $\int \cos^4(c+dx)(a+ia\tan(c+dx))^2\,dx$

Optimal. Leaf size=63

$$-\frac{ia^4}{4d(a-ia\tan(c+dx))^2}-\frac{ia^3}{4d(a-ia\tan(c+dx))}+\frac{a^2x}{4}$$

```
[Out] 1/4*a^2*x-1/4*I*a^4/d/(a-I*a*tan(d*x+c))^2-1/4*I*a^3/d/(a-I*a*tan(d*x+c))
```

Rubi [A] time = 0.06, antiderivative size = 63, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3487, 44, 206}

$$-\frac{ia^4}{4d(a-ia\tan(c+dx))^2}-\frac{ia^3}{4d(a-ia\tan(c+dx))}+\frac{a^2x}{4}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (a^2*x)/4 - ((I/4)*a^4)/(d*(a - I*a*Tan[c + d*x])^2) - ((I/4)*a^3)/(d*(a -
I*a*Tan[c + d*x]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 206

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^4(c+dx)(a+ia\tan(c+dx))^2\,dx=-\frac{\left(ia^5\right)\text{Subst}\left(\int\frac{1}{(a-x)^3(a+x)}\,dx,x,ia\tan(c+dx)\right)}{d}$$

$$=-\frac{\left(ia^5\right)\text{Subst}\left(\int\left(\frac{1}{2a(a-x)^3}+\frac{1}{4a^2(a-x)^2}+\frac{1}{4a^2\left(a^2-x^2\right)}\right)dx,x,ia\tan(c+dx$$

$$=-\frac{ia^4}{4d(a-ia\tan(c+dx))^2}-\frac{ia^3}{4d(a-ia\tan(c+dx))}-\frac{\left(ia^3\right)\text{Subst}\left(\int\right.}{}$$

$$=\frac{a^2x}{4}-\frac{ia^4}{4d(a-ia\tan(c+dx))^2}-\frac{ia^3}{4d(a-ia\tan(c+dx))}$$

Mathematica [A] time = 0.54, size = 86, normalized size = 1.37

$$\frac{a^2((1-4idx)\sin(2(c+dx))+(4dx-i)\cos(2(c+dx))-4i)(\cos(2(c+2dx))+i\sin(2(c+2dx)))}{16d(\cos(dx)+i\sin(dx))^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (a^2*(-4*I + (-I + 4*d*x)*Cos[2*(c + d*x)] + (1 - (4*I)*d*x)*Sin[2*(c + d*x
)])*(Cos[2*(c + 2*d*x)] + I*Sin[2*(c + 2*d*x)]))/(16*d*(Cos[d*x] + I*Sin[d*
x])^2)
```

fricas [A] time = 0.41, size = 41, normalized size = 0.65

$$\frac{4\,a^2dx-i\,a^2e^{(4i\,dx+4i\,c)}-4i\,a^2e^{(2i\,dx+2i\,c)}}{16\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/16*(4*a^2*d*x - I*a^2*e^(4*I*d*x + 4*I*c) - 4*I*a^2*e^(2*I*d*x + 2*I*c))/
d
```

giac [B] time = 1.17, size = 257, normalized size = 4.08

$$\frac{8\,a^2dxe^{(4i\,dx+2i\,c)}+16\,a^2dxe^{(2i\,dx)}+8\,a^2dxe^{(-2i\,c)}-i\,a^2e^{(4i\,dx+2i\,c)}\log\left(e^{(2i\,dx+2i\,c)}+1\right)-2i\,a^2e^{(2i\,dx)}\log\left(e^{(2i\,dx+2i\,c)}+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/32*(8*a^2*d*x*e^(4*I*d*x + 2*I*c) + 16*a^2*d*x*e^(2*I*d*x) + 8*a^2*d*x*e^
(-2*I*c) - I*a^2*e^(4*I*d*x + 2*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 2*I*a^2
*e^(2*I*d*x)*log(e^(2*I*d*x + 2*I*c) + 1) - I*a^2*e^(-2*I*c)*log(e^(2*I*d*x
 + 2*I*c) + 1) + I*a^2*e^(4*I*d*x + 2*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) +
2*I*a^2*e^(2*I*d*x)*log(e^(2*I*d*x) + e^(-2*I*c)) + I*a^2*e^(-2*I*c)*log(e^
(2*I*d*x) + e^(-2*I*c)) - 2*I*a^2*e^(8*I*d*x + 6*I*c) - 12*I*a^2*e^(6*I*d*x
 + 4*I*c) - 18*I*a^2*e^(4*I*d*x + 2*I*c) - 8*I*a^2*e^(2*I*d*x))/(d*e^(4*I*d
*x + 2*I*c) + 2*d*e^(2*I*d*x) + d*e^(-2*I*c))
```

maple [A] time = 0.48, size = 100, normalized size = 1.59

$$\frac{-a^2\left(-\frac{\sin(dx+c)\left(\cos^3(dx+c)\right)}{4}+\frac{\cos(dx+c)\sin(dx+c)}{8}+\frac{dx}{8}+\frac{c}{8}\right)-\frac{ia^2\left(\cos^4(dx+c)\right)}{2}+a^2\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(-a^2*(-1/4*sin(d*x+c)*cos(d*x+c)^3+1/8*cos(d*x+c)*sin(d*x+c)+1/8*d*x+1
/8*c)-1/2*I*a^2*cos(d*x+c)^4+a^2*(1/4*(cos(d*x+c)^3+3/2*cos(d*x+c))*sin(d*x
+c)+3/8*d*x+3/8*c))
```

maxima [A] time = 0.63, size = 67, normalized size = 1.06

$$\frac{(dx+c)a^2+\frac{a^2\tan(dx+c)^3+3\,a^2\tan(dx+c)-2i\,a^2}{\tan(dx+c)^4+2\,\tan(dx+c)^2+1}}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/4*((d*x + c)*a^2 + (a^2*tan(d*x + c)^3 + 3*a^2*tan(d*x + c) - 2*I*a^2)/(t
an(d*x + c)^4 + 2*tan(d*x + c)^2 + 1))/d
```

mupad [B] time = 3.27, size = 50, normalized size = 0.79

$$\frac{a^2 x}{4}+\frac{\frac{a^2 \tan(c+d\,x)}{4}+\frac{a^2\,1\mathrm{i}}{2}}{d\,\left({\tan\left(c+d\,x\right)}^2+\tan\left(c+d\,x\right)\,2\mathrm{i}-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^2,x)
```

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

sympy [A] time = 0.26, size = 88, normalized size = 1.40

$$\frac{a^2x}{4}+\begin{cases} \frac{-4ia^2de^{4ic}e^{4idx}-16ia^2de^{2ic}e^{2idx}}{64d^2} & \text{for } 64d^2 \neq 0 \\ x\left(\frac{a^2e^{4ic}}{4}+\frac{a^2e^{2ic}}{2}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4*(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] a**2*x/4 + Piecewise(((-4*I*a**2*d*exp(4*I*c)*exp(4*I*d*x) - 16*I*a**2*d*ex
p(2*I*c)*exp(2*I*d*x))/(64*d**2), Ne(64*d**2, 0)), (x*(a**2*exp(4*I*c)/4 +
a**2*exp(2*I*c)/2), True))
```

3.26 $\int \cos^6(c+dx)(a+ia\tan(c+dx))^2\,dx$

Optimal. Leaf size=117

$$-\frac{ia^5}{12d(a-ia\tan(c+dx))^3}-\frac{ia^4}{8d(a-ia\tan(c+dx))^2}-\frac{3ia^3}{16d(a-ia\tan(c+dx))}+\frac{ia^3}{16d(a+ia\tan(c+dx))}+\frac{a^2x}{4}$$

```
[Out] 1/4*a^2*x-1/12*I*a^5/d/(a-I*a*tan(d*x+c))^3-1/8*I*a^4/d/(a-I*a*tan(d*x+c))^
2-3/16*I*a^3/d/(a-I*a*tan(d*x+c))+1/16*I*a^3/d/(a+I*a*tan(d*x+c))
```

Rubi [A] time = 0.08, antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3487, 44, 206}

$$-\frac{ia^5}{12d(a-ia\tan(c+dx))^3}-\frac{ia^4}{8d(a-ia\tan(c+dx))^2}-\frac{3ia^3}{16d(a-ia\tan(c+dx))}+\frac{ia^3}{16d(a+ia\tan(c+dx))}+\frac{a^2x}{4}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^6*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (a^2*x)/4 - ((I/12)*a^5)/(d*(a - I*a*Tan[c + d*x])^3) - ((I/8)*a^4)/(d*(a -
 I*a*Tan[c + d*x])^2) - (((3*I)/16)*a^3)/(d*(a - I*a*Tan[c + d*x])) + ((I/1
6)*a^3)/(d*(a + I*a*Tan[c + d*x]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 206

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^6(c+dx)(a+ia\tan(c+dx))^2\,dx = -\frac{\left(ia^7\right)\text{Subst}\left(\int \frac{1}{(a-x)^4(a+x)^2}\,dx,x,ia\tan(c+dx)\right)}{d}$$

$$= -\frac{\left(ia^7\right)\text{Subst}\left(\int \left(\frac{1}{4a^2(a-x)^4}+\frac{1}{4a^3(a-x)^3}+\frac{3}{16a^4(a-x)^2}+\frac{1}{16a^4(a+x)^2}+\frac{1}{4a^4\left(a^2-x^2\right.}\right.\right.}{d}$$

$$= -\frac{ia^5}{12d(a-ia\tan(c+dx))^3}-\frac{ia^4}{8d(a-ia\tan(c+dx))^2}-\frac{3ia^3}{16d(a-ia\tan(c\right.}$$

$$= \frac{a^2x}{4}-\frac{ia^5}{12d(a-ia\tan(c+dx))^3}-\frac{ia^4}{8d(a-ia\tan(c+dx))^2}-\frac{3i}{16d(a-ia\,t}$$

Mathematica [A] time = 0.55, size = 116, normalized size = 0.99

$$\frac{a^2(-12idx\sin(2(c+dx))+3\sin(2(c+dx))+2\sin(4(c+dx))+3(4dx-i)\cos(2(c+dx))+i\cos(4(c+dx))-}{48d(\cos(dx)+i\sin(dx))^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^6*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (a^2*(-9*I + 3*(-I + 4*d*x)*Cos[2*(c + d*x)] + I*Cos[4*(c + d*x)] + 3*Sin[2
*(c + d*x)] - (12*I)*d*x*Sin[2*(c + d*x)] + 2*Sin[4*(c + d*x)])*(Cos[2*(c +
 2*d*x)] + I*Sin[2*(c + 2*d*x)]))/(48*d*(Cos[d*x] + I*Sin[d*x])^2)
```

fricas [A] time = 0.62, size = 78, normalized size = 0.67

$$\frac{\left(24\,a^2dxe^{(2i\,dx+2i\,c)}-i\,a^2e^{(8i\,dx+8i\,c)}-6i\,a^2e^{(6i\,dx+6i\,c)}-18i\,a^2e^{(4i\,dx+4i\,c)}+3i\,a^2\right)e^{(-2i\,dx-2i\,c)}}{96\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/96*(24*a^2*d*x*e^(2*I*d*x + 2*I*c) - I*a^2*e^(8*I*d*x + 8*I*c) - 6*I*a^2*
e^(6*I*d*x + 6*I*c) - 18*I*a^2*e^(4*I*d*x + 4*I*c) + 3*I*a^2)*e^(-2*I*d*x -
 2*I*c)/d
```

giac [A] time = 1.11, size = 169, normalized size = 1.44

$$\frac{96\,a^2dxe^{(6i\,dx+4i\,c)}+192\,a^2dxe^{(4i\,dx+2i\,c)}+96\,a^2dxe^{(2i\,dx)}-4i\,a^2e^{(12i\,dx+10i\,c)}-32i\,a^2e^{(10i\,dx+8i\,c)}-124i\,a^2e^{(8i\,dx+6i\,c}}{384\left(de^{(6i\,dx+4i\,c)}+2\,de^{(4i\,dx+2i\,c)}+de^{(2i\,dx)}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/384*(96*a^2*d*x*e^(6*I*d*x + 4*I*c) + 192*a^2*d*x*e^(4*I*d*x + 2*I*c) + 9
6*a^2*d*x*e^(2*I*d*x) - 4*I*a^2*e^(12*I*d*x + 10*I*c) - 32*I*a^2*e^(10*I*d*
x + 8*I*c) - 124*I*a^2*e^(8*I*d*x + 6*I*c) - 168*I*a^2*e^(6*I*d*x + 4*I*c)
- 60*I*a^2*e^(4*I*d*x + 2*I*c) + 24*I*a^2*e^(2*I*d*x) + 12*I*a^2*e^(-2*I*c)
)/(d*e^(6*I*d*x + 4*I*c) + 2*d*e^(4*I*d*x + 2*I*c) + d*e^(2*I*d*x))
```

maple [A] time = 0.52, size = 121, normalized size = 1.03

$$\frac{-a^2\left(-\frac{\sin(dx+c)\left(\cos^5(dx+c)\right)}{6}+\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{24}+\frac{dx}{16}+\frac{c}{16}\right)-\frac{ia^2\left(\cos^6(dx+c)\right)}{3}+a^2\left(\frac{\left(\cos^5(dx+c)+\frac{5\left(\cos^3(dx+c)\right)}{4}+\frac{1}{}\right.}{6}\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(-a^2*(-1/6*sin(d*x+c)*cos(d*x+c)^5+1/24*(cos(d*x+c)^3+3/2*cos(d*x+c))*
sin(d*x+c)+1/16*d*x+1/16*c)-1/3*I*a^2*cos(d*x+c)^6+a^2*(1/6*(cos(d*x+c)^5+5
/4*cos(d*x+c)^3+15/8*cos(d*x+c))*sin(d*x+c)+5/16*d*x+5/16*c))
```

maxima [A] time = 0.72, size = 92, normalized size = 0.79

$$\frac{3\,(dx+c)a^2+\frac{3\,a^2\tan(dx+c)^5+8\,a^2\tan(dx+c)^3+9\,a^2\tan(dx+c)-4i\,a^2}{\tan(dx+c)^6+3\,\tan(dx+c)^4+3\,\tan(dx+c)^2+1}}{12\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/12*(3*(d*x + c)*a^2 + (3*a^2*tan(d*x + c)^5 + 8*a^2*tan(d*x + c)^3 + 9*a^
2*tan(d*x + c) - 4*I*a^2)/(tan(d*x + c)^6 + 3*tan(d*x + c)^4 + 3*tan(d*x +
c)^2 + 1))/d
```

mupad [B] time = 3.37, size = 88, normalized size = 0.75

$$\frac{a^2 x}{4}+\frac{\frac{a^2 \tan(c+d\,x)^3}{4}+\frac{a^2 \tan(c+d\,x)^2\,1\mathrm{i}}{2}-\frac{a^2 \tan(c+d\,x)}{12}+\frac{a^2\,1\mathrm{i}}{3}}{d\,\left(\tan\left(c+d\,x\right)^4+\tan\left(c+d\,x\right)^3\,2\mathrm{i}+\tan\left(c+d\,x\right)\,2\mathrm{i}-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] (a^2*x)/4 + ((a^2*1i)/3 - (a^2*tan(c + d*x))/12 + (a^2*tan(c + d*x)^2*1i)/2
 + (a^2*tan(c + d*x)^3)/4)/(d*(tan(c + d*x)*2i + tan(c + d*x)^3*2i + tan(c
+ d*x)^4 - 1))
```

sympy [A] time = 0.40, size = 187, normalized size = 1.60

$$\frac{a^2 x}{4}+\begin{cases}\frac{\left(-8192ia^2d^3e^{8ic}e^{6idx}-49152ia^2d^3e^{6ic}e^{4idx}-147456ia^2d^3e^{4ic}e^{2idx}+24576ia^2d^3e^{-2idx}\right)e^{-2ic}}{786432d^4} & \text{for } 786432d^4e^{2ic}\neq 0\\ x\left(-\frac{a^2}{4}+\frac{\left(a^2e^{8ic}+4a^2e^{6ic}+6a^2e^{4ic}+4a^2e^{2ic}+a^2\right)e^{-2ic}}{16}\right) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**6*(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] a**2*x/4 + Piecewise(((-8192*I*a**2*d**3*exp(8*I*c)*exp(6*I*d*x) - 49152*I*
a**2*d**3*exp(6*I*c)*exp(4*I*d*x) - 147456*I*a**2*d**3*exp(4*I*c)*exp(2*I*d
*x) + 24576*I*a**2*d**3*exp(-2*I*d*x))*exp(-2*I*c)/(786432*d**4), Ne(786432
*d**4*exp(2*I*c), 0)), (x*(-a**2/4 + (a**2*exp(8*I*c) + 4*a**2*exp(6*I*c) +
 6*a**2*exp(4*I*c) + 4*a**2*exp(2*I*c) + a**2)*exp(-2*I*c)/16), True))
```

3.27 $\int \cos^8(c+dx)(a+ia\tan(c+dx))^2\,dx$

Optimal. Leaf size=171

$$-\frac{ia^6}{32d(a-ia\tan(c+dx))^4}-\frac{ia^5}{16d(a-ia\tan(c+dx))^3}-\frac{3ia^4}{32d(a-ia\tan(c+dx))^2}+\frac{ia^4}{64d(a+ia\tan(c+dx))^2}-\frac{}{32d}$$

```
[Out] 15/64*a^2*x-1/32*I*a^6/d/(a-I*a*tan(d*x+c))^4-1/16*I*a^5/d/(a-I*a*tan(d*x+c
))^3-3/32*I*a^4/d/(a-I*a*tan(d*x+c))^2-5/32*I*a^3/d/(a-I*a*tan(d*x+c))+1/64
*I*a^4/d/(a+I*a*tan(d*x+c))^2+5/64*I*a^3/d/(a+I*a*tan(d*x+c))
```

Rubi [A] time = 0.11, antiderivative size = 171, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = $\{3487, 44, 206\}$

$$-\frac{ia^6}{32d(a-ia\tan(c+dx))^4}-\frac{ia^5}{16d(a-ia\tan(c+dx))^3}-\frac{3ia^4}{32d(a-ia\tan(c+dx))^2}+\frac{ia^4}{64d(a+ia\tan(c+dx))^2}-\frac{}{32d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^8*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (15*a^2*x)/64 - ((I/32)*a^6)/(d*(a - I*a*Tan[c + d*x])^4) - ((I/16)*a^5)/(d
*(a - I*a*Tan[c + d*x])^3) - (((3*I)/32)*a^4)/(d*(a - I*a*Tan[c + d*x])^2)
- (((5*I)/32)*a^3)/(d*(a - I*a*Tan[c + d*x])) + ((I/64)*a^4)/(d*(a + I*a*Ta
n[c + d*x])^2) + (((5*I)/64)*a^3)/(d*(a + I*a*Tan[c + d*x]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 206

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^8(c+dx)(a+ia\tan(c+dx))^2\,dx = -\frac{(ia^9)\,\text{Subst}\left(\int \frac{1}{(a-x)^5(a+x)^3}\,dx, x, ia\tan(c+dx)\right)}{d}$$
$$= -\frac{(ia^9)\,\text{Subst}\left(\int \left(\frac{1}{8a^3(a-x)^5} + \frac{3}{16a^4(a-x)^4} + \frac{3}{16a^5(a-x)^3} + \frac{5}{32a^6(a-x)^2} + \frac{1}{32a^5(a+x}\right.\right.}{d}$$
$$= -\frac{ia^6}{32d(a-ia\tan(c+dx))^4} - \frac{ia^5}{16d(a-ia\tan(c+dx))^3} - \frac{3ia^4}{32d(a-ia\tan(}$$
$$= \frac{15a^2x}{64} - \frac{ia^6}{32d(a-ia\tan(c+dx))^4} - \frac{ia^5}{16d(a-ia\tan(c+dx))^3} - \frac{}{32d(a-}$$

Mathematica [A] time = 0.59, size = 138, normalized size = 0.81

$$\frac{a^2(-120idx\sin(2(c+dx)) + 30\sin(2(c+dx)) + 32\sin(4(c+dx)) + 3\sin(6(c+dx)) + 30(4dx-i)\cos(2(c+dx))}{512d(\cos(dx)+i\sin(dx))^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^8*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (a^2*(-80*I + 30*(-I + 4*d*x)*Cos[2*(c + d*x)] + (16*I)*Cos[4*(c + d*x)] +
I*Cos[6*(c + d*x)] + 30*Sin[2*(c + d*x)] - (120*I)*d*x*Sin[2*(c + d*x)] + 3
2*Sin[4*(c + d*x)] + 3*Sin[6*(c + d*x)])*(Cos[2*(c + 2*d*x)] + I*Sin[2*(c +
 2*d*x)]))/(512*d*(Cos[d*x] + I*Sin[d*x])^2)
```

fricas [A] time = 0.56, size = 106, normalized size = 0.62

$$\frac{\left(120\,a^2dxe^{(4i\,dx+4i\,c)} - i\,a^2e^{(12i\,dx+12i\,c)} - 8i\,a^2e^{(10i\,dx+10i\,c)} - 30i\,a^2e^{(8i\,dx+8i\,c)} - 80i\,a^2e^{(6i\,dx+6i\,c)} + 24i\,a^2e^{(2i\,dx+2i\,c)} + 2\right.}{512\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^8*(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/512*(120*a^2*d*x*e^(4*I*d*x + 4*I*c) - I*a^2*e^(12*I*d*x + 12*I*c) - 8*I*
a^2*e^(10*I*d*x + 10*I*c) - 30*I*a^2*e^(8*I*d*x + 8*I*c) - 80*I*a^2*e^(6*I*
d*x + 6*I*c) + 24*I*a^2*e^(2*I*d*x + 2*I*c) + 2*I*a^2)*e^(-4*I*d*x - 4*I*c)
/d
```

giac [B] time = 2.03, size = 342, normalized size = 2.00

$$\frac{120\,a^2dxe^{(8i\,dx+4i\,c)} + 240\,a^2dxe^{(6i\,dx+2i\,c)} + 120\,a^2dxe^{(4i\,dx)} + 8i\,a^2e^{(8i\,dx+4i\,c)}\log\left(e^{(2i\,dx+2i\,c)}+1\right) + 16i\,a^2e^{(6i\,dx+2i\,c)}\,\mathrm{l}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^8*(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/512*(120*a^2*d*x*e^(8*I*d*x + 4*I*c) + 240*a^2*d*x*e^(6*I*d*x + 2*I*c) +
120*a^2*d*x*e^(4*I*d*x) + 8*I*a^2*e^(8*I*d*x + 4*I*c)*log(e^(2*I*d*x + 2*I*
c) + 1) + 16*I*a^2*e^(6*I*d*x + 2*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) + 8*I*a
^2*e^(4*I*d*x)*log(e^(2*I*d*x + 2*I*c) + 1) - 8*I*a^2*e^(8*I*d*x + 4*I*c)*l
og(e^(2*I*d*x) + e^(-2*I*c)) - 16*I*a^2*e^(6*I*d*x + 2*I*c)*log(e^(2*I*d*x)
 + e^(-2*I*c)) - 8*I*a^2*e^(4*I*d*x)*log(e^(2*I*d*x) + e^(-2*I*c)) - I*a^2*
e^(16*I*d*x + 12*I*c) - 10*I*a^2*e^(14*I*d*x + 10*I*c) - 47*I*a^2*e^(12*I*d
*x + 8*I*c) - 148*I*a^2*e^(10*I*d*x + 6*I*c) - 190*I*a^2*e^(8*I*d*x + 4*I*c
```

```
) - 56*I*a^2*e^(6*I*d*x + 2*I*c) + 28*I*a^2*e^(2*I*d*x - 2*I*c) + 50*I*a^2*
e^(4*I*d*x) + 2*I*a^2*e^(-4*I*c))/(d*e^(8*I*d*x + 4*I*c) + 2*d*e^(6*I*d*x +
 2*I*c) + d*e^(4*I*d*x))
```

maple [A] time = 0.54, size = 141, normalized size = 0.82

$$\frac{-a^2\left(-\frac{\sin(dx+c)\left(\cos^7(dx+c)\right)}{8}+\frac{\left(\cos^5(dx+c)+\frac{5\left(\cos^3(dx+c)\right)}{4}+\frac{15\cos(dx+c)}{8}\right)\sin(dx+c)}{48}+\frac{5dx}{128}+\frac{5c}{128}\right)-\frac{ia^2\left(\cos^8(dx+c)\right)}{4}+a^2\left(\left(\cos^7(dx+c)\right.\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^8*(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(-a^2*(-1/8*sin(d*x+c)*cos(d*x+c)^7+1/48*(cos(d*x+c)^5+5/4*cos(d*x+c)^3
+15/8*cos(d*x+c))*sin(d*x+c)+5/128*d*x+5/128*c)-1/4*I*a^2*cos(d*x+c)^8+a^2*
(1/8*(cos(d*x+c)^7+7/6*cos(d*x+c)^5+35/24*cos(d*x+c)^3+35/16*cos(d*x+c))*si
n(d*x+c)+35/128*d*x+35/128*c))
```

maxima [A] time = 0.49, size = 115, normalized size = 0.67

$$\frac{15\,(dx+c)a^2+\frac{15\,a^2\tan(dx+c)^7+55\,a^2\tan(dx+c)^5+73\,a^2\tan(dx+c)^3+49\,a^2\tan(dx+c)-16i\,a^2}{\tan(dx+c)^8+4\,\tan(dx+c)^6+6\,\tan(dx+c)^4+4\,\tan(dx+c)^2+1}}{64\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^8*(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/64*(15*(d*x + c)*a^2 + (15*a^2*tan(d*x + c)^7 + 55*a^2*tan(d*x + c)^5 + 7
3*a^2*tan(d*x + c)^3 + 49*a^2*tan(d*x + c) - 16*I*a^2)/(tan(d*x + c)^8 + 4*
tan(d*x + c)^6 + 6*tan(d*x + c)^4 + 4*tan(d*x + c)^2 + 1))/d
```

mupad [B] time = 4.03, size = 144, normalized size = 0.84

$$\frac{15\,a^2\,x}{64}+\frac{\frac{15\,a^2\,\tan(c+d\,x)^5}{64}+\frac{a^2\,\tan(c+d\,x)^4\,15\mathrm{i}}{32}+\frac{5\,a^2\,\tan(c+d\,x)^3}{32}+\frac{a^2\,\tan(c+d\,x)^2\,25\mathrm{i}}{32}-\frac{17\,a^2\,\tan(c+d\,x)}{64}+\frac{a^2\,1\mathrm{i}}{4}}{d\,\left(\tan\left(c+d\,x\right)^6+\tan\left(c+d\,x\right)^5\,2\mathrm{i}+\tan\left(c+d\,x\right)^4+\tan\left(c+d\,x\right)^3\,4\mathrm{i}-\tan\left(c+d\,x\right)^2+\tan\left(c+d\,x\right)\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^8*(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] (15*a^2*x)/64 + ((a^2*1i)/4 - (17*a^2*tan(c + d*x))/64 + (a^2*tan(c + d*x)^
2*25i)/32 + (5*a^2*tan(c + d*x)^3)/32 + (a^2*tan(c + d*x)^4*15i)/32 + (15*a
^2*tan(c + d*x)^5)/64)/(d*(tan(c + d*x)*2i - tan(c + d*x)^2 + tan(c + d*x)^
3*4i + tan(c + d*x)^4 + tan(c + d*x)^5*2i + tan(c + d*x)^6 - 1))
```

sympy [A] time = 0.53, size = 272, normalized size = 1.59

$$\frac{15a^2x}{64}+\begin{cases}\frac{\left(-8589934592ia^2d^5e^{14ic}e^{8idx}-68719476736ia^2d^5e^{12ic}e^{6idx}-257698037760ia^2d^5e^{10ic}e^{4idx}-687194767360ia^2d^5e^{8ic}e^{2idx}+206158430208\right.}{4398046511104d^6}\\ x\left(-\frac{15a^2}{64}+\frac{\left(a^2e^{12ic}+6a^2e^{10ic}+15a^2e^{8ic}+20a^2e^{6ic}+15a^2e^{4ic}+6a^2e^{2ic}+a^2\right)e^{-4ic}}{64}\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**8*(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] 15*a**2*x/64 + Piecewise(((-8589934592*I*a**2*d**5*exp(14*I*c)*exp(8*I*d*x)
 - 68719476736*I*a**2*d**5*exp(12*I*c)*exp(6*I*d*x) - 257698037760*I*a**2*d
```

```
**5*exp(10*I*c)*exp(4*I*d*x) - 687194767360*I*a**2*d**5*exp(8*I*c)*exp(2*I*
d*x) + 206158430208*I*a**2*d**5*exp(4*I*c)*exp(-2*I*d*x) + 17179869184*I*a*
*2*d**5*exp(2*I*c)*exp(-4*I*d*x))*exp(-6*I*c)/(4398046511104*d**6), Ne(4398
046511104*d**6*exp(6*I*c), 0)), (x*(-15*a**2/64 + (a**2*exp(12*I*c) + 6*a**
2*exp(10*I*c) + 15*a**2*exp(8*I*c) + 20*a**2*exp(6*I*c) + 15*a**2*exp(4*I*c
) + 6*a**2*exp(2*I*c) + a**2)*exp(-4*I*c)/64), True))
```

3.28 $\int \sec^5(c+dx)(a+ia\tan(c+dx))^2\,dx$

Optimal. Leaf size=118

$$\frac{7ia^2\sec^5(c+dx)}{30d}+\frac{7a^2\tanh^{-1}(\sin(c+dx))}{16d}+\frac{i\sec^5(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{6d}+\frac{7a^2\tan(c+dx)\sec^3(c+dx)}{24d}$$

```
[Out] 7/16*a^2*arctanh(sin(d*x+c))/d+7/30*I*a^2*sec(d*x+c)^5/d+7/16*a^2*sec(d*x+c
)*tan(d*x+c)/d+7/24*a^2*sec(d*x+c)^3*tan(d*x+c)/d+1/6*I*sec(d*x+c)^5*(a^2+I
*a^2*tan(d*x+c))/d
```

Rubi [A] time = 0.09, antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {3498, 3486, 3768, 3770}

$$\frac{7ia^2\sec^5(c+dx)}{30d}+\frac{7a^2\tanh^{-1}(\sin(c+dx))}{16d}+\frac{i\sec^5(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{6d}+\frac{7a^2\tan(c+dx)\sec^3(c+dx)}{24d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^5*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (7*a^2*ArcTanh[Sin[c + d*x]])/(16*d) + (((7*I)/30)*a^2*Sec[c + d*x]^5)/d +
(7*a^2*Sec[c + d*x]*Tan[c + d*x])/(16*d) + (7*a^2*Sec[c + d*x]^3*Tan[c + d*
x])/(24*d) + ((I/6)*Sec[c + d*x]^5*(a^2 + I*a^2*Tan[c + d*x]))/d
```

Rule 3486

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

Rule 3498

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

Rule 3768

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \sec^5(c+dx)(a+ia\tan(c+dx))^2\,dx = \frac{i\sec^5(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{6d} + \frac{1}{6}(7a)\int \sec^5(c+dx)(a+ia\tan$$

$$= \frac{7ia^2\sec^5(c+dx)}{30d} + \frac{i\sec^5(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{6d} + \frac{1}{6}\left(7a^2\right)\int \mathrm{s}$$

$$= \frac{7ia^2\sec^5(c+dx)}{30d} + \frac{7a^2\sec^3(c+dx)\tan(c+dx)}{24d} + \frac{i\sec^5(c+dx)\left(a^2+\right.}{6d}$$

$$= \frac{7ia^2\sec^5(c+dx)}{30d} + \frac{7a^2\sec(c+dx)\tan(c+dx)}{16d} + \frac{7a^2\sec^3(c+dx)\tan(}{24d}$$

$$= \frac{7a^2\tanh^{-1}(\sin(c+dx))}{16d} + \frac{7ia^2\sec^5(c+dx)}{30d} + \frac{7a^2\sec(c+dx)\tan(c+}{16d}$$

Mathematica [A] time = 1.26, size = 159, normalized size = 1.35

$$\frac{a^2(\cos(2c)-i\sin(2c))(\tan(c+dx)-i)^2\sec^4(c+dx)\left(150\sin(c+dx)-35(17\sin(3(c+dx))+3\sin(5(c+dx)))\right.}{3840d(\mathrm{c}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^5*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (a^2*Sec[c + d*x]^4*(Cos[2*c] - I*Sin[2*c])*((-1536*I)*Cos[c + d*x] + 1680*
Cos[c + d*x]^6*(Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - Log[Cos[(c + d*x
)/2] + Sin[(c + d*x)/2]]) + 150*Sin[c + d*x] - 35*(17*Sin[3*(c + d*x)] + 3*
Sin[5*(c + d*x)]))*(-I + Tan[c + d*x])^2)/(3840*d*(Cos[d*x] + I*Sin[d*x])^2
)
```

fricas [B] time = 0.47, size = 364, normalized size = 3.08

$$\frac{-210i\,a^2e^{(11i\,dx+11i\,c)} - 1190i\,a^2e^{(9i\,dx+9i\,c)} + 3372i\,a^2e^{(7i\,dx+7i\,c)} + 2772i\,a^2e^{(5i\,dx+5i\,c)} + 1190i\,a^2e^{(3i\,dx+3i\,c)} + 210i\,a^2e^{(}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/240*(-210*I*a^2*e^(11*I*d*x + 11*I*c) - 1190*I*a^2*e^(9*I*d*x + 9*I*c) +
3372*I*a^2*e^(7*I*d*x + 7*I*c) + 2772*I*a^2*e^(5*I*d*x + 5*I*c) + 1190*I*a^
2*e^(3*I*d*x + 3*I*c) + 210*I*a^2*e^(I*d*x + I*c) + 105*(a^2*e^(12*I*d*x +
12*I*c) + 6*a^2*e^(10*I*d*x + 10*I*c) + 15*a^2*e^(8*I*d*x + 8*I*c) + 20*a^2
*e^(6*I*d*x + 6*I*c) + 15*a^2*e^(4*I*d*x + 4*I*c) + 6*a^2*e^(2*I*d*x + 2*I*
c) + a^2)*log(e^(I*d*x + I*c) + I) - 105*(a^2*e^(12*I*d*x + 12*I*c) + 6*a^2
*e^(10*I*d*x + 10*I*c) + 15*a^2*e^(8*I*d*x + 8*I*c) + 20*a^2*e^(6*I*d*x + 6
*I*c) + 15*a^2*e^(4*I*d*x + 4*I*c) + 6*a^2*e^(2*I*d*x + 2*I*c) + a^2)*log(e
^(I*d*x + I*c) - I))/(d*e^(12*I*d*x + 12*I*c) + 6*d*e^(10*I*d*x + 10*I*c) +
 15*d*e^(8*I*d*x + 8*I*c) + 20*d*e^(6*I*d*x + 6*I*c) + 15*d*e^(4*I*d*x + 4*
I*c) + 6*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [B] time = 1.00, size = 237, normalized size = 2.01

$$\frac{105\,a^2\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right) - 105\,a^2\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right) + \frac{2\left(135\,a^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{11} - 480i\,a^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{10} - 44\right.}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/240*(105*a^2*log(tan(1/2*d*x + 1/2*c) + 1) - 105*a^2*log(tan(1/2*d*x + 1/
2*c) - 1) + 2*(135*a^2*tan(1/2*d*x + 1/2*c)^11 - 480*I*a^2*tan(1/2*d*x + 1/
2*c)^10 - 445*a^2*tan(1/2*d*x + 1/2*c)^9 + 480*I*a^2*tan(1/2*d*x + 1/2*c)^8
 - 330*a^2*tan(1/2*d*x + 1/2*c)^7 - 960*I*a^2*tan(1/2*d*x + 1/2*c)^6 - 330*
a^2*tan(1/2*d*x + 1/2*c)^5 + 960*I*a^2*tan(1/2*d*x + 1/2*c)^4 - 445*a^2*tan
(1/2*d*x + 1/2*c)^3 - 96*I*a^2*tan(1/2*d*x + 1/2*c)^2 + 135*a^2*tan(1/2*d*x
 + 1/2*c) + 96*I*a^2)/(tan(1/2*d*x + 1/2*c)^2 - 1)^6)/d
```

maple [A] time = 0.44, size = 169, normalized size = 1.43

$$-\frac{a^2\left(\sin^3(dx+c)\right)}{6d\cos(dx+c)^6}-\frac{a^2\left(\sin^3(dx+c)\right)}{8d\cos(dx+c)^4}-\frac{a^2\left(\sin^3(dx+c)\right)}{16d\cos(dx+c)^2}-\frac{a^2\sin(dx+c)}{16d}+\frac{7a^2\ln(\sec(dx+c)+\tan(dx+c)}{16d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^5*(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] -1/6/d*a^2*sin(d*x+c)^3/cos(d*x+c)^6-1/8/d*a^2*sin(d*x+c)^3/cos(d*x+c)^4-1/
16/d*a^2*sin(d*x+c)^3/cos(d*x+c)^2-1/16*a^2*sin(d*x+c)/d+7/16/d*a^2*ln(sec(
d*x+c)+tan(d*x+c))+2/5*I/d*a^2/cos(d*x+c)^5+1/4*a^2*sec(d*x+c)^3*tan(d*x+c)
/d+3/8*a^2*sec(d*x+c)*tan(d*x+c)/d
```

maxima [A] time = 0.70, size = 181, normalized size = 1.53

$$-\frac{5a^2\left(\frac{2\left(3\sin(dx+c)^5-8\sin(dx+c)^3-3\sin(dx+c)\right)}{\sin(dx+c)^6-3\sin(dx+c)^4+3\sin(dx+c)^2-1}-3\log(\sin(dx+c)+1)+3\log(\sin(dx+c)-1)\right)+30a^2\left(\frac{2\left(3\sin(d\right.}{\sin(dx+c)}\right.}{480d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/480*(5*a^2*(2*(3*sin(d*x + c)^5 - 8*sin(d*x + c)^3 - 3*sin(d*x + c))/(si
n(d*x + c)^6 - 3*sin(d*x + c)^4 + 3*sin(d*x + c)^2 - 1) - 3*log(sin(d*x + c
) + 1) + 3*log(sin(d*x + c) - 1)) + 30*a^2*(2*(3*sin(d*x + c)^3 - 5*sin(d*x
 + c))/(sin(d*x + c)^4 - 2*sin(d*x + c)^2 + 1) - 3*log(sin(d*x + c) + 1) +
3*log(sin(d*x + c) - 1)) - 192*I*a^2/cos(d*x + c)^5)/d
```

mupad [B] time = 7.15, size = 290, normalized size = 2.46

$$\frac{7a^2\operatorname{atanh}\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right)}{8d}-\frac{-\frac{9a^2\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{11}}{8}+a^2\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{10}4i+\frac{89a^2\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^9}{24}-a^2\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^8 4i+\frac{11}{}}{d\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{12}-6\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{1}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^2/cos(c + d*x)^5,x)
```

```
[Out] (7*a^2*atanh(tan(c/2 + (d*x)/2)))/(8*d) - ((a^2*tan(c/2 + (d*x)/2)^2*4i)/5
+ (89*a^2*tan(c/2 + (d*x)/2)^3)/24 - a^2*tan(c/2 + (d*x)/2)^4*8i + (11*a^2*
tan(c/2 + (d*x)/2)^5)/4 + a^2*tan(c/2 + (d*x)/2)^6*8i + (11*a^2*tan(c/2 + (
d*x)/2)^7)/4 - a^2*tan(c/2 + (d*x)/2)^8*4i + (89*a^2*tan(c/2 + (d*x)/2)^9)/
24 + a^2*tan(c/2 + (d*x)/2)^10*4i - (9*a^2*tan(c/2 + (d*x)/2)^11)/8 - (a^2*
4i)/5 - (9*a^2*tan(c/2 + (d*x)/2))/8)/(d*(15*tan(c/2 + (d*x)/2)^4 - 6*tan(c
/2 + (d*x)/2)^2 - 20*tan(c/2 + (d*x)/2)^6 + 15*tan(c/2 + (d*x)/2)^8 - 6*tan
(c/2 + (d*x)/2)^10 + tan(c/2 + (d*x)/2)^12 + 1))
```

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

$$-a^2\left(\int\tan^2(c+dx)\sec^5(c+dx)\,dx+\int\left(-2i\tan(c+dx)\sec^5(c+dx)\right)dx+\int\left(-\sec^5(c+dx)\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**5*(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -a**2*(Integral(tan(c + d*x)**2*sec(c + d*x)**5, x) + Integral(-2*I*tan(c +
 d*x)*sec(c + d*x)**5, x) + Integral(-sec(c + d*x)**5, x))
```

3.29 $\int \sec^3(c+dx)(a+ia\tan(c+dx))^2\,dx$

Optimal. Leaf size=94

$$\frac{5ia^2\sec^3(c+dx)}{12d}+\frac{5a^2\tanh^{-1}(\sin(c+dx))}{8d}+\frac{i\sec^3(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{4d}+\frac{5a^2\tan(c+dx)\sec(c+dx)}{8d}$$

```
[Out] 5/8*a^2*arctanh(sin(d*x+c))/d+5/12*I*a^2*sec(d*x+c)^3/d+5/8*a^2*sec(d*x+c)*
tan(d*x+c)/d+1/4*I*sec(d*x+c)^3*(a^2+I*a^2*tan(d*x+c))/d
```

Rubi [A] time = 0.08, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {3498, 3486, 3768, 3770}

$$\frac{5ia^2\sec^3(c+dx)}{12d}+\frac{5a^2\tanh^{-1}(\sin(c+dx))}{8d}+\frac{i\sec^3(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{4d}+\frac{5a^2\tan(c+dx)\sec(c+dx)}{8d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (5*a^2*ArcTanh[Sin[c + d*x]])/(8*d) + (((5*I)/12)*a^2*Sec[c + d*x]^3)/d + (
5*a^2*Sec[c + d*x]*Tan[c + d*x])/(8*d) + ((I/4)*Sec[c + d*x]^3*(a^2 + I*a^2
*Tan[c + d*x]))/d
```

Rule 3486

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

Rule 3498

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

Rule 3768

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \sec^3(c+dx)(a+ia\tan(c+dx))^2\,dx = \frac{i\sec^3(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{4d} + \frac{1}{4}(5a)\int \sec^3(c+dx)(a+ia\tan$$

$$= \frac{5ia^2\sec^3(c+dx)}{12d} + \frac{i\sec^3(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{4d} + \frac{1}{4}\left(5a^2\right)\int \mathrm{s}$$

$$= \frac{5ia^2\sec^3(c+dx)}{12d} + \frac{5a^2\sec(c+dx)\tan(c+dx)}{8d} + \frac{i\sec^3(c+dx)\left(a^2+i\right.}{4d}$$

$$= \frac{5a^2\tanh^{-1}(\sin(c+dx))}{8d} + \frac{5ia^2\sec^3(c+dx)}{12d} + \frac{5a^2\sec(c+dx)\tan(c+}{8d}$$

Mathematica [B] time = 1.29, size = 215, normalized size = 2.29

$$a^2\sec^4(c+dx)\left(-18\sin(c+dx)+30\sin(3(c+dx))+128i\cos(c+dx)-45\log\left(\cos\left(\tfrac{1}{2}(c+dx)\right)-\sin\left(\tfrac{1}{2}(c+dx\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^3*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (a^2*Sec[c + d*x]^4*((128*I)*Cos[c + d*x] - 45*Log[Cos[(c + d*x)/2] - Sin[(
c + d*x)/2]] - 60*Cos[2*(c + d*x)]*(Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]
] - Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]) - 15*Cos[4*(c + d*x)]*(Log[Co
s[(c + d*x)/2] - Sin[(c + d*x)/2]] - Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2
]]) + 45*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] - 18*Sin[c + d*x] + 30*Si
n[3*(c + d*x)]))/(192*d)
```

fricas [B] time = 0.65, size = 256, normalized size = 2.72

$$\frac{-30i\,a^2e^{(7i\,dx+7i\,c)}+146i\,a^2e^{(5i\,dx+5i\,c)}+110i\,a^2e^{(3i\,dx+3i\,c)}+30i\,a^2e^{(i\,dx+i\,c)}+15\left(a^2e^{(8i\,dx+8i\,c)}+4\,a^2e^{(6i\,dx+6i\,c)}+6\,a^2\right.}{24\left(de^{(8i\,dx+8i\,c)}+4\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/24*(-30*I*a^2*e^(7*I*d*x + 7*I*c) + 146*I*a^2*e^(5*I*d*x + 5*I*c) + 110*I
*a^2*e^(3*I*d*x + 3*I*c) + 30*I*a^2*e^(I*d*x + I*c) + 15*(a^2*e^(8*I*d*x +
8*I*c) + 4*a^2*e^(6*I*d*x + 6*I*c) + 6*a^2*e^(4*I*d*x + 4*I*c) + 4*a^2*e^(2
*I*d*x + 2*I*c) + a^2)*log(e^(I*d*x + I*c) + I) - 15*(a^2*e^(8*I*d*x + 8*I*
c) + 4*a^2*e^(6*I*d*x + 6*I*c) + 6*a^2*e^(4*I*d*x + 4*I*c) + 4*a^2*e^(2*I*d
*x + 2*I*c) + a^2)*log(e^(I*d*x + I*c) - I))/(d*e^(8*I*d*x + 8*I*c) + 4*d*e
^(6*I*d*x + 6*I*c) + 6*d*e^(4*I*d*x + 4*I*c) + 4*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [B] time = 0.79, size = 173, normalized size = 1.84

$$\frac{15\,a^2\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)-15\,a^2\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)+\frac{2\left(9\,a^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7-48i\,a^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^6-33\,a^2\tan\left(\frac{1}{2}\right.\right.}{}}{24\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/24*(15*a^2*log(tan(1/2*d*x + 1/2*c) + 1) - 15*a^2*log(tan(1/2*d*x + 1/2*c
) - 1) + 2*(9*a^2*tan(1/2*d*x + 1/2*c)^7 - 48*I*a^2*tan(1/2*d*x + 1/2*c)^6
```

```
- 33*a^2*tan(1/2*d*x + 1/2*c)^5 + 48*I*a^2*tan(1/2*d*x + 1/2*c)^4 - 33*a^2*
tan(1/2*d*x + 1/2*c)^3 - 16*I*a^2*tan(1/2*d*x + 1/2*c)^2 + 9*a^2*tan(1/2*d*
x + 1/2*c) + 16*I*a^2)/(tan(1/2*d*x + 1/2*c)^2 - 1)^4)/d
```

maple [A] time = 0.44, size = 123, normalized size = 1.31

$$-\frac{a^2 \left(\sin^3(dx+c)\right)}{4d\cos(dx+c)^4}-\frac{a^2 \left(\sin^3(dx+c)\right)}{8d\cos(dx+c)^2}-\frac{a^2\sin(dx+c)}{8d}+\frac{5a^2\ln(\sec(dx+c)+\tan(dx+c))}{8d}+\frac{2ia^2}{3d\cos(dx+c)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] -1/4/d*a^2*sin(d*x+c)^3/cos(d*x+c)^4-1/8/d*a^2*sin(d*x+c)^3/cos(d*x+c)^2-1/
8*a^2*sin(d*x+c)/d+5/8/d*a^2*ln(sec(d*x+c)+tan(d*x+c))+2/3*I/d*a^2/cos(d*x+
c)^3+1/2*a^2*sec(d*x+c)*tan(d*x+c)/d
```

maxima [A] time = 0.56, size = 130, normalized size = 1.38

$$-\frac{3\,a^2\left(\frac{2\left(\sin(dx+c)^3+\sin(dx+c)\right)}{\sin(dx+c)^4-2\,\sin(dx+c)^2+1}-\log(\sin(dx+c)+1)+\log(\sin(dx+c)-1)\right)+12\,a^2\left(\frac{2\,\sin(dx+c)}{\sin(dx+c)^2-1}-\log(\sin(dx\right.}{48\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/48*(3*a^2*(2*(sin(d*x + c)^3 + sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(d*x
 + c)^2 + 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)) + 12*a^2*(2*s
in(d*x + c)/(sin(d*x + c)^2 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c)
 - 1)) - 32*I*a^2/cos(d*x + c)^3)/d
```

mupad [B] time = 6.78, size = 198, normalized size = 2.11

$$\frac{5\,a^2\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{4\,d}-\frac{-\frac{3\,a^2\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{4}+a^2\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6\,4\mathrm{i}+\frac{11\,a^2\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{4}-a^2\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4\,4\mathrm{i}+\frac{11\,a^2}{}}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8-4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6+6\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^2/cos(c + d*x)^3,x)
```

```
[Out] (5*a^2*atanh(tan(c/2 + (d*x)/2)))/(4*d) - ((a^2*tan(c/2 + (d*x)/2)^2*4i)/3
+ (11*a^2*tan(c/2 + (d*x)/2)^3)/4 - a^2*tan(c/2 + (d*x)/2)^4*4i + (11*a^2*t
an(c/2 + (d*x)/2)^5)/4 + a^2*tan(c/2 + (d*x)/2)^6*4i - (3*a^2*tan(c/2 + (d*
x)/2)^7)/4 - (a^2*4i)/3 - (3*a^2*tan(c/2 + (d*x)/2))/4)/(d*(6*tan(c/2 + (d*
x)/2)^4 - 4*tan(c/2 + (d*x)/2)^2 - 4*tan(c/2 + (d*x)/2)^6 + tan(c/2 + (d*x)
/2)^8 + 1))
```

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

$$-a^2\left(\int\tan^2(c+dx)\sec^3(c+dx)\,dx+\int\left(-2i\tan(c+dx)\sec^3(c+dx)\right)\,dx+\int\left(-\sec^3(c+dx)\right)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3*(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -a**2*(Integral(tan(c + d*x)**2*sec(c + d*x)**3, x) + Integral(-2*I*tan(c +
 d*x)*sec(c + d*x)**3, x) + Integral(-sec(c + d*x)**3, x))
```

3.30 $\int \sec(c+dx)(a+ia\tan(c+dx))^2\,dx$

Optimal. Leaf size=68

$$\frac{3ia^2\sec(c+dx)}{2d}+\frac{3a^2\tanh^{-1}(\sin(c+dx))}{2d}+\frac{i\sec(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{2d}$$

```
[Out] 3/2*a^2*arctanh(sin(d*x+c))/d+3/2*I*a^2*sec(d*x+c)/d+1/2*I*sec(d*x+c)*(a^2+
I*a^2*tan(d*x+c))/d
```

Rubi [A] time = 0.04, antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {3498, 3486, 3770}

$$\frac{3ia^2\sec(c+dx)}{2d}+\frac{3a^2\tanh^{-1}(\sin(c+dx))}{2d}+\frac{i\sec(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (3*a^2*ArcTanh[Sin[c + d*x]])/(2*d) + (((3*I)/2)*a^2*Sec[c + d*x])/d + ((I/
2)*Sec[c + d*x]*(a^2 + I*a^2*Tan[c + d*x]))/d
```

Rule 3486

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

Rule 3498

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\int \sec(c+dx)(a+ia\tan(c+dx))^2\,dx &= \frac{i\sec(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{2d}+\frac{1}{2}(3a)\int \sec(c+dx)(a+ia\tan(c+\\ &= \frac{3ia^2\sec(c+dx)}{2d}+\frac{i\sec(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{2d}+\frac{1}{2}\left(3a^2\right)\int \sec(\\ &= \frac{3a^2\tanh^{-1}(\sin(c+dx))}{2d}+\frac{3ia^2\sec(c+dx)}{2d}+\frac{i\sec(c+dx)\left(a^2+ia^2\tan\right.}{2d}\end{aligned}$$

Mathematica [B] time = 0.95, size = 146, normalized size = 2.15

$$-\frac{a^2\sec^2(c+dx)\left(2\sin(c+dx)-8i\cos(c+dx)+3\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)+3\cos(2(c+dx))\left(\text{lo}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] -1/4*(a^2*Sec[c + d*x]^2*((-8*I)*Cos[c + d*x] + 3*Log[Cos[(c + d*x)/2] - Si
n[(c + d*x)/2]] + 3*Cos[2*(c + d*x)]*(Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/
2]] - Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]) - 3*Log[Cos[(c + d*x)/2] +
Sin[(c + d*x)/2]] + 2*Sin[c + d*x]))/d
```

fricas [B] time = 0.44, size = 148, normalized size = 2.18

$$\frac{10i\,a^2e^{(3i\,dx+3i\,c)}+6i\,a^2e^{(i\,dx+i\,c)}+3\left(a^2e^{(4i\,dx+4i\,c)}+2\,a^2e^{(2i\,dx+2i\,c)}+a^2\right)\log\left(e^{(i\,dx+i\,c)}+i\right)-3\left(a^2e^{(4i\,dx+4i\,c)}+2\,a\right.}{2\left(de^{(4i\,dx+4i\,c)}+2\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/2*(10*I*a^2*e^(3*I*d*x + 3*I*c) + 6*I*a^2*e^(I*d*x + I*c) + 3*(a^2*e^(4*I
*d*x + 4*I*c) + 2*a^2*e^(2*I*d*x + 2*I*c) + a^2)*log(e^(I*d*x + I*c) + I) -
 3*(a^2*e^(4*I*d*x + 4*I*c) + 2*a^2*e^(2*I*d*x + 2*I*c) + a^2)*log(e^(I*d*x
 + I*c) - I))/(d*e^(4*I*d*x + 4*I*c) + 2*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [A] time = 0.77, size = 107, normalized size = 1.57

$$\frac{3\,a^2\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)-3\,a^2\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)-\frac{2\left(a^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+4i\,a^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+a^2\tan\left(\frac{1}{2}\,dx+\right.\right.}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)^2}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/2*(3*a^2*log(tan(1/2*d*x + 1/2*c) + 1) - 3*a^2*log(tan(1/2*d*x + 1/2*c) -
 1) - 2*(a^2*tan(1/2*d*x + 1/2*c)^3 + 4*I*a^2*tan(1/2*d*x + 1/2*c)^2 + a^2*
tan(1/2*d*x + 1/2*c) - 4*I*a^2)/(tan(1/2*d*x + 1/2*c)^2 - 1)^2)/d
```

maple [A] time = 0.14, size = 79, normalized size = 1.16

$$-\frac{a^2\left(\sin^3\left(dx+c\right)\right)}{2d\cos\left(dx+c\right)^2}-\frac{a^2\sin\left(dx+c\right)}{2d}+\frac{3a^2\ln\left(\sec\left(dx+c\right)+\tan\left(dx+c\right)\right)}{2d}+\frac{2ia^2}{d\cos\left(dx+c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)*(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] -1/2/d*a^2*sin(d*x+c)^3/cos(d*x+c)^2-1/2*a^2*sin(d*x+c)/d+3/2/d*a^2*ln(sec(
d*x+c)+tan(d*x+c))+2*I/d*a^2/cos(d*x+c)
```

maxima [A] time = 0.46, size = 83, normalized size = 1.22

$$\frac{a^2\left(\frac{2\,\sin(dx+c)}{\sin(dx+c)^2-1}+\log\left(\sin\left(dx+c\right)+1\right)-\log\left(\sin\left(dx+c\right)-1\right)\right)+4\,a^2\log\left(\sec\left(dx+c\right)+\tan\left(dx+c\right)\right)+\frac{8i\,a^2}{\cos(dx\cdot}}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/4*(a^2*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) + log(sin(d*x + c) + 1) - log
(sin(d*x + c) - 1)) + 4*a^2*log(sec(d*x + c) + tan(d*x + c)) + 8*I*a^2/cos(
d*x + c))/d
```

mupad [B] time = 3.82, size = 104, normalized size = 1.53

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^2/cos(c + d*x),x)
```

```
[Out] (3*a^2*atanh(tan(c/2 + (d*x)/2)))/d - (a^2*tan(c/2 + (d*x)/2)^2*4i + a^2*ta
n(c/2 + (d*x)/2)^3 - a^2*4i + a^2*tan(c/2 + (d*x)/2))/(d*(tan(c/2 + (d*x)/2
)^4 - 2*tan(c/2 + (d*x)/2)^2 + 1))
```

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

$$-a^2\left(\int \tan^2(c+dx)\sec(c+dx)\,dx+\int(-2i\tan(c+dx)\sec(c+dx))\,dx+\int(-\sec(c+dx))\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -a**2*(Integral(tan(c + d*x)**2*sec(c + d*x), x) + Integral(-2*I*tan(c + d*
x)*sec(c + d*x), x) + Integral(-sec(c + d*x), x))
```

3.31 $\int \cos(c+dx)(a+ia\tan(c+dx))^2\,dx$

Optimal. Leaf size=46

$$-\frac{a^2\tanh^{-1}(\sin(c+dx))}{d}-\frac{2i\cos(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{d}$$

```
[Out] -a^2*arctanh(sin(d*x+c))/d-2*I*cos(d*x+c)*(a^2+I*a^2*tan(d*x+c))/d
```

Rubi [A] time = 0.03, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {3496, 3770}

$$-\frac{a^2\tanh^{-1}(\sin(c+dx))}{d}-\frac{2i\cos(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] -((a^2*ArcTanh[Sin[c + d*x]])/d) - ((2*I)*Cos[c + d*x]*(a^2 + I*a^2*Tan[c +
 d*x]))/d
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\int \cos(c+dx)(a+ia\tan(c+dx))^2\,dx &= -\frac{2i\cos(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{d}-a^2\int \sec(c+dx)\,dx\\ &= -\frac{a^2\tanh^{-1}(\sin(c+dx))}{d}-\frac{2i\cos(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{d}\end{aligned}$$

Mathematica [B] time = 0.27, size = 180, normalized size = 3.91

$$\frac{a^2\left(\cos\left(\frac{1}{2}(c+5dx)\right)+i\sin\left(\frac{1}{2}(c+5dx)\right)\right)\left(\cos\left(\frac{1}{2}(c+dx)\right)\left(\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)-\log\left(\sin\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (a^2*(Cos[(c + d*x)/2]*(-2*I + Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - L
og[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]) + (2 - I*Log[Cos[(c + d*x)/2] - Si
```

```
n[(c + d*x)/2]] + I*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]])*Sin[(c + d*x)
/2])*(Cos[(c + 5*d*x)/2] + I*Sin[(c + 5*d*x)/2]))/(d*(Cos[d*x] + I*Sin[d*x]
)^2)
```

fricas [A] time = 0.53, size = 52, normalized size = 1.13

$$\frac{-2i\,a^2e^{(i\,dx+i\,c)} - a^2\log\left(e^{(i\,dx+i\,c)} + i\right) + a^2\log\left(e^{(i\,dx+i\,c)} - i\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] (-2*I*a^2*e^(I*d*x + I*c) - a^2*log(e^(I*d*x + I*c) + I) + a^2*log(e^(I*d*x
 + I*c) - I))/d
```

giac [A] time = 1.19, size = 56, normalized size = 1.22

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

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

maple [A] time = 0.30, size = 53, normalized size = 1.15

$$-\frac{2ia^2\cos\left(dx+c\right)}{d} + \frac{2a^2\sin\left(dx+c\right)}{d} - \frac{a^2\ln\left(\sec\left(dx+c\right)+\tan\left(dx+c\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)*(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] -2*I/d*a^2*cos(d*x+c)+2*a^2*sin(d*x+c)/d-1/d*a^2*ln(sec(d*x+c)+tan(d*x+c))
```

maxima [A] time = 0.37, size = 61, normalized size = 1.33

$$-\frac{a^2\left(\log\left(\sin\left(dx+c\right)+1\right) - \log\left(\sin\left(dx+c\right)-1\right) - 2\,\sin\left(dx+c\right)\right) + 4i\,a^2\cos\left(dx+c\right) - 2\,a^2\sin\left(dx+c\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

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

mupad [B] time = 3.37, size = 41, normalized size = 0.89

$$-\frac{2\,a^2\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d} + \frac{4\,a^2}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+1{}\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^2,x)
```

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

sympy [A] time = 0.29, size = 68, normalized size = 1.48

$$\frac{a^2 \left(\log\left(e^{idx} - ie^{-ic}\right) - \log\left(e^{idx} + ie^{-ic}\right)\right)}{d} + \begin{cases} -\frac{2ia^2e^{ic}e^{idx}}{d} & \text{for } d \neq 0 \\ 2a^2xe^{ic} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] a**2*(log(exp(I*d*x) - I*exp(-I*c)) - log(exp(I*d*x) + I*exp(-I*c)))/d + Pi
ecewise((-2*I*a**2*exp(I*c)*exp(I*d*x)/d, Ne(d, 0)), (2*a**2*x*exp(I*c), Tr
ue))
```

3.32 $\int \cos^3(c+dx)(a+ia\tan(c+dx))^2\,dx$

Optimal. Leaf size=51

$$\frac{a^2\sin(c+dx)}{3d}-\frac{2i\cos^3(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{3d}$$

```
[Out] 1/3*a^2*sin(d*x+c)/d-2/3*I*cos(d*x+c)^3*(a^2+I*a^2*tan(d*x+c))/d
```

Rubi [A] time = 0.04, antiderivative size = 51, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3496, 2637}

$$\frac{a^2\sin(c+dx)}{3d}-\frac{2i\cos^3(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (a^2*Sin[c + d*x])/(3*d) - (((2*I)/3)*Cos[c + d*x]^3*(a^2 + I*a^2*Tan[c + d
*x]))/d
```

Rule 2637

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rubi steps

$$\begin{aligned}\int \cos^3(c+dx)(a+ia\tan(c+dx))^2\,dx &= -\frac{2i\cos^3(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{3d}+\frac{1}{3}a^2\int \cos(c+dx)\,dx\\ &= \frac{a^2\sin(c+dx)}{3d}-\frac{2i\cos^3(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{3d}\end{aligned}$$

Mathematica [A] time = 0.25, size = 50, normalized size = 0.98

$$\frac{a^2(2\cos(c+dx)-i\sin(c+dx))(\sin(2(c+dx))-i\cos(2(c+dx)))}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (a^2*(2*Cos[c + d*x] - I*Sin[c + d*x])*((-I)*Cos[2*(c + d*x)] + Sin[2*(c +
d*x)]))/(3*d)
```

fricas [A] time = 0.48, size = 34, normalized size = 0.67

$$\frac{-i\,a^2e^{(3i\,dx+3i\,c)} - 3i\,a^2e^{(i\,dx+i\,c)}}{6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/6*(-I*a^2*e^(3*I*d*x + 3*I*c) - 3*I*a^2*e^(I*d*x + I*c))/d
```

giac [B] time = 1.19, size = 531, normalized size = 10.41

$$-\frac{24\,a^2e^{(4i\,dx+2i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}+1\right)+48\,a^2e^{(2i\,dx)}\log\left(i\,e^{(i\,dx+i\,c)}+1\right)+24\,a^2e^{(-2i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}+1\right)+27\,a^2e^{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -1/96*(24*a^2*e^(4*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) + 1) + 48*a^2*e^(2*
I*d*x)*log(I*e^(I*d*x + I*c) + 1) + 24*a^2*e^(-2*I*c)*log(I*e^(I*d*x + I*c)
 + 1) + 27*a^2*e^(4*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) - 1) + 54*a^2*e^(2
*I*d*x)*log(I*e^(I*d*x + I*c) - 1) + 27*a^2*e^(-2*I*c)*log(I*e^(I*d*x + I*c
) - 1) - 24*a^2*e^(4*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 48*a^2*e^
(2*I*d*x)*log(-I*e^(I*d*x + I*c) + 1) - 24*a^2*e^(-2*I*c)*log(-I*e^(I*d*x +
 I*c) + 1) - 27*a^2*e^(4*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 54*a^
2*e^(2*I*d*x)*log(-I*e^(I*d*x + I*c) - 1) - 27*a^2*e^(-2*I*c)*log(-I*e^(I*d
*x + I*c) - 1) + 3*a^2*e^(4*I*d*x + 2*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 6*
a^2*e^(2*I*d*x)*log(I*e^(I*d*x) + e^(-I*c)) + 3*a^2*e^(-2*I*c)*log(I*e^(I*d
*x) + e^(-I*c)) - 3*a^2*e^(4*I*d*x + 2*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) -
6*a^2*e^(2*I*d*x)*log(-I*e^(I*d*x) + e^(-I*c)) - 3*a^2*e^(-2*I*c)*log(-I*e^
(I*d*x) + e^(-I*c)) + 16*I*a^2*e^(7*I*d*x + 5*I*c) + 80*I*a^2*e^(5*I*d*x +
3*I*c) + 112*I*a^2*e^(3*I*d*x + I*c) + 48*I*a^2*e^(I*d*x - I*c))/(d*e^(4*I*
d*x + 2*I*c) + 2*d*e^(2*I*d*x) + d*e^(-2*I*c))
```

maple [A] time = 0.44, size = 54, normalized size = 1.06

$$\frac{-\frac{a^2\left(\sin^3(dx+c)\right)}{3}-\frac{2ia^2\left(\cos^3(dx+c)\right)}{3}+\frac{a^2\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(-1/3*a^2*sin(d*x+c)^3-2/3*I*a^2*cos(d*x+c)^3+1/3*a^2*(2+cos(d*x+c)^2)*
sin(d*x+c))
```

maxima [A] time = 0.32, size = 52, normalized size = 1.02

$$-\frac{2i\,a^2\cos\left(dx+c\right)^3+a^2\sin\left(dx+c\right)^3+\left(\sin\left(dx+c\right)^3-3\,\sin\left(dx+c\right)\right)a^2}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/3*(2*I*a^2*cos(d*x + c)^3 + a^2*sin(d*x + c)^3 + (sin(d*x + c)^3 - 3*sin
(d*x + c))*a^2)/d
```

mupad [B] time = 3.36, size = 78, normalized size = 1.53

$$-\frac{2\,a^2\,\left(3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,3{}\mathrm{i}-2\right)}{3\,d\,\left(-{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^3-{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^2\,3{}\mathrm{i}+3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+1{}\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^2,x)
```

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

sympy [A] time = 0.27, size = 76, normalized size = 1.49

$$\begin{cases} \frac{-2ia^2de^{3ic}e^{3idx}-6ia^2de^{ic}e^{idx}}{12d^2} & \text{for}\ 12d^2 \neq 0 \\ x\left(\frac{a^2e^{3ic}}{2}+\frac{a^2e^{ic}}{2}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3*(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Piecewise(((-2*I*a**2*d*exp(3*I*c)*exp(3*I*d*x) - 6*I*a**2*d*exp(I*c)*exp(I
*d*x))/(12*d**2), Ne(12*d**2, 0)), (x*(a**2*exp(3*I*c)/2 + a**2*exp(I*c)/2)
, True))
```

3.33 $\int \cos^5(c+dx)(a+ia\tan(c+dx))^2\,dx$

Optimal. Leaf size=69

$$-\frac{a^2\sin^3(c+dx)}{5d}+\frac{3a^2\sin(c+dx)}{5d}-\frac{2i\cos^5(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{5d}$$

```
[Out] 3/5*a^2*sin(d*x+c)/d-1/5*a^2*sin(d*x+c)^3/d-2/5*I*cos(d*x+c)^5*(a^2+I*a^2*t
an(d*x+c))/d
```

Rubi [A] time = 0.05, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3496, 2633}

$$-\frac{a^2\sin^3(c+dx)}{5d}+\frac{3a^2\sin(c+dx)}{5d}-\frac{2i\cos^5(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{5d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (3*a^2*Sin[c + d*x])/(5*d) - (a^2*Sin[c + d*x]^3)/(5*d) - (((2*I)/5)*Cos[c
+ d*x]^5*(a^2 + I*a^2*Tan[c + d*x]))/d
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rubi steps

$$\int \cos^5(c+dx)(a+ia\tan(c+dx))^2\,dx=-\frac{2i\cos^5(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{5d}+\frac{1}{5}\left(3a^2\right)\int \cos^3(c+dx)\,dx$$

$$=-\frac{2i\cos^5(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{5d}-\frac{\left(3a^2\right)\operatorname{Subst}\left(\int\left(1-x^2\right)\,d\right.}{5d}$$

$$=\frac{3a^2\sin(c+dx)}{5d}-\frac{a^2\sin^3(c+dx)}{5d}-\frac{2i\cos^5(c+dx)\left(a^2+ia^2\tan(c+\right.}{5d}$$

Mathematica [A] time = 0.52, size = 72, normalized size = 1.04

$$\frac{a^2(\sin(2(c+dx))-i\cos(2(c+dx)))(-5i\sin(c+dx)+3i\sin(3(c+dx))+10\cos(c+dx)-2\cos(3(c+dx)))}{20d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (a^2*((-I)*Cos[2*(c + d*x)] + Sin[2*(c + d*x)])*(10*Cos[c + d*x] - 2*Cos[3*
(c + d*x)] - (5*I)*Sin[c + d*x] + (3*I)*Sin[3*(c + d*x)]))/(20*d)
```

fricas [A] time = 0.58, size = 62, normalized size = 0.90

$$\frac{\left(-i\,a^2e^{(6i\,dx+6i\,c)}-5i\,a^2e^{(4i\,dx+4i\,c)}-15i\,a^2e^{(2i\,dx+2i\,c)}+5i\,a^2\right)e^{(-i\,dx-i\,c)}}{40\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/40*(-I*a^2*e^(6*I*d*x + 6*I*c) - 5*I*a^2*e^(4*I*d*x + 4*I*c) - 15*I*a^2*e
^(2*I*d*x + 2*I*c) + 5*I*a^2)*e^(-I*d*x - I*c)/d
```

giac [B] time = 2.02, size = 613, normalized size = 8.88

$$-\frac{45\,a^2e^{(5i\,dx+3i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}+1\right)+90\,a^2e^{(3i\,dx+i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}+1\right)+45\,a^2e^{(i\,dx-i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}+1\right)+40\,a^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -1/160*(45*a^2*e^(5*I*d*x + 3*I*c)*log(I*e^(I*d*x + I*c) + 1) + 90*a^2*e^(3
*I*d*x + I*c)*log(I*e^(I*d*x + I*c) + 1) + 45*a^2*e^(I*d*x - I*c)*log(I*e^(
I*d*x + I*c) + 1) + 40*a^2*e^(5*I*d*x + 3*I*c)*log(I*e^(I*d*x + I*c) - 1) +
 80*a^2*e^(3*I*d*x + I*c)*log(I*e^(I*d*x + I*c) - 1) + 40*a^2*e^(I*d*x - I*
c)*log(I*e^(I*d*x + I*c) - 1) - 45*a^2*e^(5*I*d*x + 3*I*c)*log(-I*e^(I*d*x
+ I*c) + 1) - 90*a^2*e^(3*I*d*x + I*c)*log(-I*e^(I*d*x + I*c) + 1) - 45*a^2
*e^(I*d*x - I*c)*log(-I*e^(I*d*x + I*c) + 1) - 40*a^2*e^(5*I*d*x + 3*I*c)*l
og(-I*e^(I*d*x + I*c) - 1) - 80*a^2*e^(3*I*d*x + I*c)*log(-I*e^(I*d*x + I*c
) - 1) - 40*a^2*e^(I*d*x - I*c)*log(-I*e^(I*d*x + I*c) - 1) - 5*a^2*e^(5*I*
d*x + 3*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 10*a^2*e^(3*I*d*x + I*c)*log(I*e
^(I*d*x) + e^(-I*c)) - 5*a^2*e^(I*d*x - I*c)*log(I*e^(I*d*x) + e^(-I*c)) +
5*a^2*e^(5*I*d*x + 3*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 10*a^2*e^(3*I*d*x
+ I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 5*a^2*e^(I*d*x - I*c)*log(-I*e^(I*d*x
) + e^(-I*c)) + 4*I*a^2*e^(10*I*d*x + 8*I*c) + 28*I*a^2*e^(8*I*d*x + 6*I*c)
 + 104*I*a^2*e^(6*I*d*x + 4*I*c) + 120*I*a^2*e^(4*I*d*x + 2*I*c) + 20*I*a^2
*e^(2*I*d*x) - 20*I*a^2*e^(-2*I*c))/(d*e^(5*I*d*x + 3*I*c) + 2*d*e^(3*I*d*x
 + I*c) + d*e^(I*d*x - I*c))
```

maple [A] time = 0.52, size = 91, normalized size = 1.32

$$\frac{-a^2\left(-\frac{\sin(dx+c)\left(\cos^4(dx+c)\right)}{5}+\frac{\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{15}\right)-\frac{2ia^2\left(\cos^5(dx+c)\right)}{5}+\frac{a^2\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(-a^2*(-1/5*sin(d*x+c)*cos(d*x+c)^4+1/15*(2+cos(d*x+c)^2)*sin(d*x+c))-2
/5*I*a^2*cos(d*x+c)^5+1/5*a^2*(8/3+cos(d*x+c)^4+4/3*cos(d*x+c)^2)*sin(d*x+c
))
```

maxima [A] time = 0.44, size = 79, normalized size = 1.14

$$-\frac{6i\,a^2\cos\left(dx+c\right)^5-\left(3\,\sin\left(dx+c\right)^5-5\,\sin\left(dx+c\right)^3\right)a^2-\left(3\,\sin\left(dx+c\right)^5-10\,\sin\left(dx+c\right)^3+15\,\sin\left(dx+c\right)\right.}{15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/15*(6*I*a^2*cos(d*x + c)^5 - (3*sin(d*x + c)^5 - 5*sin(d*x + c)^3)*a^2 -
 (3*sin(d*x + c)^5 - 10*sin(d*x + c)^3 + 15*sin(d*x + c))*a^2)/d
```

mupad [B] time = 4.17, size = 71, normalized size = 1.03

$$\frac{2\,a^2\,\left(\frac{5\,\sin\left(3\,c+3\,d\,x\right)}{16}-\frac{\cos\left(5\,c+5\,d\,x\right)\,1{}\mathrm{i}}{16}-\frac{\cos\left(3\,c+3\,d\,x\right)\,5{}\mathrm{i}}{16}+\frac{\sin\left(5\,c+5\,d\,x\right)}{16}+\frac{5\,\sqrt{3}\,\sin\left(c+d\,x-\frac{\ln\left(3\right)\,1{}\mathrm{i}}{2}\right)}{8}\right)}{5\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] (2*a^2*((5*sin(3*c + 3*d*x))/16 - (cos(5*c + 5*d*x)*1i)/16 - (cos(3*c + 3*d
*x)*5i)/16 + sin(5*c + 5*d*x)/16 + (5*3^(1/2)*sin(c - (log(3)*1i)/2 + d*x))
/8))/(5*d)
```

sympy [A] time = 0.42, size = 155, normalized size = 2.25

$$\begin{cases} \frac{\left(-512ia^2d^3e^{6ic}e^{5idx}-2560ia^2d^3e^{4ic}e^{3idx}-7680ia^2d^3e^{2ic}e^{idx}+2560ia^2d^3e^{-idx}\right)e^{-ic}}{20480d^4} & \text{for } 20480d^4e^{ic}\neq 0 \\ \frac{x\left(a^2e^{6ic}+3a^2e^{4ic}+3a^2e^{2ic}+a^2\right)e^{-ic}}{8} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**5*(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Piecewise(((-512*I*a**2*d**3*exp(6*I*c)*exp(5*I*d*x) - 2560*I*a**2*d**3*exp
(4*I*c)*exp(3*I*d*x) - 7680*I*a**2*d**3*exp(2*I*c)*exp(I*d*x) + 2560*I*a**2
*d**3*exp(-I*d*x))*exp(-I*c)/(20480*d**4), Ne(20480*d**4*exp(I*c), 0)), (x*
(a**2*exp(6*I*c) + 3*a**2*exp(4*I*c) + 3*a**2*exp(2*I*c) + a**2)*exp(-I*c)/
8, True))
```

3.34 $\int \cos^7(c+dx)(a+ia\tan(c+dx))^2\,dx$

Optimal. Leaf size=87

$$\frac{a^2\sin^5(c+dx)}{7d}-\frac{10a^2\sin^3(c+dx)}{21d}+\frac{5a^2\sin(c+dx)}{7d}-\frac{2i\cos^7(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{7d}$$

```
[Out] 5/7*a^2*sin(d*x+c)/d-10/21*a^2*sin(d*x+c)^3/d+1/7*a^2*sin(d*x+c)^5/d-2/7*I*
cos(d*x+c)^7*(a^2+I*a^2*tan(d*x+c))/d
```

Rubi [A] time = 0.05, antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3496, 2633}

$$\frac{a^2\sin^5(c+dx)}{7d}-\frac{10a^2\sin^3(c+dx)}{21d}+\frac{5a^2\sin(c+dx)}{7d}-\frac{2i\cos^7(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{7d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^7*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (5*a^2*Sin[c + d*x])/(7*d) - (10*a^2*Sin[c + d*x]^3)/(21*d) + (a^2*Sin[c +
d*x]^5)/(7*d) - (((2*I)/7)*Cos[c + d*x]^7*(a^2 + I*a^2*Tan[c + d*x]))/d
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rubi steps

$$\begin{aligned}\int \cos^7(c+dx)(a+ia\tan(c+dx))^2\,dx &= -\frac{2i\cos^7(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{7d}+\frac{1}{7}\left(5a^2\right)\int \cos^5(c+dx)\,dx\\ &= -\frac{2i\cos^7(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{7d}-\frac{\left(5a^2\right)\operatorname{Subst}\left(\int\left(1-2x^2+x^4\right.\right.}{7d}\\ &= \frac{5a^2\sin(c+dx)}{7d}-\frac{10a^2\sin^3(c+dx)}{21d}+\frac{a^2\sin^5(c+dx)}{7d}-\frac{2i\cos^7(c+dx}{}\end{aligned}$$

Mathematica [A] time = 0.50, size = 111, normalized size = 1.28

$$\frac{a^2(-70\sin(c+dx)+63\sin(3(c+dx))+5\sin(5(c+dx))-140i\cos(c+dx)+42i\cos(3(c+dx))+2i\cos(5(c+}{336d(\cos(dx)+i\sin(dx))^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^7*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (a^2*((-140*I)*Cos[c + d*x] + (42*I)*Cos[3*(c + d*x)] + (2*I)*Cos[5*(c + d*
x)] - 70*Sin[c + d*x] + 63*Sin[3*(c + d*x)] + 5*Sin[5*(c + d*x)])*(Cos[2*(c
 + 2*d*x)] + I*Sin[2*(c + 2*d*x)]))/(336*d*(Cos[d*x] + I*Sin[d*x])^2)
```

fricas [A] time = 0.69, size = 90, normalized size = 1.03

$$\frac{\left(-3i\,a^2e^{(10i\,dx+10i\,c)} - 21i\,a^2e^{(8i\,dx+8i\,c)} - 70i\,a^2e^{(6i\,dx+6i\,c)} - 210i\,a^2e^{(4i\,dx+4i\,c)} + 105i\,a^2e^{(2i\,dx+2i\,c)} + 7i\,a^2\right)e^{(-3i\,dx-3i}}{672\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/672*(-3*I*a^2*e^(10*I*d*x + 10*I*c) - 21*I*a^2*e^(8*I*d*x + 8*I*c) - 70*I
*a^2*e^(6*I*d*x + 6*I*c) - 210*I*a^2*e^(4*I*d*x + 4*I*c) + 105*I*a^2*e^(2*I
*d*x + 2*I*c) + 7*I*a^2)*e^(-3*I*d*x - 3*I*c)/d
```

giac [B] time = 2.86, size = 641, normalized size = 7.37

$$-\frac{2583\,a^2e^{(7i\,dx+3i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}+1\right) + 5166\,a^2e^{(5i\,dx+i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}+1\right) + 2583\,a^2e^{(3i\,dx-i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -1/10752*(2583*a^2*e^(7*I*d*x + 3*I*c)*log(I*e^(I*d*x + I*c) + 1) + 5166*a^
2*e^(5*I*d*x + I*c)*log(I*e^(I*d*x + I*c) + 1) + 2583*a^2*e^(3*I*d*x - I*c)
*log(I*e^(I*d*x + I*c) + 1) + 2121*a^2*e^(7*I*d*x + 3*I*c)*log(I*e^(I*d*x +
 I*c) - 1) + 4242*a^2*e^(5*I*d*x + I*c)*log(I*e^(I*d*x + I*c) - 1) + 2121*a
^2*e^(3*I*d*x - I*c)*log(I*e^(I*d*x + I*c) - 1) - 2583*a^2*e^(7*I*d*x + 3*I
*c)*log(-I*e^(I*d*x + I*c) + 1) - 5166*a^2*e^(5*I*d*x + I*c)*log(-I*e^(I*d*
x + I*c) + 1) - 2583*a^2*e^(3*I*d*x - I*c)*log(-I*e^(I*d*x + I*c) + 1) - 21
21*a^2*e^(7*I*d*x + 3*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 4242*a^2*e^(5*I*d*
x + I*c)*log(-I*e^(I*d*x + I*c) - 1) - 2121*a^2*e^(3*I*d*x - I*c)*log(-I*e^
(I*d*x + I*c) - 1) - 462*a^2*e^(7*I*d*x + 3*I*c)*log(I*e^(I*d*x) + e^(-I*c)
) - 924*a^2*e^(5*I*d*x + I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 462*a^2*e^(3*I*
d*x - I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 462*a^2*e^(7*I*d*x + 3*I*c)*log(-I
*e^(I*d*x) + e^(-I*c)) + 924*a^2*e^(5*I*d*x + I*c)*log(-I*e^(I*d*x) + e^(-I
*c)) + 462*a^2*e^(3*I*d*x - I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 48*I*a^2*e^
(14*I*d*x + 10*I*c) + 432*I*a^2*e^(12*I*d*x + 8*I*c) + 1840*I*a^2*e^(10*I*d
*x + 6*I*c) + 5936*I*a^2*e^(8*I*d*x + 4*I*c) + 6160*I*a^2*e^(6*I*d*x + 2*I*
c) - 1904*I*a^2*e^(2*I*d*x - 2*I*c) - 112*I*a^2*e^(4*I*d*x) - 112*I*a^2*e^(
-4*I*c))/(d*e^(7*I*d*x + 3*I*c) + 2*d*e^(5*I*d*x + I*c) + d*e^(3*I*d*x - I*
c))
```

maple [A] time = 0.53, size = 111, normalized size = 1.28

$$\frac{-a^2\left(-\frac{\sin(dx+c)\left(\cos^6(dx+c)\right)}{7}+\frac{\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{35}\right)-\frac{2ia^2\left(\cos^7(dx+c)\right)}{7}+\frac{a^2\left(\frac{16}{5}+\cos^6(dx+c)+\frac{6\left(\cos^4(dx+c)\right)}{5}+\frac{8\left(\cos^2(\right.}{5}\right.}{7}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(-a^2*(-1/7*sin(d*x+c)*cos(d*x+c)^6+1/35*(8/3+cos(d*x+c)^4+4/3*cos(d*x+
c)^2)*sin(d*x+c))-2/7*I*a^2*cos(d*x+c)^7+1/7*a^2*(16/5+cos(d*x+c)^6+6/5*cos
(d*x+c)^4+8/5*cos(d*x+c)^2)*sin(d*x+c))
```

maxima [A] time = 0.43, size = 98, normalized size = 1.13

$$-\frac{30i\,a^2\cos\left(dx+c\right)^7+\left(15\,\sin\left(dx+c\right)^7-42\,\sin\left(dx+c\right)^5+35\,\sin\left(dx+c\right)^3\right)a^2+3\left(5\,\sin\left(dx+c\right)^7-21\,\sin\left(d\right.\right.}{105\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/105*(30*I*a^2*cos(d*x + c)^7 + (15*sin(d*x + c)^7 - 42*sin(d*x + c)^5 +
35*sin(d*x + c)^3)*a^2 + 3*(5*sin(d*x + c)^7 - 21*sin(d*x + c)^5 + 35*sin(d
*x + c)^3 - 35*sin(d*x + c))*a^2)/d
```

mupad [B] time = 3.66, size = 256, normalized size = 2.94

$$\frac{2\,a^2\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)-2\mathrm{i}\right)}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)}+\frac{256\,a^2\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)-\mathrm{i}\right)}{7\,d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)^7}-\frac{8\,a^2\left(4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)-9\mathrm{i}\right)}{3\,d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)^2}-\frac{128\,a^2\left(6\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)-7\mathrm{i}\right)}{7\,d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)^6}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^7*(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] (2*a^2*(tan(c/2 + (d*x)/2) - 2i))/(d*(tan(c/2 + (d*x)/2)^2 + 1)) + (256*a^2
*(tan(c/2 + (d*x)/2) - 1i))/(7*d*(tan(c/2 + (d*x)/2)^2 + 1)^7) - (8*a^2*(4*
tan(c/2 + (d*x)/2) - 9i))/(3*d*(tan(c/2 + (d*x)/2)^2 + 1)^2) - (128*a^2*(6*
tan(c/2 + (d*x)/2) - 7i))/(7*d*(tan(c/2 + (d*x)/2)^2 + 1)^6) + (16*a^2*(8*t
an(c/2 + (d*x)/2) - 15i))/(3*d*(tan(c/2 + (d*x)/2)^2 + 1)^3) - (32*a^2*(22*
tan(c/2 + (d*x)/2) - 35i))/(7*d*(tan(c/2 + (d*x)/2)^2 + 1)^4) + (32*a^2*(31
*tan(c/2 + (d*x)/2) - 42i))/(7*d*(tan(c/2 + (d*x)/2)^2 + 1)^5)
```

sympy [A] time = 0.60, size = 240, normalized size = 2.76

$$\begin{cases}\frac{\left(-75497472ia^2d^5e^{11ic}e^{7idx}-528482304ia^2d^5e^{9ic}e^{5idx}-1761607680ia^2d^5e^{7ic}e^{3idx}-5284823040ia^2d^5e^{5ic}e^{idx}+2642411520ia^2d^5e^{3ic}e^{-idx}+176160768ia^2d\right.}{16911433728d^6} \\ \frac{x\left(a^2e^{10ic}+5a^2e^{8ic}+10a^2e^{6ic}+10a^2e^{4ic}+5a^2e^{2ic}+a^2\right)e^{-3ic}}{32}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**7*(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Piecewise(((-75497472*I*a**2*d**5*exp(11*I*c)*exp(7*I*d*x) - 528482304*I*a*
*2*d**5*exp(9*I*c)*exp(5*I*d*x) - 1761607680*I*a**2*d**5*exp(7*I*c)*exp(3*I
*d*x) - 5284823040*I*a**2*d**5*exp(5*I*c)*exp(I*d*x) + 2642411520*I*a**2*d*
*5*exp(3*I*c)*exp(-I*d*x) + 176160768*I*a**2*d**5*exp(I*c)*exp(-3*I*d*x))*e
xp(-4*I*c)/(16911433728*d**6), Ne(16911433728*d**6*exp(4*I*c), 0)), (x*(a**
2*exp(10*I*c) + 5*a**2*exp(8*I*c) + 10*a**2*exp(6*I*c) + 10*a**2*exp(4*I*c)
 + 5*a**2*exp(2*I*c) + a**2)*exp(-3*I*c)/32, True))
```

3.35 $\int \cos^9(c+dx)(a+ia\tan(c+dx))^2\,dx$

Optimal. Leaf size=105

$$-\frac{a^2\sin^7(c+dx)}{9d}+\frac{7a^2\sin^5(c+dx)}{15d}-\frac{7a^2\sin^3(c+dx)}{9d}+\frac{7a^2\sin(c+dx)}{9d}-\frac{2i\cos^9(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{9d}$$

```
[Out] 7/9*a^2*sin(d*x+c)/d-7/9*a^2*sin(d*x+c)^3/d+7/15*a^2*sin(d*x+c)^5/d-1/9*a^2
*sin(d*x+c)^7/d-2/9*I*cos(d*x+c)^9*(a^2+I*a^2*tan(d*x+c))/d
```

Rubi [A] time = 0.06, antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3496, 2633}

$$-\frac{a^2\sin^7(c+dx)}{9d}+\frac{7a^2\sin^5(c+dx)}{15d}-\frac{7a^2\sin^3(c+dx)}{9d}+\frac{7a^2\sin(c+dx)}{9d}-\frac{2i\cos^9(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{9d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^9*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (7*a^2*Sin[c + d*x])/(9*d) - (7*a^2*Sin[c + d*x]^3)/(9*d) + (7*a^2*Sin[c +
d*x]^5)/(15*d) - (a^2*Sin[c + d*x]^7)/(9*d) - (((2*I)/9)*Cos[c + d*x]^9*(a^
2 + I*a^2*Tan[c + d*x]))/d
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rubi steps

$$\begin{aligned}\int \cos^9(c+dx)(a+ia\tan(c+dx))^2\,dx &= -\frac{2i\cos^9(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{9d}+\frac{1}{9}\left(7a^2\right)\int \cos^7(c+dx)\,dx\\ &= -\frac{2i\cos^9(c+dx)\left(a^2+ia^2\tan(c+dx)\right)}{9d}-\frac{\left(7a^2\right)\text{Subst}\left(\int \left(1-3x^2+\right.\right.}{}\\ &= \frac{7a^2\sin(c+dx)}{9d}-\frac{7a^2\sin^3(c+dx)}{9d}+\frac{7a^2\sin^5(c+dx)}{15d}-\frac{a^2\sin^7(c+}{9d}\end{aligned}$$

Mathematica [A] time = 1.36, size = 133, normalized size = 1.27

$$\frac{a^2(-525\sin(c+dx)+567\sin(3(c+dx))+75\sin(5(c+dx))+7\sin(7(c+dx))-1050i\cos(c+dx)+378i\cos}{2880d(\cos(dx)+i\sin(d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^9*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (a^2*((-1050*I)*Cos[c + d*x] + (378*I)*Cos[3*(c + d*x)] + (30*I)*Cos[5*(c +
 d*x)] + (2*I)*Cos[7*(c + d*x)] - 525*Sin[c + d*x] + 567*Sin[3*(c + d*x)] +
 75*Sin[5*(c + d*x)] + 7*Sin[7*(c + d*x)])*(Cos[2*(c + 2*d*x)] + I*Sin[2*(c
 + 2*d*x)]))/(2880*d*(Cos[d*x] + I*Sin[d*x])^2)
```

fricas [A] time = 0.60, size = 118, normalized size = 1.12

$$\frac{\left(-5i\,a^2e^{(14i\,dx+14i\,c)}-45i\,a^2e^{(12i\,dx+12i\,c)}-189i\,a^2e^{(10i\,dx+10i\,c)}-525i\,a^2e^{(8i\,dx+8i\,c)}-1575i\,a^2e^{(6i\,dx+6i\,c)}+945i\,a^2e^{(4i\,d}\right.}{5760\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/5760*(-5*I*a^2*e^(14*I*d*x + 14*I*c) - 45*I*a^2*e^(12*I*d*x + 12*I*c) - 1
89*I*a^2*e^(10*I*d*x + 10*I*c) - 525*I*a^2*e^(8*I*d*x + 8*I*c) - 1575*I*a^2
*e^(6*I*d*x + 6*I*c) + 945*I*a^2*e^(4*I*d*x + 4*I*c) + 105*I*a^2*e^(2*I*d*x
 + 2*I*c) + 9*I*a^2)*e^(-5*I*d*x - 5*I*c)/d
```

giac [B] time = 2.12, size = 669, normalized size = 6.37

$$-\frac{18585\,a^2e^{(9i\,dx+3i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}+1\right)+37170\,a^2e^{(7i\,dx+i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}+1\right)+18585\,a^2e^{(5i\,dx-i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -1/92160*(18585*a^2*e^(9*I*d*x + 3*I*c)*log(I*e^(I*d*x + I*c) + 1) + 37170*
a^2*e^(7*I*d*x + I*c)*log(I*e^(I*d*x + I*c) + 1) + 18585*a^2*e^(5*I*d*x - I
*c)*log(I*e^(I*d*x + I*c) + 1) + 14625*a^2*e^(9*I*d*x + 3*I*c)*log(I*e^(I*d
*x + I*c) - 1) + 29250*a^2*e^(7*I*d*x + I*c)*log(I*e^(I*d*x + I*c) - 1) + 1
4625*a^2*e^(5*I*d*x - I*c)*log(I*e^(I*d*x + I*c) - 1) - 18585*a^2*e^(9*I*d*
x + 3*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 37170*a^2*e^(7*I*d*x + I*c)*log(-I
*e^(I*d*x + I*c) + 1) - 18585*a^2*e^(5*I*d*x - I*c)*log(-I*e^(I*d*x + I*c)
+ 1) - 14625*a^2*e^(9*I*d*x + 3*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 29250*a^
2*e^(7*I*d*x + I*c)*log(-I*e^(I*d*x + I*c) - 1) - 14625*a^2*e^(5*I*d*x - I*
c)*log(-I*e^(I*d*x + I*c) - 1) - 3960*a^2*e^(9*I*d*x + 3*I*c)*log(I*e^(I*d*
x) + e^(-I*c)) - 7920*a^2*e^(7*I*d*x + I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 3
960*a^2*e^(5*I*d*x - I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 3960*a^2*e^(9*I*d*x
 + 3*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 7920*a^2*e^(7*I*d*x + I*c)*log(-I*
e^(I*d*x) + e^(-I*c)) + 3960*a^2*e^(5*I*d*x - I*c)*log(-I*e^(I*d*x) + e^(-I
*c)) + 80*I*a^2*e^(18*I*d*x + 12*I*c) + 880*I*a^2*e^(16*I*d*x + 10*I*c) + 4
544*I*a^2*e^(14*I*d*x + 8*I*c) + 15168*I*a^2*e^(12*I*d*x + 6*I*c) + 45024*I
*a^2*e^(10*I*d*x + 4*I*c) + 43680*I*a^2*e^(8*I*d*x + 2*I*c) - 18624*I*a^2*e
^(4*I*d*x - 2*I*c) - 1968*I*a^2*e^(2*I*d*x - 4*I*c) - 6720*I*a^2*e^(6*I*d*x
) - 144*I*a^2*e^(-6*I*c))/(d*e^(9*I*d*x + 3*I*c) + 2*d*e^(7*I*d*x + I*c) +
d*e^(5*I*d*x - I*c))
```

maple [A] time = 0.52, size = 131, normalized size = 1.25

$$\frac{-a^2\left(-\frac{\sin(dx+c)\left(\cos^8(dx+c)\right)}{9}+\frac{\left(\frac{16}{5}+\cos^6(dx+c)+\frac{6\left(\cos^4(dx+c)\right)}{5}+\frac{8\left(\cos^2(dx+c)\right)}{5}\right)\sin(dx+c)}{63}\right)-\frac{2ia^2\left(\cos^9(dx+c)\right)}{9}+\frac{a^2\left(\frac{128}{35}+\cos^8(dx+c)+\frac{8\left(\cos^6(dx\right.}{7}\right.}{}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(-a^2*(-1/9*sin(d*x+c)*cos(d*x+c)^8+1/63*(16/5+cos(d*x+c)^6+6/5*cos(d*x
+c)^4+8/5*cos(d*x+c)^2)*sin(d*x+c))-2/9*I*a^2*cos(d*x+c)^9+1/9*a^2*(128/35+
cos(d*x+c)^8+8/7*cos(d*x+c)^6+48/35*cos(d*x+c)^4+64/35*cos(d*x+c)^2)*sin(d*
x+c))
```

maxima [A] time = 0.41, size = 119, normalized size = 1.13

$$-\frac{70i\,a^2\cos(dx+c)^9-\left(35\,\sin(dx+c)^9-135\,\sin(dx+c)^7+189\,\sin(dx+c)^5-105\,\sin(dx+c)^3\right)a^2-\left(35\right.}{315\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/315*(70*I*a^2*cos(d*x + c)^9 - (35*sin(d*x + c)^9 - 135*sin(d*x + c)^7 +
 189*sin(d*x + c)^5 - 105*sin(d*x + c)^3)*a^2 - (35*sin(d*x + c)^9 - 180*si
n(d*x + c)^7 + 378*sin(d*x + c)^5 - 420*sin(d*x + c)^3 + 315*sin(d*x + c))*
a^2)/d
```

mupad [B] time = 5.08, size = 330, normalized size = 3.14

$$\frac{2\,a^2\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)-2\mathrm{i}\right)}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)}+\frac{1024\,a^2\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)-\mathrm{i}\right)}{9\,d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)^9}-\frac{8\,a^2\left(5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)-12\mathrm{i}\right)}{3\,d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)^2}-\frac{512\,a^2\left(8\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)-\right.}{9\,d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^9*(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] (2*a^2*(tan(c/2 + (d*x)/2) - 2i))/(d*(tan(c/2 + (d*x)/2)^2 + 1)) + (1024*a^
2*(tan(c/2 + (d*x)/2) - 1i))/(9*d*(tan(c/2 + (d*x)/2)^2 + 1)^9) - (8*a^2*(5
*tan(c/2 + (d*x)/2) - 12i))/(3*d*(tan(c/2 + (d*x)/2)^2 + 1)^2) - (512*a^2*(
8*tan(c/2 + (d*x)/2) - 9i))/(9*d*(tan(c/2 + (d*x)/2)^2 + 1)^8) + (128*a^2*(
19*tan(c/2 + (d*x)/2) - 24i))/(3*d*(tan(c/2 + (d*x)/2)^2 + 1)^7) - (64*a^2*
(19*tan(c/2 + (d*x)/2) - 35i))/(5*d*(tan(c/2 + (d*x)/2)^2 + 1)^4) + (56*a^2
*(19*tan(c/2 + (d*x)/2) - 40i))/(15*d*(tan(c/2 + (d*x)/2)^2 + 1)^3) - (128*
a^2*(59*tan(c/2 + (d*x)/2) - 84i))/(9*d*(tan(c/2 + (d*x)/2)^2 + 1)^6) + (32
*a^2*(781*tan(c/2 + (d*x)/2) - 1260i))/(45*d*(tan(c/2 + (d*x)/2)^2 + 1)^5)
```

sympy [A] time = 0.78, size = 316, normalized size = 3.01

$$\begin{cases}\frac{\left(-126663739519795200ia^2d^7e^{18ic}e^{9idx}-113997365567815680 0ia^2d^7e^{16ic}e^{7idx}-4787889353848258560ia^2d^7e^{14ic}e^{5idx}-13299692649578496000ia^2\right.}{} \\ \frac{x\left(a^2e^{14ic}+7a^2e^{12ic}+21a^2e^{10ic}+35a^2e^{8ic}+35a^2e^{6ic}+21a^2e^{4ic}+7a^2e^{2ic}+a^2\right)e^{-5ic}}{128}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**9*(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Piecewise(((-126663739519795200*I*a**2*d**7*exp(18*I*c)*exp(9*I*d*x) - 1139
973655678156800*I*a**2*d**7*exp(16*I*c)*exp(7*I*d*x) - 4787889353848258560*
I*a**2*d**7*exp(14*I*c)*exp(5*I*d*x) - 13299692649578496000*I*a**2*d**7*exp
(12*I*c)*exp(3*I*d*x) - 39899077948735488000*I*a**2*d**7*exp(10*I*c)*exp(I*
d*x) + 23939446769241292800*I*a**2*d**7*exp(8*I*c)*exp(-I*d*x) + 2659938529
915699200*I*a**2*d**7*exp(6*I*c)*exp(-3*I*d*x) + 227994731135631360*I*a**2*
d**7*exp(4*I*c)*exp(-5*I*d*x))*exp(-9*I*c)/(14591662792680407040 0*d**8), Ne
(145916627926804070400*d**8*exp(9*I*c), 0)), (x*(a**2*exp(14*I*c) + 7*a**2*
exp(12*I*c) + 21*a**2*exp(10*I*c) + 35*a**2*exp(8*I*c) + 35*a**2*exp(6*I*c)
 + 21*a**2*exp(4*I*c) + 7*a**2*exp(2*I*c) + a**2)*exp(-5*I*c)/128, True))
```

3.36 $\int \sec^8(c+dx)(a+ia\tan(c+dx))^3\,dx$

Optimal. Leaf size=109

$$\frac{i(a+ia\tan(c+dx))^{10}}{10a^7d}-\frac{2i(a+ia\tan(c+dx))^9}{3a^6d}+\frac{3i(a+ia\tan(c+dx))^8}{2a^5d}-\frac{8i(a+ia\tan(c+dx))^7}{7a^4d}$$

```
[Out] -8/7*I*(a+I*a*tan(d*x+c))^7/a^4/d+3/2*I*(a+I*a*tan(d*x+c))^8/a^5/d-2/3*I*(a
+I*a*tan(d*x+c))^9/a^6/d+1/10*I*(a+I*a*tan(d*x+c))^10/a^7/d
```

Rubi [A] time = 0.06, antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{i(a+ia\tan(c+dx))^{10}}{10a^7d}-\frac{2i(a+ia\tan(c+dx))^9}{3a^6d}+\frac{3i(a+ia\tan(c+dx))^8}{2a^5d}-\frac{8i(a+ia\tan(c+dx))^7}{7a^4d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^8*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (((-8*I)/7)*(a + I*a*Tan[c + d*x])^7)/(a^4*d) + (((3*I)/2)*(a + I*a*Tan[c +
 d*x])^8)/(a^5*d) - (((2*I)/3)*(a + I*a*Tan[c + d*x])^9)/(a^6*d) + ((I/10)*
(a + I*a*Tan[c + d*x])^10)/(a^7*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^8(c+dx)(a+ia\tan(c+dx))^3\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^3(a+x)^6\,dx, x, ia\tan(c+dx)\right)}{a^7d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(8a^3(a+x)^6-12a^2(a+x)^7+6a(a+x)^8-(a+x)^9\right)dx, x,\right.}{a^7d}\\ &= -\frac{8i(a+ia\tan(c+dx))^7}{7a^4d}+\frac{3i(a+ia\tan(c+dx))^8}{2a^5d}-\frac{2i(a+ia\tan(c+d}{3a^6d}\end{aligned}$$

Mathematica [A] time = 2.07, size = 117, normalized size = 1.07

$$\frac{a^3\sec(c)\sec^{10}(c+dx)(105\sin(c+2dx)-105\sin(3c+2dx)+120\sin(3c+4dx)+45\sin(5c+6dx)+10\sin(7c}{840d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^8*(a + I*a*Tan[c + d*x])^3,x]
```

[Out] (a^3*Sec[c]*Sec[c + d*x]^10*((126*I)*Cos[c] + (105*I)*Cos[c + 2*d*x] + (105*I)*Cos[3*c + 2*d*x] - 126*Sin[c] + 105*Sin[c + 2*d*x] - 105*Sin[3*c + 2*d*x] + 120*Sin[3*c + 4*d*x] + 45*Sin[5*c + 6*d*x] + 10*Sin[7*c + 8*d*x] + Sin[9*c + 10*d*x]))/(840*d)

fricas [B] time = 0.52, size = 215, normalized size = 1.97

$$\frac{26880i\,a^3e^{(12i\,dx+12i\,c)} + 32256i\,a^3e^{(10i\,dx+10i\,c)} + 26880i\,a^3e^{(8i\,dx+8i\,c)} + 15360i\,a^3e^{(6i\,dx+6i}}{105\left(de^{(20i\,dx+20i\,c)} + 10\,de^{(18i\,dx+18i\,c)} + 45\,de^{(16i\,dx+16i\,c)} + 120\,de^{(14i\,dx+14i\,c)} + 210\,de^{(12i\,dx+12i\,c)} + 252\,de^{(10i\,dx+10}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")

[Out] 1/105*(26880*I*a^3*e^(12*I*d*x + 12*I*c) + 32256*I*a^3*e^(10*I*d*x + 10*I*c) + 26880*I*a^3*e^(8*I*d*x + 8*I*c) + 15360*I*a^3*e^(6*I*d*x + 6*I*c) + 5760*I*a^3*e^(4*I*d*x + 4*I*c) + 1280*I*a^3*e^(2*I*d*x + 2*I*c) + 128*I*a^3)/(d*e^(20*I*d*x + 20*I*c) + 10*d*e^(18*I*d*x + 18*I*c) + 45*d*e^(16*I*d*x + 16*I*c) + 120*d*e^(14*I*d*x + 14*I*c) + 210*d*e^(12*I*d*x + 12*I*c) + 252*d*e^(10*I*d*x + 10*I*c) + 210*d*e^(8*I*d*x + 8*I*c) + 120*d*e^(6*I*d*x + 6*I*c) + 45*d*e^(4*I*d*x + 4*I*c) + 10*d*e^(2*I*d*x + 2*I*c) + d)

giac [A] time = 1.31, size = 108, normalized size = 0.99

$$-\frac{21i\,a^3\tan\left(dx+c\right)^{10} + 70\,a^3\tan\left(dx+c\right)^9 + 240\,a^3\tan\left(dx+c\right)^7 - 210i\,a^3\tan\left(dx+c\right)^6 + 252\,a^3\tan\left(dx+c\right)^5}{210\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^3,x, algorithm="giac")

[Out] -1/210*(21*I*a^3*tan(d*x + c)^10 + 70*a^3*tan(d*x + c)^9 + 240*a^3*tan(d*x + c)^7 - 210*I*a^3*tan(d*x + c)^6 + 252*a^3*tan(d*x + c)^5 - 420*I*a^3*tan(d*x + c)^4 - 315*I*a^3*tan(d*x + c)^2 - 210*a^3*tan(d*x + c))/d

maple [B] time = 0.46, size = 220, normalized size = 2.02

$$\frac{-ia^3\left(\frac{\sin^4(dx+c)}{10\cos(dx+c)^{10}} + \frac{3\left(\sin^4(dx+c)\right)}{40\cos(dx+c)^8} + \frac{\sin^4(dx+c)}{20\cos(dx+c)^6} + \frac{\sin^4(dx+c)}{40\cos(dx+c)^4}\right) - 3a^3\left(\frac{\sin^3(dx+c)}{9\cos(dx+c)^9} + \frac{2\left(\sin^3(dx+c)\right)}{21\cos(dx+c)^7} + \frac{8\left(\sin^3(dx+c)\right)}{105\cos(dx+c)^5} + \right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^3,x)

[Out] 1/d*(-I*a^3*(1/10*sin(d*x+c)^4/cos(d*x+c)^10+3/40*sin(d*x+c)^4/cos(d*x+c)^8+1/20*sin(d*x+c)^4/cos(d*x+c)^6+1/40*sin(d*x+c)^4/cos(d*x+c)^4)-3*a^3*(1/9*sin(d*x+c)^3/cos(d*x+c)^9+2/21*sin(d*x+c)^3/cos(d*x+c)^7+8/105*sin(d*x+c)^3/cos(d*x+c)^5+16/315*sin(d*x+c)^3/cos(d*x+c)^3)+3/8*I*a^3/cos(d*x+c)^8-a^3*(-16/35-1/7*sec(d*x+c)^6-6/35*sec(d*x+c)^4-8/35*sec(d*x+c)^2)*tan(d*x+c))

maxima [A] time = 0.60, size = 108, normalized size = 0.99

$$\frac{-84i\,a^3\tan\left(dx+c\right)^{10} - 280\,a^3\tan\left(dx+c\right)^9 - 960\,a^3\tan\left(dx+c\right)^7 + 840i\,a^3\tan\left(dx+c\right)^6 - 1008\,a^3\tan\left(dx+\right.}{840\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")

[Out] 1/840*(-84*I*a^3*tan(d*x + c)^10 - 280*a^3*tan(d*x + c)^9 - 960*a^3*tan(d*x + c)^7 + 840*I*a^3*tan(d*x + c)^6 - 1008*a^3*tan(d*x + c)^5 + 1680*I*a^3*tan(d*x + c)^4 + 1260*I*a^3*tan(d*x + c)^2 + 840*a^3*tan(d*x + c))/d

mupad [B] time = 3.31, size = 151, normalized size = 1.39

$$-\frac{a^3\sin(c+d\,x)\,\left(-210\cos(c+d\,x)^9-\cos(c+d\,x)^8\sin(c+d\,x)\,315\mathrm{i}-\cos(c+d\,x)^6\sin(c+d\,x)^3\,420\mathrm{i}+252\,\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^3/cos(c + d*x)^8,x)
```

```
[Out] -(a^3*sin(c + d*x)*(70*cos(c + d*x)*sin(c + d*x)^8 - cos(c + d*x)^8*sin(c +
 d*x)*315i - 210*cos(c + d*x)^9 + sin(c + d*x)^9*21i + 240*cos(c + d*x)^3*s
in(c + d*x)^6 - cos(c + d*x)^4*sin(c + d*x)^5*210i + 252*cos(c + d*x)^5*sin
(c + d*x)^4 - cos(c + d*x)^6*sin(c + d*x)^3*420i))/(210*d*cos(c + d*x)^10)
```

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

$$-ia^3\left(\int i\sec^8(c+dx)\,dx+\int\left(-3\tan(c+dx)\sec^8(c+dx)\right)\,dx+\int\tan^3(c+dx)\sec^8(c+dx)\,dx+\int\left(-3i\tan\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8*(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] -I*a**3*(Integral(I*sec(c + d*x)**8, x) + Integral(-3*tan(c + d*x)*sec(c +
d*x)**8, x) + Integral(tan(c + d*x)**3*sec(c + d*x)**8, x) + Integral(-3*I*
tan(c + d*x)**2*sec(c + d*x)**8, x))
```

3.37 $\int \sec^6(c+dx)(a+ia\tan(c+dx))^3\,dx$

Optimal. Leaf size=82

$$-\frac{i(a+ia\tan(c+dx))^8}{8a^5d}+\frac{4i(a+ia\tan(c+dx))^7}{7a^4d}-\frac{2i(a+ia\tan(c+dx))^6}{3a^3d}$$

```
[Out] -2/3*I*(a+I*a*tan(d*x+c))^6/a^3/d+4/7*I*(a+I*a*tan(d*x+c))^7/a^4/d-1/8*I*(a
+I*a*tan(d*x+c))^8/a^5/d
```

Rubi [A] time = 0.06, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$-\frac{i(a+ia\tan(c+dx))^8}{8a^5d}+\frac{4i(a+ia\tan(c+dx))^7}{7a^4d}-\frac{2i(a+ia\tan(c+dx))^6}{3a^3d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (((-2*I)/3)*(a + I*a*Tan[c + d*x])^6)/(a^3*d) + (((4*I)/7)*(a + I*a*Tan[c +
 d*x])^7)/(a^4*d) - ((I/8)*(a + I*a*Tan[c + d*x])^8)/(a^5*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^6(c+dx)(a+ia\tan(c+dx))^3\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^2(a+x)^5\,dx, x, ia\tan(c+dx)\right)}{a^5d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(4a^2(a+x)^5-4a(a+x)^6+(a+x)^7\right)dx, x, ia\tan(c+d\right.}{a^5d}\\ &= -\frac{2i(a+ia\tan(c+dx))^6}{3a^3d}+\frac{4i(a+ia\tan(c+dx))^7}{7a^4d}-\frac{i(a+ia\tan(c+}{8a^5d}\end{aligned}$$

Mathematica [A] time = 1.57, size = 106, normalized size = 1.29

$$\frac{a^3\sec(c)\sec^8(c+dx)(28\sin(c+2dx)-28\sin(3c+2dx)+28\sin(3c+4dx)+8\sin(5c+6dx)+\sin(7c+8dx}{168d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (a^3*Sec[c]*Sec[c + d*x]^8*((35*I)*Cos[c] + (28*I)*Cos[c + 2*d*x] + (28*I)*
Cos[3*c + 2*d*x] - 35*Sin[c] + 28*Sin[c + 2*d*x] - 28*Sin[3*c + 2*d*x] + 28
*Sin[3*c + 4*d*x] + 8*Sin[5*c + 6*d*x] + Sin[7*c + 8*d*x]))/(168*d)
```

fricas [B] time = 0.40, size = 177, normalized size = 2.16

$$\frac{1792i\,a^3e^{(10i\,dx+10i\,c)} + 2240i\,a^3e^{(8i\,dx+8i\,c)} + 1792i\,a^3e^{(6i\,dx+6i\,c)} + 896i\,a^3e^{(4i\,dx+4i\,c)} + 256i\,a^3e^{(2i\,dx+2}}{21\left(de^{(16i\,dx+16i\,c)} + 8\,de^{(14i\,dx+14i\,c)} + 28\,de^{(12i\,dx+12i\,c)} + 56\,de^{(10i\,dx+10i\,c)} + 70\,de^{(8i\,dx+8i\,c)} + 56\,de^{(6i\,dx+6i\,c)} + 28\,de^{(4i}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/21*(1792*I*a^3*e^(10*I*d*x + 10*I*c) + 2240*I*a^3*e^(8*I*d*x + 8*I*c) + 1
792*I*a^3*e^(6*I*d*x + 6*I*c) + 896*I*a^3*e^(4*I*d*x + 4*I*c) + 256*I*a^3*e
^(2*I*d*x + 2*I*c) + 32*I*a^3)/(d*e^(16*I*d*x + 16*I*c) + 8*d*e^(14*I*d*x +
 14*I*c) + 28*d*e^(12*I*d*x + 12*I*c) + 56*d*e^(10*I*d*x + 10*I*c) + 70*d*e
^(8*I*d*x + 8*I*c) + 56*d*e^(6*I*d*x + 6*I*c) + 28*d*e^(4*I*d*x + 4*I*c) +
8*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [A] time = 1.42, size = 108, normalized size = 1.32

$$-\frac{21i\,a^3\tan(dx+c)^8 + 72\,a^3\tan(dx+c)^7 - 28i\,a^3\tan(dx+c)^6 + 168\,a^3\tan(dx+c)^5 - 210i\,a^3\tan(dx+c)^4 + 5}{168\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -1/168*(21*I*a^3*tan(d*x + c)^8 + 72*a^3*tan(d*x + c)^7 - 28*I*a^3*tan(d*x
+ c)^6 + 168*a^3*tan(d*x + c)^5 - 210*I*a^3*tan(d*x + c)^4 + 56*a^3*tan(d*x
 + c)^3 - 252*I*a^3*tan(d*x + c)^2 - 168*a^3*tan(d*x + c))/d
```

maple [B] time = 0.44, size = 174, normalized size = 2.12

$$\frac{-ia^3\left(\frac{\sin^4(dx+c)}{8\cos(dx+c)^8} + \frac{\sin^4(dx+c)}{12\cos(dx+c)^6} + \frac{\sin^4(dx+c)}{24\cos(dx+c)^4}\right) - 3a^3\left(\frac{\sin^3(dx+c)}{7\cos(dx+c)^7} + \frac{4(\sin^3(dx+c))}{35\cos(dx+c)^5} + \frac{8(\sin^3(dx+c))}{105\cos(dx+c)^3}\right) + \frac{ia^3}{2\cos(dx+c)^6} - a^3\left(-\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(-I*a^3*(1/8*sin(d*x+c)^4/cos(d*x+c)^8+1/12*sin(d*x+c)^4/cos(d*x+c)^6+1
/24*sin(d*x+c)^4/cos(d*x+c)^4)-3*a^3*(1/7*sin(d*x+c)^3/cos(d*x+c)^7+4/35*si
n(d*x+c)^3/cos(d*x+c)^5+8/105*sin(d*x+c)^3/cos(d*x+c)^3)+1/2*I*a^3/cos(d*x+
c)^6-a^3*(-8/15-1/5*sec(d*x+c)^4-4/15*sec(d*x+c)^2)*tan(d*x+c))
```

maxima [A] time = 0.38, size = 108, normalized size = 1.32

$$\frac{-105i\,a^3\tan(dx+c)^8 - 360\,a^3\tan(dx+c)^7 + 140i\,a^3\tan(dx+c)^6 - 840\,a^3\tan(dx+c)^5 + 1050i\,a^3\tan(dx+c)}{840\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/840*(-105*I*a^3*tan(d*x + c)^8 - 360*a^3*tan(d*x + c)^7 + 140*I*a^3*tan(d
*x + c)^6 - 840*a^3*tan(d*x + c)^5 + 1050*I*a^3*tan(d*x + c)^4 - 280*a^3*ta
n(d*x + c)^3 + 1260*I*a^3*tan(d*x + c)^2 + 840*a^3*tan(d*x + c))/d
```

mupad [B] time = 3.29, size = 151, normalized size = 1.84

$$-\frac{a^3\sin(c+d\,x)\left(-168\cos(c+d\,x)^7 - \cos(c+d\,x)^6\sin(c+d\,x)\,252\mathrm{i} + 56\cos(c+d\,x)^5\sin(c+d\,x)^2 - \cos(c\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^3/cos(c + d*x)^6,x)
```

```
[Out] -(a^3*sin(c + d*x)*(72*cos(c + d*x)*sin(c + d*x)^6 - cos(c + d*x)^6*sin(c +
 d*x)*252i - 168*cos(c + d*x)^7 + sin(c + d*x)^7*21i - cos(c + d*x)^2*sin(c
 + d*x)^5*28i + 168*cos(c + d*x)^3*sin(c + d*x)^4 - cos(c + d*x)^4*sin(c +
d*x)^3*210i + 56*cos(c + d*x)^5*sin(c + d*x)^2))/(168*d*cos(c + d*x)^8)
```

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

$$-ia^3 \left(\int i \sec^6(c+dx)\, dx + \int \left(-3\tan(c+dx)\sec^6(c+dx)\right) dx + \int \tan^3(c+dx)\sec^6(c+dx)\, dx + \int \left(-3i\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6*(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] -I*a**3*(Integral(I*sec(c + d*x)**6, x) + Integral(-3*tan(c + d*x)*sec(c +
d*x)**6, x) + Integral(tan(c + d*x)**3*sec(c + d*x)**6, x) + Integral(-3*I*
tan(c + d*x)**2*sec(c + d*x)**6, x))
```

3.38 $\int \sec^4(c+dx)(a+ia\tan(c+dx))^3\,dx$

Optimal. Leaf size=55

$$\frac{i(a+ia\tan(c+dx))^6}{6a^3d}-\frac{2i(a+ia\tan(c+dx))^5}{5a^2d}$$

```
[Out] -2/5*I*(a+I*a*tan(d*x+c))^5/a^2/d+1/6*I*(a+I*a*tan(d*x+c))^6/a^3/d
```

Rubi [A] time = 0.04, antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{i(a+ia\tan(c+dx))^6}{6a^3d}-\frac{2i(a+ia\tan(c+dx))^5}{5a^2d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (((-2*I)/5)*(a + I*a*Tan[c + d*x])^5)/(a^2*d) + ((I/6)*(a + I*a*Tan[c + d*x
])^6)/(a^3*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^4(c+dx)(a+ia\tan(c+dx))^3\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)(a+x)^4\,dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(2a(a+x)^4-(a+x)^5\right)dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{2i(a+ia\tan(c+dx))^5}{5a^2d}+\frac{i(a+ia\tan(c+dx))^6}{6a^3d}\end{aligned}$$

Mathematica [A] time = 1.30, size = 97, normalized size = 1.76

$$\frac{a^3\sec(c)\sec^6(c+dx)(15\sin(c+2dx)-15\sin(3c+2dx)+12\sin(3c+4dx)+2\sin(5c+6dx)+15i\cos(c+2dx)}{60d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (a^3*Sec[c]*Sec[c + d*x]^6*((20*I)*Cos[c] + (15*I)*Cos[c + 2*d*x] + (15*I)*
Cos[3*c + 2*d*x] - 20*Sin[c] + 15*Sin[c + 2*d*x] - 15*Sin[3*c + 2*d*x] + 12
*Sin[3*c + 4*d*x] + 2*Sin[5*c + 6*d*x]))/(60*d)
```

fricas [B] time = 0.59, size = 139, normalized size = 2.53

$$\frac{480i\,a^3e^{(8i\,dx+8i\,c)} + 640i\,a^3e^{(6i\,dx+6i\,c)} + 480i\,a^3e^{(4i\,dx+4i\,c)} + 192i\,a^3e^{(2i\,dx+2i\,c)} + 32i\,a^3}{15\left(de^{(12i\,dx+12i\,c)} + 6\,de^{(10i\,dx+10i\,c)} + 15\,de^{(8i\,dx+8i\,c)} + 20\,de^{(6i\,dx+6i\,c)} + 15\,de^{(4i\,dx+4i\,c)} + 6\,de^{(2i\,dx+2i\,c)} + d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/15*(480*I*a^3*e^(8*I*d*x + 8*I*c) + 640*I*a^3*e^(6*I*d*x + 6*I*c) + 480*I
*a^3*e^(4*I*d*x + 4*I*c) + 192*I*a^3*e^(2*I*d*x + 2*I*c) + 32*I*a^3)/(d*e^(
12*I*d*x + 12*I*c) + 6*d*e^(10*I*d*x + 10*I*c) + 15*d*e^(8*I*d*x + 8*I*c) +
 20*d*e^(6*I*d*x + 6*I*c) + 15*d*e^(4*I*d*x + 4*I*c) + 6*d*e^(2*I*d*x + 2*I
*c) + d)
```

giac [A] time = 1.62, size = 82, normalized size = 1.49

$$-\frac{5i\,a^3\tan\left(dx+c\right)^6 + 18\,a^3\tan\left(dx+c\right)^5 - 15i\,a^3\tan\left(dx+c\right)^4 + 20\,a^3\tan\left(dx+c\right)^3 - 45i\,a^3\tan\left(dx+c\right)^2 - 30}{30\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -1/30*(5*I*a^3*tan(d*x + c)^6 + 18*a^3*tan(d*x + c)^5 - 15*I*a^3*tan(d*x +
c)^4 + 20*a^3*tan(d*x + c)^3 - 45*I*a^3*tan(d*x + c)^2 - 30*a^3*tan(d*x + c
))/d
```

maple [B] time = 0.44, size = 128, normalized size = 2.33

$$\frac{-ia^3\left(\frac{\sin^4(dx+c)}{6\cos(dx+c)^6} + \frac{\sin^4(dx+c)}{12\cos(dx+c)^4}\right) - 3a^3\left(\frac{\sin^3(dx+c)}{5\cos(dx+c)^5} + \frac{2\left(\sin^3(dx+c)\right)}{15\cos(dx+c)^3}\right) + \frac{3ia^3}{4\cos(dx+c)^4} - a^3\left(-\frac{2}{3} - \frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan\left(dx+\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(-I*a^3*(1/6*sin(d*x+c)^4/cos(d*x+c)^6+1/12*sin(d*x+c)^4/cos(d*x+c)^4)-
3*a^3*(1/5*sin(d*x+c)^3/cos(d*x+c)^5+2/15*sin(d*x+c)^3/cos(d*x+c)^3)+3/4*I*
a^3/cos(d*x+c)^4-a^3*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c))
```

maxima [A] time = 0.53, size = 82, normalized size = 1.49

$$\frac{-10i\,a^3\tan\left(dx+c\right)^6 - 36\,a^3\tan\left(dx+c\right)^5 + 30i\,a^3\tan\left(dx+c\right)^4 - 40\,a^3\tan\left(dx+c\right)^3 + 90i\,a^3\tan\left(dx+c\right)^2 + 6}{60\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/60*(-10*I*a^3*tan(d*x + c)^6 - 36*a^3*tan(d*x + c)^5 + 30*I*a^3*tan(d*x +
 c)^4 - 40*a^3*tan(d*x + c)^3 + 90*I*a^3*tan(d*x + c)^2 + 60*a^3*tan(d*x +
c))/d
```

mupad [B] time = 3.26, size = 114, normalized size = 2.07

$$-\frac{a^3\sin\left(c+d\,x\right)\left(-30\cos\left(c+d\,x\right)^5 - \cos\left(c+d\,x\right)^4\sin\left(c+d\,x\right)45\mathrm{i} + 20\cos\left(c+d\,x\right)^3\sin\left(c+d\,x\right)^2 - \cos\left(c\right.\right.}{30\,d\cos\left(c+d\,x\right)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^3/cos(c + d*x)^4,x)
```

```
[Out] -(a^3*sin(c + d*x)*(18*cos(c + d*x)*sin(c + d*x)^4 - cos(c + d*x)^4*sin(c +
 d*x)*45i - 30*cos(c + d*x)^5 + sin(c + d*x)^5*5i - cos(c + d*x)^2*sin(c +
d*x)^3*15i + 20*cos(c + d*x)^3*sin(c + d*x)^2))/(30*d*cos(c + d*x)^6)
```

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

$$-ia^3\left(\int i\sec^4(c+dx)\,dx+\int\left(-3\tan(c+dx)\sec^4(c+dx)\right)dx+\int\tan^3(c+dx)\sec^4(c+dx)\,dx+\int\left(-3i\tan\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4*(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] -I*a**3*(Integral(I*sec(c + d*x)**4, x) + Integral(-3*tan(c + d*x)*sec(c +
d*x)**4, x) + Integral(tan(c + d*x)**3*sec(c + d*x)**4, x) + Integral(-3*I*
tan(c + d*x)**2*sec(c + d*x)**4, x))
```

3.39 $\int \sec^2(c+dx)(a+ia\tan(c+dx))^3\,dx$

Optimal. Leaf size=27

$$-\frac{i(a+ia\tan(c+dx))^4}{4ad}$$

```
[Out] -1/4*I*(a+I*a*tan(d*x+c))^4/a/d
```

Rubi [A] time = 0.04, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = $\{3487, 32\}$

$$-\frac{i(a+ia\tan(c+dx))^4}{4ad}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] ((-I/4)*(a + I*a*Tan[c + d*x])^4)/(a*d)
```

Rule 32

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^2(c+dx)(a+ia\tan(c+dx))^3\,dx &= -\frac{i\,\text{Subst}\left(\int (a+x)^3\,dx, x, ia\tan(c+dx)\right)}{ad}\\ &= -\frac{i(a+ia\tan(c+dx))^4}{4ad}\end{aligned}$$

Mathematica [B] time = 0.70, size = 84, normalized size = 3.11

$$\frac{a^3\sec(c)\sec^4(c+dx)(2\sin(c+2dx)-2\sin(3c+2dx)+\sin(3c+4dx)+2i\cos(c+2dx)+2i\cos(3c+2dx)-}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (a^3*Sec[c]*Sec[c + d*x]^4*((3*I)*Cos[c] + (2*I)*Cos[c + 2*d*x] + (2*I)*Cos
[3*c + 2*d*x] - 3*Sin[c] + 2*Sin[c + 2*d*x] - 2*Sin[3*c + 2*d*x] + Sin[3*c
+ 4*d*x]))/(4*d)
```

fricas [B] time = 0.45, size = 100, normalized size = 3.70

$$\frac{16i\,a^3e^{(6i\,dx+6i\,c)}+24i\,a^3e^{(4i\,dx+4i\,c)}+16i\,a^3e^{(2i\,dx+2i\,c)}+4i\,a^3}{de^{(8i\,dx+8i\,c)}+4\,de^{(6i\,dx+6i\,c)}+6\,de^{(4i\,dx+4i\,c)}+4\,de^{(2i\,dx+2i\,c)}+d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] (16*I*a^3*e^(6*I*d*x + 6*I*c) + 24*I*a^3*e^(4*I*d*x + 4*I*c) + 16*I*a^3*e^(
2*I*d*x + 2*I*c) + 4*I*a^3)/(d*e^(8*I*d*x + 8*I*c) + 4*d*e^(6*I*d*x + 6*I*c
) + 6*d*e^(4*I*d*x + 4*I*c) + 4*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [B] time = 1.15, size = 56, normalized size = 2.07

$$-\frac{i a^3 \tan(dx+c)^4 + 4 a^3 \tan(dx+c)^3 - 6i a^3 \tan(dx+c)^2 - 4 a^3 \tan(dx+c)}{4 d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -1/4*(I*a^3*tan(d*x + c)^4 + 4*a^3*tan(d*x + c)^3 - 6*I*a^3*tan(d*x + c)^2
- 4*a^3*tan(d*x + c))/d
```

maple [B] time = 0.45, size = 73, normalized size = 2.70

$$\frac{-\frac{i a^3 \left(\sin^4(dx+c)\right)}{4\cos(dx+c)^4} - \frac{a^3 \left(\sin^3(dx+c)\right)}{\cos(dx+c)^3} + \frac{3 i a^3}{2\cos(dx+c)^2} + a^3 \tan(dx+c)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(-1/4*I*a^3*sin(d*x+c)^4/cos(d*x+c)^4-a^3*sin(d*x+c)^3/cos(d*x+c)^3+3/2
*I*a^3/cos(d*x+c)^2+a^3*tan(d*x+c))
```

maxima [A] time = 0.50, size = 21, normalized size = 0.78

$$-\frac{i (i a \tan(dx+c) + a)^4}{4 a d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/4*I*(I*a*tan(d*x + c) + a)^4/(a*d)
```

mupad [B] time = 3.27, size = 56, normalized size = 2.07

$$\frac{-\frac{a^3 \tan(c+d\,x)^4\,1i}{4} - a^3 \tan(c+d\,x)^3 + \frac{a^3 \tan(c+d\,x)^2\,3i}{2} + a^3 \tan(c+d\,x)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^3/cos(c + d*x)^2,x)
```

```
[Out] (a^3*tan(c + d*x) + (a^3*tan(c + d*x)^2*3i)/2 - a^3*tan(c + d*x)^3 - (a^3*t
an(c + d*x)^4*1i)/4)/d
```

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

$$-ia^3 \left(\int i \sec^2(c+dx)\, dx + \int \left(-3\tan(c+dx)\sec^2(c+dx)\right) dx + \int \tan^3(c+dx)\sec^2(c+dx)\, dx + \int \left(-3i \tan\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2*(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] -I*a**3*(Integral(I*sec(c + d*x)**2, x) + Integral(-3*tan(c + d*x)*sec(c +
d*x)**2, x) + Integral(tan(c + d*x)**3*sec(c + d*x)**2, x) + Integral(-3*I*
tan(c + d*x)**2*sec(c + d*x)**2, x))
```

3.40 $\int (a+ia\tan(c+dx))^3\,dx$

Optimal. Leaf size=63

$$-\frac{2a^3\tan(c+dx)}{d}-\frac{4ia^3\log(\cos(c+dx))}{d}+4a^3x+\frac{ia(a+ia\tan(c+dx))^2}{2d}$$

```
[Out] 4*a^3*x-4*I*a^3*ln(cos(d*x+c))/d-2*a^3*tan(d*x+c)/d+1/2*I*a*(a+I*a*tan(d*x+
c))^2/d
```

Rubi [A] time = 0.03, antiderivative size = 63, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3478, 3477, 3475}

$$-\frac{2a^3\tan(c+dx)}{d}-\frac{4ia^3\log(\cos(c+dx))}{d}+4a^3x+\frac{ia(a+ia\tan(c+dx))^2}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] 4*a^3*x - ((4*I)*a^3*Log[Cos[c + d*x]])/d - (2*a^3*Tan[c + d*x])/d + ((I/2)
*a*(a + I*a*Tan[c + d*x])^2)/d
```

Rule 3475

```
Int[tan[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[Log[RemoveContent[Cos[c + d
*x], x]]/d, x] /; FreeQ[{c, d}, x]
```

Rule 3477

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

Rule 3478

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

Rubi steps

$$\begin{aligned}\int (a+ia\tan(c+dx))^3\,dx&=\frac{ia(a+ia\tan(c+dx))^2}{2d}+(2a)\int (a+ia\tan(c+dx))^2\,dx\\&=4a^3x-\frac{2a^3\tan(c+dx)}{d}+\frac{ia(a+ia\tan(c+dx))^2}{2d}+\left(4ia^3\right)\int \tan(c+dx)\,dx\\&=4a^3x-\frac{4ia^3\log(\cos(c+dx))}{d}-\frac{2a^3\tan(c+dx)}{d}+\frac{ia(a+ia\tan(c+dx))^2}{2d}\end{aligned}$$

Mathematica [A] time = 1.04, size = 119, normalized size = 1.89

$$\frac{a^3\sec(c)\sec^2(c+dx)\left(-3\sin(c+2dx)+2dx\cos(3c+2dx)-i\cos(3c+2dx)\log\left(\cos^2(c+dx)\right)+\cos(c+2d\right.}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (a^3*Sec[c]*Sec[c + d*x]^2*(2*d*x*Cos[3*c + 2*d*x] + Cos[c + 2*d*x]*(2*d*x
- I*Log[Cos[c + d*x]^2]) + Cos[c]*(-I + 4*d*x - (2*I)*Log[Cos[c + d*x]^2])
- I*Cos[3*c + 2*d*x]*Log[Cos[c + d*x]^2] + 3*Sin[c] - 3*Sin[c + 2*d*x]))/(2
*d)
```

fricas [A] time = 0.54, size = 95, normalized size = 1.51

$$\frac{-8i\,a^3e^{(2i\,dx+2i\,c)}-6i\,a^3+\left(-4i\,a^3e^{(4i\,dx+4i\,c)}-8i\,a^3e^{(2i\,dx+2i\,c)}-4i\,a^3\right)\log\left(e^{(2i\,dx+2i\,c)}+1\right)}{de^{(4i\,dx+4i\,c)}+2\,de^{(2i\,dx+2i\,c)}+d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] (-8*I*a^3*e^(2*I*d*x + 2*I*c) - 6*I*a^3 + (-4*I*a^3*e^(4*I*d*x + 4*I*c) - 8
*I*a^3*e^(2*I*d*x + 2*I*c) - 4*I*a^3)*log(e^(2*I*d*x + 2*I*c) + 1))/(d*e^(4
*I*d*x + 4*I*c) + 2*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [B] time = 0.66, size = 117, normalized size = 1.86

$$\frac{-4i\,a^3e^{(4i\,dx+4i\,c)}\log\left(e^{(2i\,dx+2i\,c)}+1\right)-8i\,a^3e^{(2i\,dx+2i\,c)}\log\left(e^{(2i\,dx+2i\,c)}+1\right)-8i\,a^3e^{(2i\,dx+2i\,c)}-4i\,a^3\log\left(e^{(2i\,dx+2i\,c)}+\right.}{de^{(4i\,dx+4i\,c)}+2\,de^{(2i\,dx+2i\,c)}+d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] (-4*I*a^3*e^(4*I*d*x + 4*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 8*I*a^3*e^(2*I
*d*x + 2*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 8*I*a^3*e^(2*I*d*x + 2*I*c) -
4*I*a^3*log(e^(2*I*d*x + 2*I*c) + 1) - 6*I*a^3)/(d*e^(4*I*d*x + 4*I*c) + 2*
d*e^(2*I*d*x + 2*I*c) + d)
```

maple [A] time = 0.02, size = 68, normalized size = 1.08

$$-\frac{3a^3\tan(dx+c)}{d}-\frac{ia^3\left(\tan^2(dx+c)\right)}{2d}+\frac{2ia^3\ln\left(1+\tan^2(dx+c)\right)}{d}+\frac{4a^3\arctan(\tan(dx+c))}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^3,x)
```

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

maxima [A] time = 0.68, size = 76, normalized size = 1.21

$$a^3x+\frac{3\,(dx+c-\tan(dx+c))a^3}{d}+\frac{i\,a^3\left(\frac{1}{\sin(dx+c)^2-1}-\log\left(\sin(dx+c)^2-1\right)\right)}{2\,d}+\frac{3i\,a^3\log(\sec(dx+c))}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] a^3*x + 3*(d*x + c - tan(d*x + c))*a^3/d + 1/2*I*a^3*(1/(sin(d*x + c)^2 - 1
) - log(sin(d*x + c)^2 - 1))/d + 3*I*a^3*log(sec(d*x + c))/d
```

mupad [B] time = 3.28, size = 41, normalized size = 0.65

$$-\frac{a^3\,\left(6\tan(c+d\,x)-\ln(\tan(c+d\,x)+1\mathrm{i})\,8\mathrm{i}+\tan(c+d\,x)^2\,1\mathrm{i}\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] -(a^3*(6*tan(c + d*x) - log(tan(c + d*x) + 1i)*8i + tan(c + d*x)^2*1i))/(2*
d)
```

sympy [A] time = 0.31, size = 94, normalized size = 1.49

$$-\frac{4ia^3\log\left(e^{2idx}+e^{-2ic}\right)}{d}+\frac{8a^3e^{2ic}e^{2idx}+6a^3}{ide^{4ic}e^{4idx}+2ide^{2ic}e^{2idx}+id}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**3,x)
```

```
[Out] -4*I*a**3*log(exp(2*I*d*x) + exp(-2*I*c))/d + (8*a**3*exp(2*I*c)*exp(2*I*d*
x) + 6*a**3)/(I*d*exp(4*I*c)*exp(4*I*d*x) + 2*I*d*exp(2*I*c)*exp(2*I*d*x) +
 I*d)
```

3.41 $\int \cos^2(c+dx)(a+ia\tan(c+dx))^3\,dx$

Optimal. Leaf size=49

$$-\frac{2ia^4}{d(a-ia\tan(c+dx))}+\frac{ia^3\log(\cos(c+dx))}{d}-a^3x$$

```
[Out] -a^3*x+I*a^3*ln(cos(d*x+c))/d-2*I*a^4/d/(a-I*a*tan(d*x+c))
```

Rubi [A] time = 0.05, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$-\frac{2ia^4}{d(a-ia\tan(c+dx))}+\frac{ia^3\log(\cos(c+dx))}{d}-a^3x$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] -(a^3*x) + (I*a^3*Log[Cos[c + d*x]])/d - ((2*I)*a^4)/(d*(a - I*a*Tan[c + d*
x]))
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \cos^2(c+dx)(a+ia\tan(c+dx))^3\,dx &= -\frac{\left(ia^3\right)\text{Subst}\left(\int \frac{a+x}{(a-x)^2}\,dx,x,ia\tan(c+dx)\right)}{d}\\ &= -\frac{\left(ia^3\right)\text{Subst}\left(\int \left(\frac{2a}{(a-x)^2}+\frac{1}{-a+x}\right)dx,x,ia\tan(c+dx)\right)}{d}\\ &= -a^3x+\frac{ia^3\log(\cos(c+dx))}{d}-\frac{2ia^4}{d(a-ia\tan(c+dx))}\end{aligned}$$

Mathematica [B] time = 0.38, size = 99, normalized size = 2.02

$$-\frac{a^3(\cos(c+4dx)+i\sin(c+4dx))\left(\cos(c+dx)\left(-i\log\left(\cos^2(c+dx)\right)+2dx+2i\right)+\sin(c+dx)\left(-\log\left(\cos^2(c+\right.\right.\right.}{2d(\cos(dx)+i\sin(dx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] -1/2*(a^3*(Cos[c + d*x]*(2*I + 2*d*x - I*Log[Cos[c + d*x]^2]) + (-2 - (2*I)
*d*x - Log[Cos[c + d*x]^2])*Sin[c + d*x])*(Cos[c + 4*d*x] + I*Sin[c + 4*d*x
]))/(d*(Cos[d*x] + I*Sin[d*x])^3)
```

fricas [A] time = 0.63, size = 36, normalized size = 0.73

$$\frac{-i\,a^3e^{(2i\,dx+2i\,c)} + i\,a^3\log\left(e^{(2i\,dx+2i\,c)} + 1\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

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

giac [A] time = 1.94, size = 36, normalized size = 0.73

$$\frac{-i\,a^3e^{(2i\,dx+2i\,c)} + i\,a^3\log\left(e^{(2i\,dx+2i\,c)} + 1\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

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

maple [A] time = 0.32, size = 87, normalized size = 1.78

$$\frac{ia^3\left(\sin^2(dx+c)\right)}{2d} + \frac{ia^3\ln(\cos(dx+c))}{d} + \frac{2a^3\cos(dx+c)\sin(dx+c)}{d} - a^3x - \frac{a^3c}{d} - \frac{3ia^3\left(\cos^2(dx+c)\right)}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 1/2*I/d*a^3*sin(d*x+c)^2+I*a^3*ln(cos(d*x+c))/d+2*a^3*cos(d*x+c)*sin(d*x+c)
/d-a^3*x-1/d*a^3*c-3/2*I/d*a^3*cos(d*x+c)^2
```

maxima [A] time = 0.57, size = 62, normalized size = 1.27

$$-\frac{2\,(dx+c)a^3 + i\,a^3\log\left(\tan(dx+c)^2+1\right) - \frac{4\left(a^3\tan(dx+c)-i\,a^3\right)}{\tan(dx+c)^2+1}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/2*(2*(d*x + c)*a^3 + I*a^3*log(tan(d*x + c)^2 + 1) - 4*(a^3*tan(d*x + c)
 - I*a^3)/(tan(d*x + c)^2 + 1))/d
```

mupad [B] time = 3.29, size = 39, normalized size = 0.80

$$\frac{2\,a^3}{d\,\left(\tan(c+d\,x)+1{}\mathrm{i}\right)} - \frac{a^3\,\ln\left(\tan(c+d\,x)+1{}\mathrm{i}\right)\,1{}\mathrm{i}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] (2*a^3)/(d*(tan(c + d*x) + 1i)) - (a^3*log(tan(c + d*x) + 1i)*1i)/d
```

sympy [A] time = 0.32, size = 61, normalized size = 1.24

$$\frac{ia^3\log\left(e^{2idx}+e^{-2ic}\right)}{d}+\begin{cases}-\frac{ia^3e^{2ic}e^{2idx}}{d} & \text{for } d\neq 0\\ 2a^3xe^{2ic} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2*(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] I*a**3*log(exp(2*I*d*x) + exp(-2*I*c))/d + Piecewise((-I*a**3*exp(2*I*c)*ex
p(2*I*d*x)/d, Ne(d, 0)), (2*a**3*x*exp(2*I*c), True))
```

3.42 $\int \cos^4(c+dx)(a+ia\tan(c+dx))^3\,dx$

Optimal. Leaf size=27

$$-\frac{ia^5}{2d(a-ia\tan(c+dx))^2}$$

```
[Out] -1/2*I*a^5/d/(a-I*a*tan(d*x+c))^2
```

Rubi [A] time = 0.04, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 32}

$$-\frac{ia^5}{2d(a-ia\tan(c+dx))^2}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] ((-I/2)*a^5)/(d*(a - I*a*Tan[c + d*x])^2)
```

Rule 32

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \cos^4(c+dx)(a+ia\tan(c+dx))^3\,dx &= -\frac{\left(ia^5\right)\operatorname{Subst}\left(\int \frac{1}{(a-x)^3}\,dx,x,ia\tan(c+dx)\right)}{d}\\ &= -\frac{ia^5}{2d(a-ia\tan(c+dx))^2}\end{aligned}$$

Mathematica [A] time = 0.30, size = 50, normalized size = 1.85

$$\frac{a^3(3\cos(c+dx)-i\sin(c+dx))(\sin(3(c+dx))-i\cos(3(c+dx)))}{8d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (a^3*(3*Cos[c + d*x] - I*Sin[c + d*x])*((-I)*Cos[3*(c + d*x)] + Sin[3*(c +
d*x)]))/(8*d)
```

fricas [A] time = 0.48, size = 34, normalized size = 1.26

$$\frac{-i\,a^3e^{(4i\,dx+4i\,c)}-2i\,a^3e^{(2i\,dx+2i\,c)}}{8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/8*(-I*a^3*e^(4*I*d*x + 4*I*c) - 2*I*a^3*e^(2*I*d*x + 2*I*c))/d
```

giac [B] time = 1.71, size = 135, normalized size = 5.00

$$\frac{-8i a^3 e^{(12i dx+8i c)} - 48i a^3 e^{(10i dx+6i c)} - 112i a^3 e^{(8i dx+4i c)} - 128i a^3 e^{(6i dx+2i c)} - 16i a^3 e^{(2i dx-2i c)} - 72i a^3 e^{(4i dx)}}{64\left(de^{(8i dx+4i c)} + 4\,de^{(6i dx+2i c)} + 4\,de^{(2i dx-2i c)} + 6\,de^{(4i dx)} + de^{(-4i c)}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/64*(-8*I*a^3*e^(12*I*d*x + 8*I*c) - 48*I*a^3*e^(10*I*d*x + 6*I*c) - 112*I
*a^3*e^(8*I*d*x + 4*I*c) - 128*I*a^3*e^(6*I*d*x + 2*I*c) - 16*I*a^3*e^(2*I*
d*x - 2*I*c) - 72*I*a^3*e^(4*I*d*x))/(d*e^(8*I*d*x + 4*I*c) + 4*d*e^(6*I*d*
x + 2*I*c) + 4*d*e^(2*I*d*x - 2*I*c) + 6*d*e^(4*I*d*x) + d*e^(-4*I*c))
```

maple [B] time = 0.49, size = 114, normalized size = 4.22

$$\frac{-\frac{ia^3\left(\sin^4(dx+c)\right)}{4} - 3a^3\left(-\frac{\sin(dx+c)\left(\cos^3(dx+c)\right)}{4} + \frac{\cos(dx+c)\sin(dx+c)}{8} + \frac{dx}{8} + \frac{c}{8}\right) - \frac{3ia^3\left(\cos^4(dx+c)\right)}{4} + a^3\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\mathrm{si}}{4}\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(-1/4*I*a^3*sin(d*x+c)^4-3*a^3*(-1/4*sin(d*x+c)*cos(d*x+c)^3+1/8*cos(d*
x+c)*sin(d*x+c)+1/8*d*x+1/8*c)-3/4*I*a^3*cos(d*x+c)^4+a^3*(1/4*(cos(d*x+c)^
3+3/2*cos(d*x+c))*sin(d*x+c)+3/8*d*x+3/8*c))
```

maxima [B] time = 0.50, size = 57, normalized size = 2.11

$$\frac{4i a^3 \tan(dx+c)^2 + 8\,a^3 \tan(dx+c) - 4i a^3}{8\left(\tan(dx+c)^4 + 2\,\tan(dx+c)^2 + 1\right)d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/8*(4*I*a^3*tan(d*x + c)^2 + 8*a^3*tan(d*x + c) - 4*I*a^3)/((tan(d*x + c)^
4 + 2*tan(d*x + c)^2 + 1)*d)
```

mupad [B] time = 3.34, size = 36, normalized size = 1.33

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^3,x)
```

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

sympy [A] time = 0.31, size = 82, normalized size = 3.04

$$\begin{cases} \frac{-4ia^3de^{4ic}e^{4idx}-8ia^3de^{2ic}e^{2idx}}{32d^2} & \text{for } 32d^2 \neq 0 \\ x\left(\frac{a^3e^{4ic}}{2}+\frac{a^3e^{2ic}}{2}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4*(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] Piecewise((((-4*I*a**3*d*exp(4*I*c)*exp(4*I*d*x) - 8*I*a**3*d*exp(2*I*c)*exp
(2*I*d*x))/(32*d**2), Ne(32*d**2, 0)), (x*(a**3*exp(4*I*c)/2 + a**3*exp(2*I
*c)/2), True))
```

3.43 $\int \cos^6(c+dx)(a+ia\tan(c+dx))^3\,dx$

Optimal. Leaf size=90

$$-\frac{ia^6}{6d(a-ia\tan(c+dx))^3}-\frac{ia^5}{8d(a-ia\tan(c+dx))^2}-\frac{ia^4}{8d(a-ia\tan(c+dx))}+\frac{a^3x}{8}$$

```
[Out] 1/8*a^3*x-1/6*I*a^6/d/(a-I*a*tan(d*x+c))^3-1/8*I*a^5/d/(a-I*a*tan(d*x+c))^2
-1/8*I*a^4/d/(a-I*a*tan(d*x+c))
```

Rubi [A] time = 0.07, antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3487, 44, 206}

$$-\frac{ia^6}{6d(a-ia\tan(c+dx))^3}-\frac{ia^5}{8d(a-ia\tan(c+dx))^2}-\frac{ia^4}{8d(a-ia\tan(c+dx))}+\frac{a^3x}{8}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^6*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (a^3*x)/8 - ((I/6)*a^6)/(d*(a - I*a*Tan[c + d*x])^3) - ((I/8)*a^5)/(d*(a -
I*a*Tan[c + d*x])^2) - ((I/8)*a^4)/(d*(a - I*a*Tan[c + d*x]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 206

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \cos^6(c+dx)(a+ia\tan(c+dx))^3\,dx &= -\frac{\left(ia^7\right)\text{Subst}\left(\int \frac{1}{(a-x)^4(a+x)}\,dx,x,ia\tan(c+dx)\right)}{d}\\ &= -\frac{\left(ia^7\right)\text{Subst}\left(\int \left(\frac{1}{2a(a-x)^4}+\frac{1}{4a^2(a-x)^3}+\frac{1}{8a^3(a-x)^2}+\frac{1}{8a^3\left(a^2-x^2\right)}\right)dx,x,ia\tan\right.}{d}\\ &= -\frac{ia^6}{6d(a-ia\tan(c+dx))^3}-\frac{ia^5}{8d(a-ia\tan(c+dx))^2}-\frac{ia^4}{8d(a-ia\tan(c+\right.}\\ &= \frac{a^3x}{8}-\frac{ia^6}{6d(a-ia\tan(c+dx))^3}-\frac{ia^5}{8d(a-ia\tan(c+dx))^2}-\frac{ia^4}{8d(a-ia\tan\right.}\end{aligned}$$

Mathematica [A] time = 0.69, size = 109, normalized size = 1.21

$$\frac{a^3(-9\sin(c+dx)-12idx\sin(3(c+dx))+2\sin(3(c+dx))-27i\cos(c+dx)+2(6dx-i)\cos(3(c+dx)))(\cos(}{96d(\cos(dx)+i\sin(dx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^6*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (a^3*((-27*I)*Cos[c + d*x] + 2*(-I + 6*d*x)*Cos[3*(c + d*x)] - 9*Sin[c + d*
x] + 2*Sin[3*(c + d*x)] - (12*I)*d*x*Sin[3*(c + d*x)])*(Cos[3*(c + 2*d*x)]
+ I*Sin[3*(c + 2*d*x)]))/(96*d*(Cos[d*x] + I*Sin[d*x])^3)
```

fricas [A] time = 0.55, size = 55, normalized size = 0.61

$$\frac{12\,a^3dx-2i\,a^3e^{(6i\,dx+6i\,c)}-9i\,a^3e^{(4i\,dx+4i\,c)}-18i\,a^3e^{(2i\,dx+2i\,c)}}{96\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/96*(12*a^3*d*x - 2*I*a^3*e^(6*I*d*x + 6*I*c) - 9*I*a^3*e^(4*I*d*x + 4*I*c
) - 18*I*a^3*e^(2*I*d*x + 2*I*c))/d
```

giac [B] time = 2.17, size = 457, normalized size = 5.08

$$\frac{48\,a^3dxe^{(8i\,dx+4i\,c)}+192\,a^3dxe^{(6i\,dx+2i\,c)}+192\,a^3dxe^{(2i\,dx-2i\,c)}+288\,a^3dxe^{(4i\,dx)}+48\,a^3dxe^{(-4i\,c)}-12i\,a^3e^{(8i\,dx+4i\,c}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/384*(48*a^3*d*x*e^(8*I*d*x + 4*I*c) + 192*a^3*d*x*e^(6*I*d*x + 2*I*c) + 1
92*a^3*d*x*e^(2*I*d*x - 2*I*c) + 288*a^3*d*x*e^(4*I*d*x) + 48*a^3*d*x*e^(-4
*I*c) - 12*I*a^3*e^(8*I*d*x + 4*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 48*I*a^
3*e^(6*I*d*x + 2*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 48*I*a^3*e^(2*I*d*x -
2*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 72*I*a^3*e^(4*I*d*x)*log(e^(2*I*d*x +
 2*I*c) + 1) - 12*I*a^3*e^(-4*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) + 12*I*a^3*
e^(8*I*d*x + 4*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 48*I*a^3*e^(6*I*d*x + 2
*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 48*I*a^3*e^(2*I*d*x - 2*I*c)*log(e^(2
*I*d*x) + e^(-2*I*c)) + 72*I*a^3*e^(4*I*d*x)*log(e^(2*I*d*x) + e^(-2*I*c))
+ 12*I*a^3*e^(-4*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) - 8*I*a^3*e^(14*I*d*x +
 10*I*c) - 68*I*a^3*e^(12*I*d*x + 8*I*c) - 264*I*a^3*e^(10*I*d*x + 6*I*c) -
 536*I*a^3*e^(8*I*d*x + 4*I*c) - 584*I*a^3*e^(6*I*d*x + 2*I*c) - 72*I*a^3*e
^(2*I*d*x - 2*I*c) - 324*I*a^3*e^(4*I*d*x))/(d*e^(8*I*d*x + 4*I*c) + 4*d*e^
(6*I*d*x + 2*I*c) + 4*d*e^(2*I*d*x - 2*I*c) + 6*d*e^(4*I*d*x) + d*e^(-4*I*c
))
```

maple [B] time = 0.52, size = 156, normalized size = 1.73

$$\frac{-ia^3\left(-\frac{\left(\sin^2(dx+c)\right)\left(\cos^4(dx+c)\right)}{6}-\frac{\left(\cos^4(dx+c)\right)}{12}\right)-3a^3\left(-\frac{\sin(dx+c)\left(\cos^5(dx+c)\right)}{6}+\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{24}+\frac{dx}{16}+\frac{c}{16}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(-I*a^3*(-1/6*sin(d*x+c)^2*cos(d*x+c)^4-1/12*cos(d*x+c)^4)-3*a^3*(-1/6*
sin(d*x+c)*cos(d*x+c)^5+1/24*(cos(d*x+c)^3+3/2*cos(d*x+c))*sin(d*x+c)+1/16*
d*x+1/16*c)-1/2*I*a^3*cos(d*x+c)^6+a^3*(1/6*(cos(d*x+c)^5+5/4*cos(d*x+c)^3+
15/8*cos(d*x+c))*sin(d*x+c)+5/16*d*x+5/16*c))
```

maxima [A] time = 0.64, size = 105, normalized size = 1.17

$$\frac{6\,(dx+c)a^3 + \frac{6\,a^3\tan(dx+c)^5+16\,a^3\tan(dx+c)^3+12i\,a^3\tan(dx+c)^2+42\,a^3\tan(dx+c)-20i\,a^3}{\tan(dx+c)^6+3\,\tan(dx+c)^4+3\,\tan(dx+c)^2+1}}{48\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/48*(6*(d*x + c)*a^3 + (6*a^3*tan(d*x + c)^5 + 16*a^3*tan(d*x + c)^3 + 12*
I*a^3*tan(d*x + c)^2 + 42*a^3*tan(d*x + c) - 20*I*a^3)/(tan(d*x + c)^6 + 3*
tan(d*x + c)^4 + 3*tan(d*x + c)^2 + 1))/d
```

mupad [B] time = 3.36, size = 77, normalized size = 0.86

$$\frac{a^3\,x}{8} - \frac{\frac{a^3\,\tan(c+d\,x)^2}{8} + \frac{a^3\,\tan(c+d\,x)\,3\mathrm{i}}{8} - \frac{5\,a^3}{12}}{d\,\left(-\tan\left(c+d\,x\right)^3 - \tan\left(c+d\,x\right)^2\,3\mathrm{i} + 3\,\tan\left(c+d\,x\right) + 1\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] (a^3*x)/8 - ((a^3*tan(c + d*x)*3i)/8 - (5*a^3)/12 + (a^3*tan(c + d*x)^2)/8)
/(d*(3*tan(c + d*x) - tan(c + d*x)^2*3i - tan(c + d*x)^3 + 1i))
```

sympy [A] time = 0.40, size = 133, normalized size = 1.48

$$\frac{a^3x}{8} + \begin{cases} -\frac{512ia^3d^2e^{6ic}e^{6idx}+2304ia^3d^2e^{4ic}e^{4idx}+4608ia^3d^2e^{2ic}e^{2idx}}{24576d^3} & \text{for } 24576d^3 \neq 0 \\ x\left(\frac{a^3e^{6ic}}{8} + \frac{3a^3e^{4ic}}{8} + \frac{3a^3e^{2ic}}{8}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**6*(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] a**3*x/8 + Piecewise((-(512*I*a**3*d**2*exp(6*I*c)*exp(6*I*d*x) + 2304*I*a*
*3*d**2*exp(4*I*c)*exp(4*I*d*x) + 4608*I*a**3*d**2*exp(2*I*c)*exp(2*I*d*x))
/(24576*d**3), Ne(24576*d**3, 0)), (x*(a**3*exp(6*I*c)/8 + 3*a**3*exp(4*I*c
)/8 + 3*a**3*exp(2*I*c)/8), True))
```

3.44 $\int \cos^8(c+dx)(a+ia\tan(c+dx))^3\,dx$

Optimal. Leaf size=144

$$-\frac{ia^7}{16d(a-ia\tan(c+dx))^4}-\frac{ia^6}{12d(a-ia\tan(c+dx))^3}-\frac{3ia^5}{32d(a-ia\tan(c+dx))^2}-\frac{ia^4}{8d(a-ia\tan(c+dx))}+\frac{}{32d(a}$$

```
[Out] 5/32*a^3*x-1/16*I*a^7/d/(a-I*a*tan(d*x+c))^4-1/12*I*a^6/d/(a-I*a*tan(d*x+c)
)^3-3/32*I*a^5/d/(a-I*a*tan(d*x+c))^2-1/8*I*a^4/d/(a-I*a*tan(d*x+c))+1/32*I
*a^4/d/(a+I*a*tan(d*x+c))
```

Rubi [A] time = 0.09, antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {3487, 44, 206}

$$-\frac{ia^7}{16d(a-ia\tan(c+dx))^4}-\frac{ia^6}{12d(a-ia\tan(c+dx))^3}-\frac{3ia^5}{32d(a-ia\tan(c+dx))^2}-\frac{ia^4}{8d(a-ia\tan(c+dx))}+\frac{}{32d(a}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^8*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (5*a^3*x)/32 - ((I/16)*a^7)/(d*(a - I*a*Tan[c + d*x])^4) - ((I/12)*a^6)/(d*
(a - I*a*Tan[c + d*x])^3) - (((3*I)/32)*a^5)/(d*(a - I*a*Tan[c + d*x])^2) -
 ((I/8)*a^4)/(d*(a - I*a*Tan[c + d*x])) + ((I/32)*a^4)/(d*(a + I*a*Tan[c +
d*x]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 206

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^8(c+dx)(a+ia\tan(c+dx))^3\,dx = -\frac{(ia^9)\,\mathrm{Subst}\left(\int \frac{1}{(a-x)^5(a+x)^2}\,dx, x, ia\tan(c+dx)\right)}{d}$$
$$= -\frac{(ia^9)\,\mathrm{Subst}\left(\int \left(\frac{1}{4a^2(a-x)^5} + \frac{1}{4a^3(a-x)^4} + \frac{3}{16a^4(a-x)^3} + \frac{1}{8a^5(a-x)^2} + \frac{1}{32a^5(a+x)^2}\right.\right.}{d}$$
$$= -\frac{ia^7}{16d(a-ia\tan(c+dx))^4} - \frac{ia^6}{12d(a-ia\tan(c+dx))^3} - \frac{3ia^5}{32d(a-ia\tan(}$$
$$= \frac{5a^3x}{32} - \frac{ia^7}{16d(a-ia\tan(c+dx))^4} - \frac{ia^6}{12d(a-ia\tan(c+dx))^3} - \frac{}{32d(a-i}$$

Mathematica [A] time = 0.74, size = 131, normalized size = 0.91

$$\frac{a^3(-60\sin(c+dx) - 120idx\sin(3(c+dx)) + 20\sin(3(c+dx)) + 15\sin(5(c+dx)) - 180i\cos(c+dx) + 20(6dx -}{768d(\cos(dx)+i\sin(dx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^8*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (a^3*((-180*I)*Cos[c + d*x] + 20*(-I + 6*d*x)*Cos[3*(c + d*x)] + (9*I)*Cos[
5*(c + d*x)] - 60*Sin[c + d*x] + 20*Sin[3*(c + d*x)] - (120*I)*d*x*Sin[3*(c
 + d*x)] + 15*Sin[5*(c + d*x)])*(Cos[3*(c + 2*d*x)] + I*Sin[3*(c + 2*d*x)])
)/(768*d*(Cos[d*x] + I*Sin[d*x])^3)
```

fricas [A] time = 0.59, size = 92, normalized size = 0.64

$$\frac{\left(120\,a^3dxe^{(2i\,dx+2i\,c)} - 3i\,a^3e^{(10i\,dx+10i\,c)} - 20i\,a^3e^{(8i\,dx+8i\,c)} - 60i\,a^3e^{(6i\,dx+6i\,c)} - 120i\,a^3e^{(4i\,dx+4i\,c)} + 12i\,a^3\right)e^{(-2i\,dx-2i\,c)}}{768\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^8*(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/768*(120*a^3*d*x*e^(2*I*d*x + 2*I*c) - 3*I*a^3*e^(10*I*d*x + 10*I*c) - 20
*I*a^3*e^(8*I*d*x + 8*I*c) - 60*I*a^3*e^(6*I*d*x + 6*I*c) - 120*I*a^3*e^(4*
I*d*x + 4*I*c) + 12*I*a^3)*e^(-2*I*d*x - 2*I*c)/d
```

giac [B] time = 2.95, size = 514, normalized size = 3.57

$$\frac{480\,a^3dxe^{(10i\,dx+6i\,c)} + 1920\,a^3dxe^{(8i\,dx+4i\,c)} + 2880\,a^3dxe^{(6i\,dx+2i\,c)} + 480\,a^3dxe^{(2i\,dx-2i\,c)} + 1920\,a^3dxe^{(4i\,dx)} - 66i\,a^3e}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^8*(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/3072*(480*a^3*d*x*e^(10*I*d*x + 6*I*c) + 1920*a^3*d*x*e^(8*I*d*x + 4*I*c)
 + 2880*a^3*d*x*e^(6*I*d*x + 2*I*c) + 480*a^3*d*x*e^(2*I*d*x - 2*I*c) + 192
0*a^3*d*x*e^(4*I*d*x) - 66*I*a^3*e^(10*I*d*x + 6*I*c)*log(e^(2*I*d*x + 2*I*
c) + 1) - 264*I*a^3*e^(8*I*d*x + 4*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 396*
I*a^3*e^(6*I*d*x + 2*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 66*I*a^3*e^(2*I*d*
x - 2*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 264*I*a^3*e^(4*I*d*x)*log(e^(2*I*
d*x + 2*I*c) + 1) + 66*I*a^3*e^(10*I*d*x + 6*I*c)*log(e^(2*I*d*x) + e^(-2*I
*c)) + 264*I*a^3*e^(8*I*d*x + 4*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 396*I*
a^3*e^(6*I*d*x + 2*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 66*I*a^3*e^(2*I*d*x
```

```
 - 2*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 264*I*a^3*e^(4*I*d*x)*log(e^(2*I*
d*x) + e^(-2*I*c)) - 12*I*a^3*e^(18*I*d*x + 14*I*c) - 128*I*a^3*e^(16*I*d*x
 + 12*I*c) - 632*I*a^3*e^(14*I*d*x + 10*I*c) - 1968*I*a^3*e^(12*I*d*x + 8*I
*c) - 3692*I*a^3*e^(10*I*d*x + 6*I*c) - 3872*I*a^3*e^(8*I*d*x + 4*I*c) - 19
68*I*a^3*e^(6*I*d*x + 2*I*c) + 192*I*a^3*e^(2*I*d*x - 2*I*c) - 192*I*a^3*e^
(4*I*d*x) + 48*I*a^3*e^(-4*I*c))/(d*e^(10*I*d*x + 6*I*c) + 4*d*e^(8*I*d*x +
 4*I*c) + 6*d*e^(6*I*d*x + 2*I*c) + d*e^(2*I*d*x - 2*I*c) + 4*d*e^(4*I*d*x)
)
```

maple [A] time = 0.52, size = 176, normalized size = 1.22

$$\frac{-ia^3\left(-\frac{(\sin^2(dx+c))(\cos^6(dx+c))}{8}-\frac{(\cos^6(dx+c))}{24}\right)-3a^3\left(-\frac{\sin(dx+c)(\cos^7(dx+c))}{8}+\frac{\left(\cos^5(dx+c)+\frac{5(\cos^3(dx+c))}{4}+\frac{15\cos(dx+c)}{8}\right)\sin(dx+c)}{48}\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^8*(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(-I*a^3*(-1/8*sin(d*x+c)^2*cos(d*x+c)^6-1/24*cos(d*x+c)^6)-3*a^3*(-1/8*
sin(d*x+c)*cos(d*x+c)^7+1/48*(cos(d*x+c)^5+5/4*cos(d*x+c)^3+15/8*cos(d*x+c)
)*sin(d*x+c)+5/128*d*x+5/128*c)-3/8*I*a^3*cos(d*x+c)^8+a^3*(1/8*(cos(d*x+c)
^7+7/6*cos(d*x+c)^5+35/24*cos(d*x+c)^3+35/16*cos(d*x+c))*sin(d*x+c)+35/128*
d*x+35/128*c))
```

maxima [A] time = 0.52, size = 128, normalized size = 0.89

$$\frac{60\,(dx+c)a^3+\frac{60\,a^3\tan(dx+c)^7+220\,a^3\tan(dx+c)^5+292\,a^3\tan(dx+c)^3+64i\,a^3\tan(dx+c)^2+324\,a^3\tan(dx+c)-128i\,a^3}{\tan(dx+c)^8+4\,\tan(dx+c)^6+6\,\tan(dx+c)^4+4\,\tan(dx+c)^2+1}}{384\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^8*(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/384*(60*(d*x + c)*a^3 + (60*a^3*tan(d*x + c)^7 + 220*a^3*tan(d*x + c)^5 +
 292*a^3*tan(d*x + c)^3 + 64*I*a^3*tan(d*x + c)^2 + 324*a^3*tan(d*x + c) -
128*I*a^3)/(tan(d*x + c)^8 + 4*tan(d*x + c)^6 + 6*tan(d*x + c)^4 + 4*tan(d*
x + c)^2 + 1))/d
```

mupad [B] time = 3.65, size = 125, normalized size = 0.87

$$\frac{5\,a^3\,x}{32}-\frac{\frac{5\,a^3\,\tan(c+d\,x)^4}{32}+\frac{a^3\,\tan(c+d\,x)^3\,15\mathrm{i}}{32}-\frac{35\,a^3\,\tan(c+d\,x)^2}{96}+\frac{a^3\,\tan(c+d\,x)\,5\mathrm{i}}{32}-\frac{a^3}{3}}{d\,\left(-\tan\left(c+d\,x\right)^5-\tan\left(c+d\,x\right)^4\,3\mathrm{i}+2\,\tan\left(c+d\,x\right)^3-\tan\left(c+d\,x\right)^2\,2\mathrm{i}+3\,\tan\left(c+d\,x\right)+1\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^8*(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] (5*a^3*x)/32 - ((a^3*tan(c + d*x)*5i)/32 - a^3/3 - (35*a^3*tan(c + d*x)^2)/
96 + (a^3*tan(c + d*x)^3*15i)/32 + (5*a^3*tan(c + d*x)^4)/32)/(d*(3*tan(c +
 d*x) - tan(c + d*x)^2*2i + 2*tan(c + d*x)^3 - tan(c + d*x)^4*3i - tan(c +
d*x)^5 + 1i))
```

sympy [A] time = 0.57, size = 230, normalized size = 1.60

$$\frac{5a^3x}{32}+\begin{cases}-\frac{\left(25165824ia^3d^4e^{10ic}e^{8idx}+167772160ia^3d^4e^{8ic}e^{6idx}+503316480ia^3d^4e^{6ic}e^{4idx}+1006632960ia^3d^4e^{4ic}e^{2idx}-100663296ia^3d^4e^{-2idx}\right)e^{-2ic}}{6442450944d^5} \\ x\left(-\frac{5a^3}{32}+\frac{\left(a^3e^{10ic}+5a^3e^{8ic}+10a^3e^{6ic}+10a^3e^{4ic}+5a^3e^{2ic}+a^3\right)e^{-2ic}}{32}\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**8*(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] 5*a**3*x/32 + Piecewise((-(25165824*I*a**3*d**4*exp(10*I*c)*exp(8*I*d*x) +
167772160*I*a**3*d**4*exp(8*I*c)*exp(6*I*d*x) + 503316480*I*a**3*d**4*exp(6
*I*c)*exp(4*I*d*x) + 1006632960*I*a**3*d**4*exp(4*I*c)*exp(2*I*d*x) - 10066
3296*I*a**3*d**4*exp(-2*I*d*x))*exp(-2*I*c)/(6442450944*d**5), Ne(644245094
4*d**5*exp(2*I*c), 0)), (x*(-5*a**3/32 + (a**3*exp(10*I*c) + 5*a**3*exp(8*I
*c) + 10*a**3*exp(6*I*c) + 10*a**3*exp(4*I*c) + 5*a**3*exp(2*I*c) + a**3)*e
xp(-2*I*c)/32), True))
```

3.45 $\int \sec^3(c+dx)(a+ia\tan(c+dx))^3\,dx$

Optimal. Leaf size=127

$$\frac{7ia^3\sec^3(c+dx)}{12d}+\frac{7a^3\tanh^{-1}(\sin(c+dx))}{8d}+\frac{7i\sec^3(c+dx)\left(a^3+ia^3\tan(c+dx)\right)}{20d}+\frac{7a^3\tan(c+dx)\sec(c+dx)}{8d}$$

```
[Out] 7/8*a^3*arctanh(sin(d*x+c))/d+7/12*I*a^3*sec(d*x+c)^3/d+7/8*a^3*sec(d*x+c)*
tan(d*x+c)/d+1/5*I*a*sec(d*x+c)^3*(a+I*a*tan(d*x+c))^2/d+7/20*I*sec(d*x+c)^
3*(a^3+I*a^3*tan(d*x+c))/d
```

Rubi [A] time = 0.12, antiderivative size = 127, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {3498, 3486, 3768, 3770}

$$\frac{7ia^3\sec^3(c+dx)}{12d}+\frac{7a^3\tanh^{-1}(\sin(c+dx))}{8d}+\frac{7i\sec^3(c+dx)\left(a^3+ia^3\tan(c+dx)\right)}{20d}+\frac{7a^3\tan(c+dx)\sec(c+dx)}{8d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (7*a^3*ArcTanh[Sin[c + d*x]])/(8*d) + (((7*I)/12)*a^3*Sec[c + d*x]^3)/d + (
7*a^3*Sec[c + d*x]*Tan[c + d*x])/(8*d) + ((I/5)*a*Sec[c + d*x]^3*(a + I*a*T
an[c + d*x])^2)/d + (((7*I)/20)*Sec[c + d*x]^3*(a^3 + I*a^3*Tan[c + d*x]))/
d
```

Rule 3486

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

Rule 3498

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

Rule 3768

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \sec^3(c+dx)(a+ia\tan(c+dx))^3\,dx = \frac{ia\sec^3(c+dx)(a+ia\tan(c+dx))^2}{5d} + \frac{1}{5}(7a)\int \sec^3(c+dx)(a+ia\tan($$
$$= \frac{ia\sec^3(c+dx)(a+ia\tan(c+dx))^2}{5d} + \frac{7i\sec^3(c+dx)\left(a^3+ia^3\tan(c+\right.}{20d}$$
$$= \frac{7ia^3\sec^3(c+dx)}{12d} + \frac{ia\sec^3(c+dx)(a+ia\tan(c+dx))^2}{5d} + \frac{7i\sec^3(c+d}{}$$
$$= \frac{7ia^3\sec^3(c+dx)}{12d} + \frac{7a^3\sec(c+dx)\tan(c+dx)}{8d} + \frac{ia\sec^3(c+dx)(a+i}{5d}$$
$$= \frac{7a^3\tanh^{-1}(\sin(c+dx))}{8d} + \frac{7ia^3\sec^3(c+dx)}{12d} + \frac{7a^3\sec(c+dx)\tan(c+}{8d}$$

Mathematica [A] time = 0.85, size = 102, normalized size = 0.80

$$\frac{a^3(\cos(3dx)+i\sin(3dx))\left(1680\tanh^{-1}\left(\cos(c)\tan\left(\frac{dx}{2}\right)+\sin(c)\right)+\sec^5(c+dx)(-150\sin(2(c+dx))+105\sin(4\right.}{960d(\cos(dx)+i\sin(dx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^3*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (a^3*(Cos[3*d*x] + I*Sin[3*d*x])*(1680*ArcTanh[Sin[c] + Cos[c]*Tan[(d*x)/2]
] + Sec[c + d*x]^5*(448*I + (640*I)*Cos[2*(c + d*x)] - 150*Sin[2*(c + d*x)]
 + 105*Sin[4*(c + d*x)])))/(960*d*(Cos[d*x] + I*Sin[d*x])^3)
```

fricas [B] time = 0.61, size = 310, normalized size = 2.44

$$\frac{-210i\,a^3e^{(9i\,dx+9i\,c)}+1580i\,a^3e^{(7i\,dx+7i\,c)}+1792i\,a^3e^{(5i\,dx+5i\,c)}+980i\,a^3e^{(3i\,dx+3i\,c)}+210i\,a^3e^{(i\,dx+i\,c)}+105\left(a^3e^{(10i\,dx+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/120*(-210*I*a^3*e^(9*I*d*x + 9*I*c) + 1580*I*a^3*e^(7*I*d*x + 7*I*c) + 17
92*I*a^3*e^(5*I*d*x + 5*I*c) + 980*I*a^3*e^(3*I*d*x + 3*I*c) + 210*I*a^3*e^
(I*d*x + I*c) + 105*(a^3*e^(10*I*d*x + 10*I*c) + 5*a^3*e^(8*I*d*x + 8*I*c)
+ 10*a^3*e^(6*I*d*x + 6*I*c) + 10*a^3*e^(4*I*d*x + 4*I*c) + 5*a^3*e^(2*I*d*
x + 2*I*c) + a^3)*log(e^(I*d*x + I*c) + I) - 105*(a^3*e^(10*I*d*x + 10*I*c)
 + 5*a^3*e^(8*I*d*x + 8*I*c) + 10*a^3*e^(6*I*d*x + 6*I*c) + 10*a^3*e^(4*I*d
*x + 4*I*c) + 5*a^3*e^(2*I*d*x + 2*I*c) + a^3)*log(e^(I*d*x + I*c) - I))/(d
*e^(10*I*d*x + 10*I*c) + 5*d*e^(8*I*d*x + 8*I*c) + 10*d*e^(6*I*d*x + 6*I*c)
 + 10*d*e^(4*I*d*x + 4*I*c) + 5*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [A] time = 1.08, size = 189, normalized size = 1.49

$$\frac{105\,a^3\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)-105\,a^3\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)+\frac{2\left(15\,a^3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^9-360i\,a^3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^8-390\,a^3\right.}{}}{120}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/120*(105*a^3*log(tan(1/2*d*x + 1/2*c) + 1) - 105*a^3*log(tan(1/2*d*x + 1/
2*c) - 1) + 2*(15*a^3*tan(1/2*d*x + 1/2*c)^9 - 360*I*a^3*tan(1/2*d*x + 1/2*
```

```
c)^8 - 390*a^3*tan(1/2*d*x + 1/2*c)^7 + 960*I*a^3*tan(1/2*d*x + 1/2*c)^6 -
400*I*a^3*tan(1/2*d*x + 1/2*c)^4 + 390*a^3*tan(1/2*d*x + 1/2*c)^3 + 320*I*a
^3*tan(1/2*d*x + 1/2*c)^2 - 15*a^3*tan(1/2*d*x + 1/2*c) - 136*I*a^3)/(tan(1
/2*d*x + 1/2*c)^2 - 1)^5)/d
```

maple [B] time = 0.53, size = 236, normalized size = 1.86

$$-\frac{ia^3\left(\sin^4(dx+c)\right)}{5d\cos(dx+c)^5}-\frac{ia^3\left(\sin^4(dx+c)\right)}{15d\cos(dx+c)^3}+\frac{ia^3\left(\sin^4(dx+c)\right)}{15d\cos(dx+c)}+\frac{ia^3\left(\sin^2(dx+c)\right)\cos(dx+c)}{15d}+\frac{2ia^3\cos(dx+c}{15d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] -1/5*I/d*a^3*sin(d*x+c)^4/cos(d*x+c)^5-1/15*I/d*a^3*sin(d*x+c)^4/cos(d*x+c)
^3+1/15*I/d*a^3*sin(d*x+c)^4/cos(d*x+c)+1/15*I/d*a^3*sin(d*x+c)^2*cos(d*x+c
)+2/15*I/d*a^3*cos(d*x+c)-3/4/d*a^3*sin(d*x+c)^3/cos(d*x+c)^4-3/8/d*a^3*sin
(d*x+c)^3/cos(d*x+c)^2-3/8*a^3*sin(d*x+c)/d+7/8/d*a^3*ln(sec(d*x+c)+tan(d*x
+c))+I/d*a^3/cos(d*x+c)^3+1/2*a^3*sec(d*x+c)*tan(d*x+c)/d
```

maxima [A] time = 0.75, size = 155, normalized size = 1.22

$$-\frac{45\,a^3\left(\frac{2\left(\sin(dx+c)^3+\sin(dx+c)\right)}{\sin(dx+c)^4-2\,\sin(dx+c)^2+1}-\log\left(\sin(dx+c)+1\right)+\log\left(\sin(dx+c)-1\right)\right)+60\,a^3\left(\frac{2\,\sin(dx+c)}{\sin(dx+c)^2-1}-\log\left(\sin\left(\right.\right.\right.}{240\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/240*(45*a^3*(2*(sin(d*x + c)^3 + sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(d
*x + c)^2 + 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)) + 60*a^3*(2
*sin(d*x + c)/(sin(d*x + c)^2 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x +
c) - 1)) - 240*I*a^3/cos(d*x + c)^3 - 16*I*(5*cos(d*x + c)^2 - 3)*a^3/cos(d
*x + c)^5)/d
```

mupad [B] time = 6.98, size = 228, normalized size = 1.80

$$\frac{7\,a^3\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{4\,d}-\frac{-\frac{a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9}{4}+a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8 6i+\frac{13\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{2}-a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6 16i+\frac{a^3\,\mathrm{ta}}{}}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}-5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8+10\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^3/cos(c + d*x)^3,x)
```

```
[Out] (7*a^3*atanh(tan(c/2 + (d*x)/2)))/(4*d) - ((a^3*tan(c/2 + (d*x)/2)^4*20i)/3
 - (13*a^3*tan(c/2 + (d*x)/2)^3)/2 - (a^3*tan(c/2 + (d*x)/2)^2*16i)/3 - a^3
*tan(c/2 + (d*x)/2)^6*16i + (13*a^3*tan(c/2 + (d*x)/2)^7)/2 + a^3*tan(c/2 +
 (d*x)/2)^8*6i - (a^3*tan(c/2 + (d*x)/2)^9)/4 + (a^3*34i)/15 + (a^3*tan(c/2
 + (d*x)/2))/4)/(d*(5*tan(c/2 + (d*x)/2)^2 - 10*tan(c/2 + (d*x)/2)^4 + 10*t
an(c/2 + (d*x)/2)^6 - 5*tan(c/2 + (d*x)/2)^8 + tan(c/2 + (d*x)/2)^10 - 1))
```

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

$$-ia^3\left(\int i\sec^3(c+dx)\,dx+\int\left(-3\tan(c+dx)\sec^3(c+dx)\right)dx+\int\tan^3(c+dx)\sec^3(c+dx)\,dx+\int\left(-3i\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3*(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] -I*a**3*(Integral(I*sec(c + d*x)**3, x) + Integral(-3*tan(c + d*x)*sec(c +
d*x)**3, x) + Integral(tan(c + d*x)**3*sec(c + d*x)**3, x) + Integral(-3*I*
tan(c + d*x)**2*sec(c + d*x)**3, x))
```

3.46 $\int \sec(c+dx)(a+ia\tan(c+dx))^3\,dx$

Optimal. Leaf size=99

$$\frac{5ia^3\sec(c+dx)}{2d}+\frac{5a^3\tanh^{-1}(\sin(c+dx))}{2d}+\frac{5i\sec(c+dx)\left(a^3+ia^3\tan(c+dx)\right)}{6d}+\frac{ia\sec(c+dx)(a+ia\tan(c+}{3d}$$

```
[Out] 5/2*a^3*arctanh(sin(d*x+c))/d+5/2*I*a^3*sec(d*x+c)/d+1/3*I*a*sec(d*x+c)*(a+
I*a*tan(d*x+c))^2/d+5/6*I*sec(d*x+c)*(a^3+I*a^3*tan(d*x+c))/d
```

Rubi [A] time = 0.07, antiderivative size = 99, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {3498, 3486, 3770}

$$\frac{5ia^3\sec(c+dx)}{2d}+\frac{5a^3\tanh^{-1}(\sin(c+dx))}{2d}+\frac{5i\sec(c+dx)\left(a^3+ia^3\tan(c+dx)\right)}{6d}+\frac{ia\sec(c+dx)(a+ia\tan(c+}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (5*a^3*ArcTanh[Sin[c + d*x]])/(2*d) + (((5*I)/2)*a^3*Sec[c + d*x])/d + ((I/
3)*a*Sec[c + d*x]*(a + I*a*Tan[c + d*x])^2)/d + (((5*I)/6)*Sec[c + d*x]*(a^
3 + I*a^3*Tan[c + d*x]))/d
```

Rule 3486

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

Rule 3498

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\int \sec(c+dx)(a+ia\tan(c+dx))^3\,dx &= \frac{ia\sec(c+dx)(a+ia\tan(c+dx))^2}{3d}+\frac{1}{3}(5a)\int \sec(c+dx)(a+ia\tan(\\
&= \frac{ia\sec(c+dx)(a+ia\tan(c+dx))^2}{3d}+\frac{5i\sec(c+dx)\left(a^3+ia^3\tan(c+\right.}{6d}\\
&= \frac{5ia^3\sec(c+dx)}{2d}+\frac{ia\sec(c+dx)(a+ia\tan(c+dx))^2}{3d}+\frac{5i\sec(c+dx}{}\\
&= \frac{5a^3\tanh^{-1}(\sin(c+dx))}{2d}+\frac{5ia^3\sec(c+dx)}{2d}+\frac{ia\sec(c+dx)(a+ia\,\mathrm{ta}}{3d}
\end{aligned}$$

Mathematica [A] time = 0.62, size = 93, normalized size = 0.94

$$\frac{a^3(\cos(3dx)+i\sin(3dx))\left(60\tanh^{-1}\left(\cos(c)\tan\left(\frac{dx}{2}\right)+\sin(c)\right)+i\sec^3(c+dx)(9i\sin(2(c+dx))+24\cos(2(c+\ldots\right.}{12d(\cos(dx)+i\sin(dx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (a^3*(Cos[3*d*x] + I*Sin[3*d*x])*(60*ArcTanh[Sin[c] + Cos[c]*Tan[(d*x)/2]]
+ I*Sec[c + d*x]^3*(20 + 24*Cos[2*(c + d*x)] + (9*I)*Sin[2*(c + d*x)])))/(1
2*d*(Cos[d*x] + I*Sin[d*x])^3)
```

fricas [B] time = 0.54, size = 202, normalized size = 2.04

$$\frac{66i\,a^3e^{(5i\,dx+5i\,c)}+80i\,a^3e^{(3i\,dx+3i\,c)}+30i\,a^3e^{(i\,dx+i\,c)}+15\left(a^3e^{(6i\,dx+6i\,c)}+3\,a^3e^{(4i\,dx+4i\,c)}+3\,a^3e^{(2i\,dx+2i\,c)}+a^3\right)\log\left(e\ldots\right.}{6\left(de^{(6i\,dx+6i\,c)}+3\,de^{(4i\,dx+4i\,c)}+3\,de^{(2i\,d\ldots}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/6*(66*I*a^3*e^(5*I*d*x + 5*I*c) + 80*I*a^3*e^(3*I*d*x + 3*I*c) + 30*I*a^3
*e^(I*d*x + I*c) + 15*(a^3*e^(6*I*d*x + 6*I*c) + 3*a^3*e^(4*I*d*x + 4*I*c)
+ 3*a^3*e^(2*I*d*x + 2*I*c) + a^3)*log(e^(I*d*x + I*c) + I) - 15*(a^3*e^(6*
I*d*x + 6*I*c) + 3*a^3*e^(4*I*d*x + 4*I*c) + 3*a^3*e^(2*I*d*x + 2*I*c) + a^
3)*log(e^(I*d*x + I*c) - I))/(d*e^(6*I*d*x + 6*I*c) + 3*d*e^(4*I*d*x + 4*I*
c) + 3*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [A] time = 1.14, size = 125, normalized size = 1.26

$$\frac{15\,a^3\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)-15\,a^3\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)-\frac{2\left(9\,a^3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5+18i\,a^3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^4-48i\,a^3\tan\left(\frac{1}{2}\ldots\right.\right.}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)\ldots}}{6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/6*(15*a^3*log(tan(1/2*d*x + 1/2*c) + 1) - 15*a^3*log(tan(1/2*d*x + 1/2*c)
 - 1) - 2*(9*a^3*tan(1/2*d*x + 1/2*c)^5 + 18*I*a^3*tan(1/2*d*x + 1/2*c)^4 -
 48*I*a^3*tan(1/2*d*x + 1/2*c)^2 - 9*a^3*tan(1/2*d*x + 1/2*c) + 22*I*a^3)/(
tan(1/2*d*x + 1/2*c)^2 - 1)^3)/d
```

maple [A] time = 0.27, size = 167, normalized size = 1.69

$$-\frac{ia^3\left(\sin^4(dx+c)\right)}{3d\cos(dx+c)^3}+\frac{ia^3\left(\sin^4(dx+c)\right)}{3d\cos(dx+c)}+\frac{ia^3\left(\sin^2(dx+c)\right)\cos(dx+c)}{3d}+\frac{2ia^3\cos(dx+c)}{3d}-\frac{3a^3\left(\sin^3(dx+c)\right)}{2d\cos(dx+c)^2}-\ldots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)*(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] -1/3*I/d*a^3*sin(d*x+c)^4/cos(d*x+c)^3+1/3*I/d*a^3*sin(d*x+c)^4/cos(d*x+c)+
1/3*I/d*a^3*cos(d*x+c)*sin(d*x+c)^2+2/3*I/d*a^3*cos(d*x+c)-3/2/d*a^3*sin(d*
x+c)^3/cos(d*x+c)^2-3/2*a^3*sin(d*x+c)/d+5/2/d*a^3*ln(sec(d*x+c)+tan(d*x+c)
)+3*I/d*a^3/cos(d*x+c)
```

maxima [A] time = 0.42, size = 109, normalized size = 1.10

$$\frac{9\,a^3\left(\frac{2\,\sin(dx+c)}{\sin(dx+c)^2-1} + \log\left(\sin\left(dx+c\right)+1\right) - \log\left(\sin\left(dx+c\right)-1\right)\right) + 12\,a^3\log\left(\sec\left(dx+c\right)+\tan\left(dx+c\right)\right) + \frac{3}{\cos}}{12\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/12*(9*a^3*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) + log(sin(d*x + c) + 1) -
log(sin(d*x + c) - 1)) + 12*a^3*log(sec(d*x + c) + tan(d*x + c)) + 36*I*a^3
/cos(d*x + c) + 4*I*(3*cos(d*x + c)^2 - 1)*a^3/cos(d*x + c)^3)/d
```

mupad [B] time = 5.23, size = 136, normalized size = 1.37

$$\frac{5\,a^3\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d} - \frac{3\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5 + a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4 6\mathrm{i} - a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2 16\mathrm{i} - 3\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6 - 3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4 + 3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2 - 1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^3/cos(c + d*x),x)
```

```
[Out] (5*a^3*atanh(tan(c/2 + (d*x)/2)))/d - (a^3*tan(c/2 + (d*x)/2)^4*6i - a^3*ta
n(c/2 + (d*x)/2)^2*16i + 3*a^3*tan(c/2 + (d*x)/2)^5 + (a^3*22i)/3 - 3*a^3*t
an(c/2 + (d*x)/2))/(d*(3*tan(c/2 + (d*x)/2)^2 - 3*tan(c/2 + (d*x)/2)^4 + ta
n(c/2 + (d*x)/2)^6 - 1))
```

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

$$-ia^3\left(\int i\sec\left(c+dx\right)dx + \int\left(-3\tan\left(c+dx\right)\sec\left(c+dx\right)\right)dx + \int\tan^3\left(c+dx\right)\sec\left(c+dx\right)dx + \int\left(-3i\tan\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] -I*a**3*(Integral(I*sec(c + d*x), x) + Integral(-3*tan(c + d*x)*sec(c + d*x
), x) + Integral(tan(c + d*x)**3*sec(c + d*x), x) + Integral(-3*I*tan(c + d
*x)**2*sec(c + d*x), x))
```

3.47 $\int \cos(c+dx)(a+ia\tan(c+dx))^3\,dx$

Optimal. Leaf size=61

$$-\frac{3ia^3\sec(c+dx)}{d}-\frac{3a^3\tanh^{-1}(\sin(c+dx))}{d}-\frac{2ia\cos(c+dx)(a+ia\tan(c+dx))^2}{d}$$

```
[Out] -3*a^3*arctanh(sin(d*x+c))/d-3*I*a^3*sec(d*x+c)/d-2*I*a*cos(d*x+c)*(a+I*a*t
an(d*x+c))^2/d
```

Rubi [A] time = 0.05, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {3496, 3486, 3770}

$$-\frac{3ia^3\sec(c+dx)}{d}-\frac{3a^3\tanh^{-1}(\sin(c+dx))}{d}-\frac{2ia\cos(c+dx)(a+ia\tan(c+dx))^2}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (-3*a^3*ArcTanh[Sin[c + d*x]])/d - ((3*I)*a^3*Sec[c + d*x])/d - ((2*I)*a*Co
s[c + d*x]*(a + I*a*Tan[c + d*x])^2)/d
```

Rule 3486

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

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\int \cos(c+dx)(a+ia\tan(c+dx))^3\,dx &= -\frac{2ia\cos(c+dx)(a+ia\tan(c+dx))^2}{d}-\left(3a^2\right)\int \sec(c+dx)(a+ia\tan(c\\ &= -\frac{3ia^3\sec(c+dx)}{d}-\frac{2ia\cos(c+dx)(a+ia\tan(c+dx))^2}{d}-\left(3a^3\right)\int \sec(\\ &= -\frac{3a^3\tanh^{-1}(\sin(c+dx))}{d}-\frac{3ia^3\sec(c+dx)}{d}-\frac{2ia\cos(c+dx)(a+ia\tan}{d}\end{aligned}$$

Mathematica [B] time = 0.82, size = 123, normalized size = 2.02

$$\frac{a^3\cos^2(c+dx)(\tan(c+dx)-i)^3\left((-\cos(2c-dx)+i\sin(2c-dx))(5\cos(c+dx)-i\sin(c+dx))+6(\sin(3c)+\right.}{d(\cos(dx)+i\sin(dx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (a^3*Cos[c + d*x]^2*(6*ArcTanh[Sin[c] + Cos[c]*Tan[(d*x)/2]]*Cos[c + d*x]*(
I*Cos[3*c] + Sin[3*c]) + (-Cos[2*c - d*x] + I*Sin[2*c - d*x])*(5*Cos[c + d*
x] - I*Sin[c + d*x]))*(-I + Tan[c + d*x])^3)/(d*(Cos[d*x] + I*Sin[d*x])^3)
```

fricas [A] time = 0.55, size = 107, normalized size = 1.75

$$\frac{-4i\,a^3e^{(3i\,dx+3i\,c)}-6i\,a^3e^{(i\,dx+i\,c)}-3\left(a^3e^{(2i\,dx+2i\,c)}+a^3\right)\log\left(e^{(i\,dx+i\,c)}+i\right)+3\left(a^3e^{(2i\,dx+2i\,c)}+a^3\right)\log\left(e^{(i\,dx+i\,c)}-\right.}{de^{(2i\,dx+2i\,c)}+d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] (-4*I*a^3*e^(3*I*d*x + 3*I*c) - 6*I*a^3*e^(I*d*x + I*c) - 3*(a^3*e^(2*I*d*x
 + 2*I*c) + a^3)*log(e^(I*d*x + I*c) + I) + 3*(a^3*e^(2*I*d*x + 2*I*c) + a^
3)*log(e^(I*d*x + I*c) - I))/(d*e^(2*I*d*x + 2*I*c) + d)
```

giac [B] time = 3.83, size = 234, normalized size = 3.84

$$\frac{63\,a^3e^{(2i\,dx+2i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}+1\right)-33\,a^3e^{(2i\,dx+2i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}-1\right)-63\,a^3e^{(2i\,dx+2i\,c)}\log\left(-i\,e^{(i\,dx+i\,c)}+1\right)+}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/32*(63*a^3*e^(2*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) + 1) - 33*a^3*e^(2*I
*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) - 1) - 63*a^3*e^(2*I*d*x + 2*I*c)*log(-
I*e^(I*d*x + I*c) + 1) + 33*a^3*e^(2*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c)
- 1) - 128*I*a^3*e^(3*I*d*x + 3*I*c) - 192*I*a^3*e^(I*d*x + I*c) + 63*a^3*l
og(I*e^(I*d*x + I*c) + 1) - 33*a^3*log(I*e^(I*d*x + I*c) - 1) - 63*a^3*log(
-I*e^(I*d*x + I*c) + 1) + 33*a^3*log(-I*e^(I*d*x + I*c) - 1))/(d*e^(2*I*d*x
 + 2*I*c) + d)
```

maple [A] time = 0.37, size = 101, normalized size = 1.66

$$-\frac{ia^3\left(\sin^4(dx+c)\right)}{d\cos(dx+c)}-\frac{ia^3\left(\sin^2(dx+c)\right)\cos(dx+c)}{d}-\frac{5ia^3\cos(dx+c)}{d}+\frac{4a^3\sin(dx+c)}{d}-\frac{3a^3\ln(\sec(dx+c)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)*(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] -I/d*a^3*sin(d*x+c)^4/cos(d*x+c)-I/d*a^3*sin(d*x+c)^2*cos(d*x+c)-5*I/d*a^3*
cos(d*x+c)+4*a^3*sin(d*x+c)/d-3/d*a^3*ln(sec(d*x+c)+tan(d*x+c))
```

maxima [A] time = 0.56, size = 82, normalized size = 1.34

$$-\frac{2i\,a^3\left(\frac{1}{\cos(dx+c)}+\cos(dx+c)\right)+3\,a^3\left(\log(\sin(dx+c)+1)-\log(\sin(dx+c)-1)-2\sin(dx+c)\right)+6i\,a^3\,\mathrm{c}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

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

mupad [B] time = 3.64, size = 102, normalized size = 1.67

$$-\frac{6\,a^3\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d}-\frac{8\,a^3\,{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^2+a^3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,2{}\mathrm{i}-10\,a^3}{d\,\left(-{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^3-{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^2\,1{}\mathrm{i}+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+1{}\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] - (6*a^3*atanh(tan(c/2 + (d*x)/2)))/d - (8*a^3*tan(c/2 + (d*x)/2)^2 - 10*a^
3 + a^3*tan(c/2 + (d*x)/2)*2i)/(d*(tan(c/2 + (d*x)/2) - tan(c/2 + (d*x)/2)^
2*1i - tan(c/2 + (d*x)/2)^3 + 1i))
```

sympy [A] time = 0.36, size = 109, normalized size = 1.79

$$\frac{2ia^3e^{ic}e^{idx}}{-de^{2ic}e^{2idx}-d}+\frac{3a^3\left(\log\left(e^{idx}-ie^{-ic}\right)-\log\left(e^{idx}+ie^{-ic}\right)\right)}{d}+\begin{cases}-\frac{4ia^3e^{ic}e^{idx}}{d} & \text{for}\ d\neq 0\\ 4a^3xe^{ic} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] 2*I*a**3*exp(I*c)*exp(I*d*x)/(-d*exp(2*I*c)*exp(2*I*d*x) - d) + 3*a**3*(log
(exp(I*d*x) - I*exp(-I*c)) - log(exp(I*d*x) + I*exp(-I*c)))/d + Piecewise((
-4*I*a**3*exp(I*c)*exp(I*d*x)/d, Ne(d, 0)), (4*a**3*x*exp(I*c), True))
```

3.48 $\int \cos^3(c+dx)(a+ia\tan(c+dx))^3\,dx$

Optimal. Leaf size=32

$$-\frac{i\cos^3(c+dx)(a+ia\tan(c+dx))^3}{3d}$$

```
[Out] -1/3*I*cos(d*x+c)^3*(a+I*a*tan(d*x+c))^3/d
```

Rubi [A] time = 0.04, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.042, Rules used = {3488}

$$-\frac{i\cos^3(c+dx)(a+ia\tan(c+dx))^3}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] ((-I/3)*Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^3)/d
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rubi steps

$$\int \cos^3(c+dx)(a+ia\tan(c+dx))^3\,dx = -\frac{i\cos^3(c+dx)(a+ia\tan(c+dx))^3}{3d}$$

Mathematica [A] time = 0.09, size = 31, normalized size = 0.97

$$-\frac{ia^3(\cos(c+dx)+i\sin(c+dx))^3}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] ((-1/3*I)*a^3*(Cos[c + d*x] + I*Sin[c + d*x])^3)/d
```

fricas [A] time = 0.46, size = 17, normalized size = 0.53

$$-\frac{i\,a^3e^{(3i\,dx+3i\,c)}}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

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

giac [B] time = 3.99, size = 901, normalized size = 28.16

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -1/384*(108*a^3*e^(8*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 432*a^3*e^
(6*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) + 1) + 432*a^3*e^(2*I*d*x - 2*I*c)*
log(I*e^(I*d*x + I*c) + 1) + 648*a^3*e^(4*I*d*x)*log(I*e^(I*d*x + I*c) + 1)
 + 108*a^3*e^(-4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 111*a^3*e^(8*I*d*x + 4*I
*c)*log(I*e^(I*d*x + I*c) - 1) + 444*a^3*e^(6*I*d*x + 2*I*c)*log(I*e^(I*d*x
 + I*c) - 1) + 444*a^3*e^(2*I*d*x - 2*I*c)*log(I*e^(I*d*x + I*c) - 1) + 666
*a^3*e^(4*I*d*x)*log(I*e^(I*d*x + I*c) - 1) + 111*a^3*e^(-4*I*c)*log(I*e^(I
*d*x + I*c) - 1) - 108*a^3*e^(8*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) + 1)
- 432*a^3*e^(6*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 432*a^3*e^(2*I*
d*x - 2*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 648*a^3*e^(4*I*d*x)*log(-I*e^(I*
d*x + I*c) + 1) - 108*a^3*e^(-4*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 111*a^3*
e^(8*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 444*a^3*e^(6*I*d*x + 2*I*
c)*log(-I*e^(I*d*x + I*c) - 1) - 444*a^3*e^(2*I*d*x - 2*I*c)*log(-I*e^(I*d*
x + I*c) - 1) - 666*a^3*e^(4*I*d*x)*log(-I*e^(I*d*x + I*c) - 1) - 111*a^3*e
^(-4*I*c)*log(-I*e^(I*d*x + I*c) - 1) + 3*a^3*e^(8*I*d*x + 4*I*c)*log(I*e^(
I*d*x) + e^(-I*c)) + 12*a^3*e^(6*I*d*x + 2*I*c)*log(I*e^(I*d*x) + e^(-I*c))
 + 12*a^3*e^(2*I*d*x - 2*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 18*a^3*e^(4*I*d
*x)*log(I*e^(I*d*x) + e^(-I*c)) + 3*a^3*e^(-4*I*c)*log(I*e^(I*d*x) + e^(-I*
c)) - 3*a^3*e^(8*I*d*x + 4*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 12*a^3*e^(6*
I*d*x + 2*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 12*a^3*e^(2*I*d*x - 2*I*c)*lo
g(-I*e^(I*d*x) + e^(-I*c)) - 18*a^3*e^(4*I*d*x)*log(-I*e^(I*d*x) + e^(-I*c)
) - 3*a^3*e^(-4*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 128*I*a^3*e^(11*I*d*x +
 7*I*c) + 512*I*a^3*e^(9*I*d*x + 5*I*c) + 768*I*a^3*e^(7*I*d*x + 3*I*c) + 5
12*I*a^3*e^(5*I*d*x + I*c) + 128*I*a^3*e^(3*I*d*x - I*c))/(d*e^(8*I*d*x + 4
*I*c) + 4*d*e^(6*I*d*x + 2*I*c) + 4*d*e^(2*I*d*x - 2*I*c) + 6*d*e^(4*I*d*x)
 + d*e^(-4*I*c))
```

maple [B] time = 0.46, size = 76, normalized size = 2.38

$$\frac{\frac{ia^3\left(2+\sin^2(dx+c)\right)\cos(dx+c)}{3} - a^3\left(\sin^3(dx+c)\right) - ia^3\left(\cos^3(dx+c)\right) + \frac{a^3\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(1/3*I*a^3*(2+sin(d*x+c)^2)*cos(d*x+c)-a^3*sin(d*x+c)^3-I*a^3*cos(d*x+c
)^3+1/3*a^3*(2+cos(d*x+c)^2)*sin(d*x+c))
```

maxima [B] time = 0.49, size = 75, normalized size = 2.34

$$-\frac{3i\,a^3\cos(dx+c)^3 + 3\,a^3\sin(dx+c)^3 + i\left(\cos(dx+c)^3 - 3\,\cos(dx+c)\right)a^3 + \left(\sin(dx+c)^3 - 3\,\sin(dx+c)\right)a^3}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/3*(3*I*a^3*cos(d*x + c)^3 + 3*a^3*sin(d*x + c)^3 + I*(cos(d*x + c)^3 - 3
*cos(d*x + c))*a^3 + (sin(d*x + c)^3 - 3*sin(d*x + c))*a^3)/d
```

mupad [B] time = 3.33, size = 66, normalized size = 2.06

$$-\frac{2\,a^3\left(3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-1\right)}{3\,d\left(-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2 3\mathrm{i}+3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+1\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^3,x)
```

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

sympy [A] time = 0.24, size = 37, normalized size = 1.16

$$\begin{cases} -\frac{ia^3e^{3ic}e^{3idx}}{3d} & \text{for } 3d \neq 0 \\ a^3xe^{3ic} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3*(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] Piecewise((-I*a**3*exp(3*I*c)*exp(3*I*d*x)/(3*d), Ne(3*d, 0)), (a**3*x*exp(
3*I*c), True))
```

3.49 $\int \cos^5(c+dx)(a+ia\tan(c+dx))^3\,dx$

Optimal. Leaf size=88

$$-\frac{a^3\sin^3(c+dx)}{15d}+\frac{a^3\sin(c+dx)}{5d}-\frac{ia^3\cos^3(c+dx)}{15d}-\frac{2ia\cos^5(c+dx)(a+ia\tan(c+dx))^2}{5d}$$

```
[Out] -1/15*I*a^3*cos(d*x+c)^3/d+1/5*a^3*sin(d*x+c)/d-1/15*a^3*sin(d*x+c)^3/d-2/5
*I*a*cos(d*x+c)^5*(a+I*a*tan(d*x+c))^2/d
```

Rubi [A] time = 0.07, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3496, 3486, 2633}

$$-\frac{a^3\sin^3(c+dx)}{15d}+\frac{a^3\sin(c+dx)}{5d}-\frac{ia^3\cos^3(c+dx)}{15d}-\frac{2ia\cos^5(c+dx)(a+ia\tan(c+dx))^2}{5d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] ((-I/15)*a^3*Cos[c + d*x]^3)/d + (a^3*Sin[c + d*x])/(5*d) - (a^3*Sin[c + d*
x]^3)/(15*d) - (((2*I)/5)*a*Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^2)/d
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3486

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

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rubi steps

$$\begin{aligned}\int \cos^5(c+dx)(a+ia\tan(c+dx))^3\,dx &= -\frac{2ia\cos^5(c+dx)(a+ia\tan(c+dx))^2}{5d}+\frac{1}{5}a^2\int \cos^3(c+dx)(a+ia\tan\\ &= -\frac{ia^3\cos^3(c+dx)}{15d}-\frac{2ia\cos^5(c+dx)(a+ia\tan(c+dx))^2}{5d}+\frac{1}{5}a^3\int \cos\\ &= -\frac{ia^3\cos^3(c+dx)}{15d}-\frac{2ia\cos^5(c+dx)(a+ia\tan(c+dx))^2}{5d}-\frac{a^3\,\text{Subst}\big(\\ &= -\frac{ia^3\cos^3(c+dx)}{15d}+\frac{a^3\sin(c+dx)}{5d}-\frac{a^3\sin^3(c+dx)}{15d}-\frac{2ia\cos^5(c+dx}{}\end{aligned}$$

Mathematica [A] time = 0.61, size = 55, normalized size = 0.62

$$\frac{a^3(-6i\sin(2(c+dx))+9\cos(2(c+dx))+5)(\sin(3(c+dx))-i\cos(3(c+dx)))}{30d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (a^3*(5 + 9*Cos[2*(c + d*x)] - (6*I)*Sin[2*(c + d*x)])*((-I)*Cos[3*(c + d*x
)] + Sin[3*(c + d*x)]))/(30*d)
```

fricas [A] time = 0.44, size = 48, normalized size = 0.55

$$\frac{-3i\,a^3e^{(5i\,dx+5i\,c)}-10i\,a^3e^{(3i\,dx+3i\,c)}-15i\,a^3e^{(i\,dx+i\,c)}}{60\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/60*(-3*I*a^3*e^(5*I*d*x + 5*I*c) - 10*I*a^3*e^(3*I*d*x + 3*I*c) - 15*I*a^
3*e^(I*d*x + I*c))/d
```

giac [B] time = 4.78, size = 929, normalized size = 10.56

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/7680*(1785*a^3*e^(8*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 7140*a^3*
e^(6*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) + 1) + 7140*a^3*e^(2*I*d*x - 2*I*
c)*log(I*e^(I*d*x + I*c) + 1) + 10710*a^3*e^(4*I*d*x)*log(I*e^(I*d*x + I*c)
 + 1) + 1785*a^3*e^(-4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 1530*a^3*e^(8*I*d*
x + 4*I*c)*log(I*e^(I*d*x + I*c) - 1) + 6120*a^3*e^(6*I*d*x + 2*I*c)*log(I*
e^(I*d*x + I*c) - 1) + 6120*a^3*e^(2*I*d*x - 2*I*c)*log(I*e^(I*d*x + I*c) -
 1) + 9180*a^3*e^(4*I*d*x)*log(I*e^(I*d*x + I*c) - 1) + 1530*a^3*e^(-4*I*c)
*log(I*e^(I*d*x + I*c) - 1) - 1785*a^3*e^(8*I*d*x + 4*I*c)*log(-I*e^(I*d*x
+ I*c) + 1) - 7140*a^3*e^(6*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 71
40*a^3*e^(2*I*d*x - 2*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 10710*a^3*e^(4*I*d
*x)*log(-I*e^(I*d*x + I*c) + 1) - 1785*a^3*e^(-4*I*c)*log(-I*e^(I*d*x + I*c
) + 1) - 1530*a^3*e^(8*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 6120*a^
3*e^(6*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 6120*a^3*e^(2*I*d*x - 2
*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 9180*a^3*e^(4*I*d*x)*log(-I*e^(I*d*x +
I*c) - 1) - 1530*a^3*e^(-4*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 255*a^3*e^(8*
I*d*x + 4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 1020*a^3*e^(6*I*d*x + 2*I*c)*l
og(I*e^(I*d*x) + e^(-I*c)) - 1020*a^3*e^(2*I*d*x - 2*I*c)*log(I*e^(I*d*x) +
 e^(-I*c)) - 1530*a^3*e^(4*I*d*x)*log(I*e^(I*d*x) + e^(-I*c)) - 255*a^3*e^(
-4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 255*a^3*e^(8*I*d*x + 4*I*c)*log(-I*e^
(I*d*x) + e^(-I*c)) + 1020*a^3*e^(6*I*d*x + 2*I*c)*log(-I*e^(I*d*x) + e^(-I
*c)) + 1020*a^3*e^(2*I*d*x - 2*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 1530*a^3
*e^(4*I*d*x)*log(-I*e^(I*d*x) + e^(-I*c)) + 255*a^3*e^(-4*I*c)*log(-I*e^(I*
d*x) + e^(-I*c)) - 384*I*a^3*e^(13*I*d*x + 9*I*c) - 2816*I*a^3*e^(11*I*d*x
+ 7*I*c) - 9344*I*a^3*e^(9*I*d*x + 5*I*c) - 16896*I*a^3*e^(7*I*d*x + 3*I*c)
 - 17024*I*a^3*e^(5*I*d*x + I*c) - 8960*I*a^3*e^(3*I*d*x - I*c) - 1920*I*a^
3*e^(I*d*x - 3*I*c))/(d*e^(8*I*d*x + 4*I*c) + 4*d*e^(6*I*d*x + 2*I*c) + 4*d
*e^(2*I*d*x - 2*I*c) + 6*d*e^(4*I*d*x) + d*e^(-4*I*c))
```

maple [A] time = 0.51, size = 126, normalized size = 1.43

$$\frac{-ia^3\left(-\frac{\left(\cos^3(dx+c)\right)\left(\sin^2(dx+c)\right)}{5}-\frac{2\left(\cos^3(dx+c)\right)}{15}\right)-3a^3\left(-\frac{\sin(dx+c)\left(\cos^4(dx+c)\right)}{5}+\frac{\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{15}\right)-\frac{3ia^3\left(\cos^5(dx+c)\right)}{5}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(-I*a^3*(-1/5*cos(d*x+c)^3*sin(d*x+c)^2-2/15*cos(d*x+c)^3)-3*a^3*(-1/5*
sin(d*x+c)*cos(d*x+c)^4+1/15*(2+cos(d*x+c)^2)*sin(d*x+c))-3/5*I*a^3*cos(d*x
+c)^5+1/5*a^3*(8/3+cos(d*x+c)^4+4/3*cos(d*x+c)^2)*sin(d*x+c))
```

maxima [A] time = 0.68, size = 105, normalized size = 1.19

$$-\frac{9i\,a^3\cos(dx+c)^5+i\left(3\cos(dx+c)^5-5\cos(dx+c)^3\right)a^3-3\left(3\sin(dx+c)^5-5\sin(dx+c)^3\right)a^3-\left(3\sin(dx\right.}{15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/15*(9*I*a^3*cos(d*x + c)^5 + I*(3*cos(d*x + c)^5 - 5*cos(d*x + c)^3)*a^3
 - 3*(3*sin(d*x + c)^5 - 5*sin(d*x + c)^3)*a^3 - (3*sin(d*x + c)^5 - 10*sin
(d*x + c)^3 + 15*sin(d*x + c))*a^3)/d
```

mupad [B] time = 3.57, size = 130, normalized size = 1.48

$$\frac{2\,a^3\,\left(15\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3\,30\mathrm{i}-40\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,20\mathrm{i}+7\right)}{15\,d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4\,5\mathrm{i}-10\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2\,10\mathrm{i}+5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+1\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] (2*a^3*(tan(c/2 + (d*x)/2)^3*30i - 40*tan(c/2 + (d*x)/2)^2 - tan(c/2 + (d*x
)/2)*20i + 15*tan(c/2 + (d*x)/2)^4 + 7))/(15*d*(5*tan(c/2 + (d*x)/2) - tan(
c/2 + (d*x)/2)^2*10i - 10*tan(c/2 + (d*x)/2)^3 + tan(c/2 + (d*x)/2)^4*5i +
tan(c/2 + (d*x)/2)^5 + 1i))
```

sympy [A] time = 0.40, size = 117, normalized size = 1.33

$$\begin{cases} -\frac{24ia^3d^2e^{5ic}e^{5idx}+80ia^3d^2e^{3ic}e^{3idx}+120ia^3d^2e^{ic}e^{idx}}{480d^3} & \text{for}\ 480d^3\neq 0 \\ x\left(\frac{a^3e^{5ic}}{4}+\frac{a^3e^{3ic}}{2}+\frac{a^3e^{ic}}{4}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**5*(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] Piecewise((-(24*I*a**3*d**2*exp(5*I*c)*exp(5*I*d*x) + 80*I*a**3*d**2*exp(3*
I*c)*exp(3*I*d*x) + 120*I*a**3*d**2*exp(I*c)*exp(I*d*x))/(480*d**3), Ne(480
*d**3, 0)), (x*(a**3*exp(5*I*c)/4 + a**3*exp(3*I*c)/2 + a**3*exp(I*c)/4), T
rue))
```

3.50 $\int \cos^7(c+dx)(a+ia\tan(c+dx))^3\,dx$

Optimal. Leaf size=106

$$\frac{3a^3\sin^5(c+dx)}{35d}-\frac{2a^3\sin^3(c+dx)}{7d}+\frac{3a^3\sin(c+dx)}{7d}-\frac{3ia^3\cos^5(c+dx)}{35d}-\frac{2ia\cos^7(c+dx)(a+ia\tan(c+dx))^2}{7d}$$

```
[Out] -3/35*I*a^3*cos(d*x+c)^5/d+3/7*a^3*sin(d*x+c)/d-2/7*a^3*sin(d*x+c)^3/d+3/35
*a^3*sin(d*x+c)^5/d-2/7*I*a*cos(d*x+c)^7*(a+I*a*tan(d*x+c))^2/d
```

Rubi [A] time = 0.08, antiderivative size = 106, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3496, 3486, 2633}

$$\frac{3a^3\sin^5(c+dx)}{35d}-\frac{2a^3\sin^3(c+dx)}{7d}+\frac{3a^3\sin(c+dx)}{7d}-\frac{3ia^3\cos^5(c+dx)}{35d}-\frac{2ia\cos^7(c+dx)(a+ia\tan(c+dx))^2}{7d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^7*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (((-3*I)/35)*a^3*Cos[c + d*x]^5)/d + (3*a^3*Sin[c + d*x])/(7*d) - (2*a^3*Si
n[c + d*x]^3)/(7*d) + (3*a^3*Sin[c + d*x]^5)/(35*d) - (((2*I)/7)*a*Cos[c +
d*x]^7*(a + I*a*Tan[c + d*x])^2)/d
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3486

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

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rubi steps

$$\int \cos^7(c+dx)(a+ia\tan(c+dx))^3\,dx=-\frac{2ia\cos^7(c+dx)(a+ia\tan(c+dx))^2}{7d}+\frac{1}{7}\left(3a^2\right)\int \cos^5(c+dx)(a+$$

$$=-\frac{3ia^3\cos^5(c+dx)}{35d}-\frac{2ia\cos^7(c+dx)(a+ia\tan(c+dx))^2}{7d}+\frac{1}{7}\left(3a^3$$

$$=-\frac{3ia^3\cos^5(c+dx)}{35d}-\frac{2ia\cos^7(c+dx)(a+ia\tan(c+dx))^2}{7d}-\frac{\left(3a^3\right)S}{}$$

$$=-\frac{3ia^3\cos^5(c+dx)}{35d}+\frac{3a^3\sin(c+dx)}{7d}-\frac{2a^3\sin^3(c+dx)}{7d}+\frac{3a^3\sin^5(}{35}$$

Mathematica [A] time = 0.73, size = 77, normalized size = 0.73

$$\frac{a^3(\sin(3(c+dx))-i\cos(3(c+dx)))(-56i\sin(2(c+dx))+20i\sin(4(c+dx))+84\cos(2(c+dx))-15\cos(4(c+}{280d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^7*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (a^3*((-I)*Cos[3*(c + d*x)] + Sin[3*(c + d*x)])*(35 + 84*Cos[2*(c + d*x)] -
 15*Cos[4*(c + d*x)] - (56*I)*Sin[2*(c + d*x)] + (20*I)*Sin[4*(c + d*x)]))/
(280*d)
```

fricas [A] time = 0.79, size = 76, normalized size = 0.72

$$\frac{\left(-5i\,a^3e^{(8i\,dx+8i\,c)}-28i\,a^3e^{(6i\,dx+6i\,c)}-70i\,a^3e^{(4i\,dx+4i\,c)}-140i\,a^3e^{(2i\,dx+2i\,c)}+35i\,a^3\right)e^{(-i\,dx-i\,c)}}{560\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/560*(-5*I*a^3*e^(8*I*d*x + 8*I*c) - 28*I*a^3*e^(6*I*d*x + 6*I*c) - 70*I*a
^3*e^(4*I*d*x + 4*I*c) - 140*I*a^3*e^(2*I*d*x + 2*I*c) + 35*I*a^3)*e^(-I*d*
x - I*c)/d
```

giac [B] time = 3.74, size = 465, normalized size = 4.39

$$19635\,a^3e^{(5i\,dx+3i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}+1\right)+39270\,a^3e^{(3i\,dx+i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}+1\right)+19635\,a^3e^{(i\,dx-i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/71680*(19635*a^3*e^(5*I*d*x + 3*I*c)*log(I*e^(I*d*x + I*c) + 1) + 39270*a
^3*e^(3*I*d*x + I*c)*log(I*e^(I*d*x + I*c) + 1) + 19635*a^3*e^(I*d*x - I*c)
*log(I*e^(I*d*x + I*c) + 1) + 19635*a^3*e^(5*I*d*x + 3*I*c)*log(I*e^(I*d*x
+ I*c) - 1) + 39270*a^3*e^(3*I*d*x + I*c)*log(I*e^(I*d*x + I*c) - 1) + 1963
5*a^3*e^(I*d*x - I*c)*log(I*e^(I*d*x + I*c) - 1) - 19635*a^3*e^(5*I*d*x + 3
*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 39270*a^3*e^(3*I*d*x + I*c)*log(-I*e^(I
*d*x + I*c) + 1) - 19635*a^3*e^(I*d*x - I*c)*log(-I*e^(I*d*x + I*c) + 1) -
19635*a^3*e^(5*I*d*x + 3*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 39270*a^3*e^(3*
I*d*x + I*c)*log(-I*e^(I*d*x + I*c) - 1) - 19635*a^3*e^(I*d*x - I*c)*log(-I
*e^(I*d*x + I*c) - 1) - 640*I*a^3*e^(12*I*d*x + 10*I*c) - 4864*I*a^3*e^(10*
I*d*x + 8*I*c) - 16768*I*a^3*e^(8*I*d*x + 6*I*c) - 39424*I*a^3*e^(6*I*d*x +
 4*I*c) - 40320*I*a^3*e^(4*I*d*x + 2*I*c) - 8960*I*a^3*e^(2*I*d*x) + 4480*I
*a^3*e^(-2*I*c))/(d*e^(5*I*d*x + 3*I*c) + 2*d*e^(3*I*d*x + I*c) + d*e^(I*d*
x - I*c))
```

maple [A] time = 0.51, size = 146, normalized size = 1.38

$$\frac{-ia^3\left(-\frac{(\sin^2(dx+c))(\cos^5(dx+c))}{7}-\frac{2(\cos^5(dx+c))}{35}\right)-3a^3\left(-\frac{\sin(dx+c)(\cos^6(dx+c))}{7}+\frac{\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4(\cos^2(dx+c))}{3}\right)\sin(dx+c)}{35}\right)-\frac{3ia^3(\cos}{}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(-I*a^3*(-1/7*sin(d*x+c)^2*cos(d*x+c)^5-2/35*cos(d*x+c)^5)-3*a^3*(-1/7*
sin(d*x+c)*cos(d*x+c)^6+1/35*(8/3+cos(d*x+c)^4+4/3*cos(d*x+c)^2)*sin(d*x+c)
)-3/7*I*a^3*cos(d*x+c)^7+1/7*a^3*(16/5+cos(d*x+c)^6+6/5*cos(d*x+c)^4+8/5*co
s(d*x+c)^2)*sin(d*x+c))
```

maxima [A] time = 0.40, size = 123, normalized size = 1.16

$$-\frac{15i\,a^3\cos(dx+c)^7 + i\left(5\cos(dx+c)^7 - 7\cos(dx+c)^5\right)a^3 + \left(15\sin(dx+c)^7 - 42\sin(dx+c)^5 + 35\sin(\right.}{35\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/35*(15*I*a^3*cos(d*x + c)^7 + I*(5*cos(d*x + c)^7 - 7*cos(d*x + c)^5)*a^
3 + (15*sin(d*x + c)^7 - 42*sin(d*x + c)^5 + 35*sin(d*x + c)^3)*a^3 + (5*si
n(d*x + c)^7 - 21*sin(d*x + c)^5 + 35*sin(d*x + c)^3 - 35*sin(d*x + c))*a^3
)/d
```

mupad [B] time = 4.54, size = 134, normalized size = 1.26

$$-\frac{2\,a^3\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)\left(\frac{17\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{2} - \frac{17\sin\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)}{2} + \frac{31\sin\left(\frac{5\,c}{2}+\frac{5\,d\,x}{2}\right)}{2} - \frac{5\sin\left(\frac{7\,c}{2}+\frac{7\,d\,x}{2}\right)}{2} + \frac{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)35\mathrm{i}}{8} - \frac{\cos\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)3\right.}{8}}{35\,d\,\left(\cos(3\,c+3\,d\,x) - \sin(3\,c+3\,d\,x)\,1\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^7*(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] -(2*a^3*cos(c/2 + (d*x)/2)*((cos(c/2 + (d*x)/2)*35i)/8 - (cos((3*c)/2 + (3*
d*x)/2)*35i)/8 + (cos((5*c)/2 + (5*d*x)/2)*119i)/8 - (cos((7*c)/2 + (7*d*x)
/2)*15i)/8 + (17*sin(c/2 + (d*x)/2))/2 - (17*sin((3*c)/2 + (3*d*x)/2))/2 +
(31*sin((5*c)/2 + (5*d*x)/2))/2 - (5*sin((7*c)/2 + (7*d*x)/2))/2))/(35*d*(c
os(3*c + 3*d*x) - sin(3*c + 3*d*x)*1i))
```

sympy [A] time = 0.58, size = 194, normalized size = 1.83

$$\begin{cases} -\frac{\left(10240ia^3d^4e^{8ic}e^{7idx}+57344ia^3d^4e^{6ic}e^{5idx}+143360ia^3d^4e^{4ic}e^{3idx}+286720ia^3d^4e^{2ic}e^{idx}-71680ia^3d^4e^{-idx}\right)e^{-ic}}{1146880d^5} & \text{for } 1146880d^5e^{ic} \neq 0 \\ \frac{x\left(a^3e^{8ic}+4a^3e^{6ic}+6a^3e^{4ic}+4a^3e^{2ic}+a^3\right)e^{-ic}}{16} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**7*(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] Piecewise((-(10240*I*a**3*d**4*exp(8*I*c)*exp(7*I*d*x) + 57344*I*a**3*d**4*
exp(6*I*c)*exp(5*I*d*x) + 143360*I*a**3*d**4*exp(4*I*c)*exp(3*I*d*x) + 2867
20*I*a**3*d**4*exp(2*I*c)*exp(I*d*x) - 71680*I*a**3*d**4*exp(-I*d*x))*exp(-
I*c)/(1146880*d**5), Ne(1146880*d**5*exp(I*c), 0)), (x*(a**3*exp(8*I*c) + 4
*a**3*exp(6*I*c) + 6*a**3*exp(4*I*c) + 4*a**3*exp(2*I*c) + a**3)*exp(-I*c)/
16, True))
```

3.51 $\int \cos^9(c+dx)(a+ia\tan(c+dx))^3\,dx$

Optimal. Leaf size=124

$$-\frac{5a^3\sin^7(c+dx)}{63d}+\frac{a^3\sin^5(c+dx)}{3d}-\frac{5a^3\sin^3(c+dx)}{9d}+\frac{5a^3\sin(c+dx)}{9d}-\frac{5ia^3\cos^7(c+dx)}{63d}-\frac{2ia\cos^9(c+dx)(a+i}{9d}$$

```
[Out] -5/63*I*a^3*cos(d*x+c)^7/d+5/9*a^3*sin(d*x+c)/d-5/9*a^3*sin(d*x+c)^3/d+1/3*
a^3*sin(d*x+c)^5/d-5/63*a^3*sin(d*x+c)^7/d-2/9*I*a*cos(d*x+c)^9*(a+I*a*tan(
d*x+c))^2/d
```

Rubi [A] time = 0.08, antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3496, 3486, 2633}

$$-\frac{5a^3\sin^7(c+dx)}{63d}+\frac{a^3\sin^5(c+dx)}{3d}-\frac{5a^3\sin^3(c+dx)}{9d}+\frac{5a^3\sin(c+dx)}{9d}-\frac{5ia^3\cos^7(c+dx)}{63d}-\frac{2ia\cos^9(c+dx)(a+i}{9d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^9*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (((-5*I)/63)*a^3*Cos[c + d*x]^7)/d + (5*a^3*Sin[c + d*x])/(9*d) - (5*a^3*Si
n[c + d*x]^3)/(9*d) + (a^3*Sin[c + d*x]^5)/(3*d) - (5*a^3*Sin[c + d*x]^7)/(
63*d) - (((2*I)/9)*a*Cos[c + d*x]^9*(a + I*a*Tan[c + d*x])^2)/d
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3486

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

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rubi steps

$$\int \cos^9(c+dx)(a+ia\tan(c+dx))^3\,dx = -\frac{2ia\cos^9(c+dx)(a+ia\tan(c+dx))^2}{9d} + \frac{1}{9}\left(5a^2\right)\int \cos^7(c+dx)(a+$$
$$= -\frac{5ia^3\cos^7(c+dx)}{63d} - \frac{2ia\cos^9(c+dx)(a+ia\tan(c+dx))^2}{9d} + \frac{1}{9}\left(5a^3\right.$$
$$= -\frac{5ia^3\cos^7(c+dx)}{63d} - \frac{2ia\cos^9(c+dx)(a+ia\tan(c+dx))^2}{9d} - \frac{\left(5a^3\right)S}{}$$
$$= -\frac{5ia^3\cos^7(c+dx)}{63d} + \frac{5a^3\sin(c+dx)}{9d} - \frac{5a^3\sin^3(c+dx)}{9d} + \frac{a^3\sin^5(c}{3d}$$

Mathematica [A] time = 0.85, size = 116, normalized size = 0.94

$$\frac{a^3(-378i\sin(2(c+dx)) + 216i\sin(4(c+dx)) + 14i\sin(6(c+dx)) + 567\cos(2(c+dx)) - 162\cos(4(c+dx)) -}{2016d(\cos(dx)+i\sin(dx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^9*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (a^3*(210 + 567*Cos[2*(c + d*x)] - 162*Cos[4*(c + d*x)] - 7*Cos[6*(c + d*x)
] - (378*I)*Sin[2*(c + d*x)] + (216*I)*Sin[4*(c + d*x)] + (14*I)*Sin[6*(c +
 d*x)])*((-I)*Cos[3*(c + 2*d*x)] + Sin[3*(c + 2*d*x)]))/(2016*d*(Cos[d*x] +
 I*Sin[d*x])^3)
```

fricas [A] time = 0.50, size = 104, normalized size = 0.84

$$\frac{\left(-7i\,a^3e^{(12i\,dx+12i\,c)} - 54i\,a^3e^{(10i\,dx+10i\,c)} - 189i\,a^3e^{(8i\,dx+8i\,c)} - 420i\,a^3e^{(6i\,dx+6i\,c)} - 945i\,a^3e^{(4i\,dx+4i\,c)} + 378i\,a^3e^{(2i\,d}\right.}{4032\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/4032*(-7*I*a^3*e^(12*I*d*x + 12*I*c) - 54*I*a^3*e^(10*I*d*x + 10*I*c) - 1
89*I*a^3*e^(8*I*d*x + 8*I*c) - 420*I*a^3*e^(6*I*d*x + 6*I*c) - 945*I*a^3*e^
(4*I*d*x + 4*I*c) + 378*I*a^3*e^(2*I*d*x + 2*I*c) + 21*I*a^3)*e^(-3*I*d*x -
 3*I*c)/d
```

giac [B] time = 3.92, size = 1039, normalized size = 8.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/516096*(119511*a^3*e^(11*I*d*x + 5*I*c)*log(I*e^(I*d*x + I*c) + 1) + 4780
44*a^3*e^(9*I*d*x + 3*I*c)*log(I*e^(I*d*x + I*c) + 1) + 717066*a^3*e^(7*I*d
*x + I*c)*log(I*e^(I*d*x + I*c) + 1) + 478044*a^3*e^(5*I*d*x - I*c)*log(I*e
^(I*d*x + I*c) + 1) + 119511*a^3*e^(3*I*d*x - 3*I*c)*log(I*e^(I*d*x + I*c)
+ 1) + 128898*a^3*e^(11*I*d*x + 5*I*c)*log(I*e^(I*d*x + I*c) - 1) + 515592*
a^3*e^(9*I*d*x + 3*I*c)*log(I*e^(I*d*x + I*c) - 1) + 773388*a^3*e^(7*I*d*x
+ I*c)*log(I*e^(I*d*x + I*c) - 1) + 515592*a^3*e^(5*I*d*x - I*c)*log(I*e^(I
*d*x + I*c) - 1) + 128898*a^3*e^(3*I*d*x - 3*I*c)*log(I*e^(I*d*x + I*c) - 1
) - 119511*a^3*e^(11*I*d*x + 5*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 478044*a^
3*e^(9*I*d*x + 3*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 717066*a^3*e^(7*I*d*x +
 I*c)*log(-I*e^(I*d*x + I*c) + 1) - 478044*a^3*e^(5*I*d*x - I*c)*log(-I*e^(
I*d*x + I*c) + 1) - 119511*a^3*e^(3*I*d*x - 3*I*c)*log(-I*e^(I*d*x + I*c) +
 1) - 128898*a^3*e^(11*I*d*x + 5*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 515592*
```

```
a^3*e^(9*I*d*x + 3*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 773388*a^3*e^(7*I*d*x
 + I*c)*log(-I*e^(I*d*x + I*c) - 1) - 515592*a^3*e^(5*I*d*x - I*c)*log(-I*e
^(I*d*x + I*c) - 1) - 128898*a^3*e^(3*I*d*x - 3*I*c)*log(-I*e^(I*d*x + I*c)
 - 1) + 9387*a^3*e^(11*I*d*x + 5*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 37548*a
^3*e^(9*I*d*x + 3*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 56322*a^3*e^(7*I*d*x +
 I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 37548*a^3*e^(5*I*d*x - I*c)*log(I*e^(I*
d*x) + e^(-I*c)) + 9387*a^3*e^(3*I*d*x - 3*I*c)*log(I*e^(I*d*x) + e^(-I*c))
 - 9387*a^3*e^(11*I*d*x + 5*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 37548*a^3*e
^(9*I*d*x + 3*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 56322*a^3*e^(7*I*d*x + I*
c)*log(-I*e^(I*d*x) + e^(-I*c)) - 37548*a^3*e^(5*I*d*x - I*c)*log(-I*e^(I*d
*x) + e^(-I*c)) - 9387*a^3*e^(3*I*d*x - 3*I*c)*log(-I*e^(I*d*x) + e^(-I*c))
 - 896*I*a^3*e^(20*I*d*x + 14*I*c) - 10496*I*a^3*e^(18*I*d*x + 12*I*c) - 57
216*I*a^3*e^(16*I*d*x + 10*I*c) - 195584*I*a^3*e^(14*I*d*x + 8*I*c) - 50969
6*I*a^3*e^(12*I*d*x + 6*I*c) - 861696*I*a^3*e^(10*I*d*x + 4*I*c) - 768768*I
*a^3*e^(8*I*d*x + 2*I*c) + 88704*I*a^3*e^(4*I*d*x - 2*I*c) + 59136*I*a^3*e^
(2*I*d*x - 4*I*c) - 236544*I*a^3*e^(6*I*d*x) + 2688*I*a^3*e^(-6*I*c))/(d*e^
(11*I*d*x + 5*I*c) + 4*d*e^(9*I*d*x + 3*I*c) + 6*d*e^(7*I*d*x + I*c) + 4*d*
e^(5*I*d*x - I*c) + d*e^(3*I*d*x - 3*I*c))
```

maple [A] time = 0.54, size = 166, normalized size = 1.34

$$\frac{-ia^3\left(-\frac{\left(\sin^2(dx+c)\right)\left(\cos^7(dx+c)\right)}{9}-\frac{2\left(\cos^7(dx+c)\right)}{63}\right)-3a^3\left(-\frac{\sin(dx+c)\left(\cos^8(dx+c)\right)}{9}+\frac{\left(\frac{16}{5}+\cos^6(dx+c)+\frac{6\left(\cos^4(dx+c)\right)}{5}+\frac{8\left(\cos^2(dx+c)\right)}{5}\right)\sin(dx+}{63}\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(-I*a^3*(-1/9*sin(d*x+c)^2*cos(d*x+c)^7-2/63*cos(d*x+c)^7)-3*a^3*(-1/9*
sin(d*x+c)*cos(d*x+c)^8+1/63*(16/5+cos(d*x+c)^6+6/5*cos(d*x+c)^4+8/5*cos(d*
x+c)^2)*sin(d*x+c))-1/3*I*a^3*cos(d*x+c)^9+1/9*a^3*(128/35+cos(d*x+c)^8+8/7
*cos(d*x+c)^6+48/35*cos(d*x+c)^4+64/35*cos(d*x+c)^2)*sin(d*x+c))
```

maxima [A] time = 0.53, size = 145, normalized size = 1.17

$$-\frac{105i\,a^3\cos(dx+c)^9+5i\left(7\,\cos(dx+c)^9-9\,\cos(dx+c)^7\right)a^3-3\left(35\,\sin(dx+c)^9-135\,\sin(dx+c)^7+189\,\mathrm{s}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/315*(105*I*a^3*cos(d*x + c)^9 + 5*I*(7*cos(d*x + c)^9 - 9*cos(d*x + c)^7
)*a^3 - 3*(35*sin(d*x + c)^9 - 135*sin(d*x + c)^7 + 189*sin(d*x + c)^5 - 10
5*sin(d*x + c)^3)*a^3 - (35*sin(d*x + c)^9 - 180*sin(d*x + c)^7 + 378*sin(d
*x + c)^5 - 420*sin(d*x + c)^3 + 315*sin(d*x + c))*a^3)/d
```

mupad [B] time = 4.68, size = 330, normalized size = 2.66

$$\frac{2\,a^3\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)-3{}\mathrm{i}\right)}{d\,\left({\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^2+1\right)}+\frac{2048\,a^3\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)-\mathrm{i}\right)}{9\,d\,{\left({\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^2+1\right)}^9}-\frac{1024\,a^3\,\left(8\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)-9{}\mathrm{i}\right)}{9\,d\,{\left({\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^2+1\right)}^8}-\frac{4\,a^3\,\left(14\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)-3\right.}{3\,d\,{\left({\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^2+1\right)}^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^9*(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] (2*a^3*(tan(c/2 + (d*x)/2) - 3i))/(d*(tan(c/2 + (d*x)/2)^2 + 1)) + (2048*a^
3*(tan(c/2 + (d*x)/2) - 1i))/(9*d*(tan(c/2 + (d*x)/2)^2 + 1)^9) - (1024*a^3
```

```
*(8*tan(c/2 + (d*x)/2) - 9i))/(9*d*(tan(c/2 + (d*x)/2)^2 + 1)^8) - (4*a^3*(
14*tan(c/2 + (d*x)/2) - 39i))/(3*d*(tan(c/2 + (d*x)/2)^2 + 1)^2) + (8*a^3*(
43*tan(c/2 + (d*x)/2) - 97i))/(3*d*(tan(c/2 + (d*x)/2)^2 + 1)^3) - (16*a^3*
(188*tan(c/2 + (d*x)/2) - 357i))/(7*d*(tan(c/2 + (d*x)/2)^2 + 1)^4) + (128*
a^3*(263*tan(c/2 + (d*x)/2) - 333i))/(21*d*(tan(c/2 + (d*x)/2)^2 + 1)^7) -
(64*a^3*(1598*tan(c/2 + (d*x)/2) - 2289i))/(63*d*(tan(c/2 + (d*x)/2)^2 + 1)
^6) + (32*a^3*(2041*tan(c/2 + (d*x)/2) - 3339i))/(63*d*(tan(c/2 + (d*x)/2)^
2 + 1)^5)
```

sympy [**A**] time = 0.78, size = 279, normalized size = 2.25

$$\begin{cases} -\frac{\left(270582939648ia^3d^6e^{13ic}e^{9idx}+2087354105856ia^3d^6e^{11ic}e^{7idx}+7305739370496ia^3d^6e^{9ic}e^{5idx}+16234976378880ia^3d^6e^{7ic}e^{3idx}+36528696852480\right.}{155855773237248d^7} \\ \frac{x\left(a^3e^{12ic}+6a^3e^{10ic}+15a^3e^{8ic}+20a^3e^{6ic}+15a^3e^{4ic}+6a^3e^{2ic}+a^3\right)e^{-3ic}}{64} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**9*(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] Piecewise((-(270582939648*I*a**3*d**6*exp(13*I*c)*exp(9*I*d*x) + 2087354105
856*I*a**3*d**6*exp(11*I*c)*exp(7*I*d*x) + 7305739370496*I*a**3*d**6*exp(9*
I*c)*exp(5*I*d*x) + 16234976378880*I*a**3*d**6*exp(7*I*c)*exp(3*I*d*x) + 36
528696852480*I*a**3*d**6*exp(5*I*c)*exp(I*d*x) - 14611478740992*I*a**3*d**6
*exp(3*I*c)*exp(-I*d*x) - 811748818944*I*a**3*d**6*exp(I*c)*exp(-3*I*d*x))*
exp(-4*I*c)/(155855773237248*d**7), Ne(155855773237248*d**7*exp(4*I*c), 0))
, (x*(a**3*exp(12*I*c) + 6*a**3*exp(10*I*c) + 15*a**3*exp(8*I*c) + 20*a**3*
exp(6*I*c) + 15*a**3*exp(4*I*c) + 6*a**3*exp(2*I*c) + a**3)*exp(-3*I*c)/64,
 True))
```

3.52 $\int \sec^3(c+dx)(a+ia\tan(c+dx))^4\,dx$

Optimal. Leaf size=163

$$\frac{7ia^4\sec^3(c+dx)}{8d}+\frac{21a^4\tanh^{-1}(\sin(c+dx))}{16d}+\frac{21i\sec^3(c+dx)\left(a^4+ia^4\tan(c+dx)\right)}{40d}+\frac{21a^4\tan(c+dx)\sec(c+d}{16d}$$

```
[Out] 21/16*a^4*arctanh(sin(d*x+c))/d+7/8*I*a^4*sec(d*x+c)^3/d+21/16*a^4*sec(d*x+
c)*tan(d*x+c)/d+1/6*I*a*sec(d*x+c)^3*(a+I*a*tan(d*x+c))^3/d+3/10*I*sec(d*x+
c)^3*(a^2+I*a^2*tan(d*x+c))^2/d+21/40*I*sec(d*x+c)^3*(a^4+I*a^4*tan(d*x+c))
/d
```

Rubi [A] time = 0.16, antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {3498, 3486, 3768, 3770}

$$\frac{7ia^4\sec^3(c+dx)}{8d}+\frac{21a^4\tanh^{-1}(\sin(c+dx))}{16d}+\frac{3i\sec^3(c+dx)\left(a^2+ia^2\tan(c+dx)\right)^2}{10d}+\frac{21i\sec^3(c+dx)\left(a^4+ia^4\tan\right.}{40d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3*(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (21*a^4*ArcTanh[Sin[c + d*x]])/(16*d) + (((7*I)/8)*a^4*Sec[c + d*x]^3)/d +
(21*a^4*Sec[c + d*x]*Tan[c + d*x])/(16*d) + ((I/6)*a*Sec[c + d*x]^3*(a + I*
a*Tan[c + d*x])^3)/d + (((3*I)/10)*Sec[c + d*x]^3*(a^2 + I*a^2*Tan[c + d*x]
)^2)/d + (((21*I)/40)*Sec[c + d*x]^3*(a^4 + I*a^4*Tan[c + d*x]))/d
```

Rule 3486

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

Rule 3498

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

Rule 3768

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \sec^3(c+dx)(a+ia\tan(c+dx))^4\,dx = \frac{ia\sec^3(c+dx)(a+ia\tan(c+dx))^3}{6d} + \frac{1}{2}(3a)\int \sec^3(c+dx)(a+ia\,\mathrm{ta}$$

$$= \frac{ia\sec^3(c+dx)(a+ia\tan(c+dx))^3}{6d} + \frac{3i\sec^3(c+dx)\left(a^2+ia^2\tan(c\right.}{10d}$$

$$= \frac{ia\sec^3(c+dx)(a+ia\tan(c+dx))^3}{6d} + \frac{3i\sec^3(c+dx)\left(a^2+ia^2\tan(c\right.}{10d}$$

$$= \frac{7ia^4\sec^3(c+dx)}{8d} + \frac{ia\sec^3(c+dx)(a+ia\tan(c+dx))^3}{6d} + \frac{3i\sec^3(c}{}$$

$$= \frac{7ia^4\sec^3(c+dx)}{8d} + \frac{21a^4\sec(c+dx)\tan(c+dx)}{16d} + \frac{ia\sec^3(c+dx)(a}{}$$

$$= \frac{21a^4\tanh^{-1}(\sin(c+dx))}{16d} + \frac{7ia^4\sec^3(c+dx)}{8d} + \frac{21a^4\sec(c+dx)\tan}{16d}$$

Mathematica [A] time = 2.09, size = 171, normalized size = 1.05

$$-\frac{a^4(\cos(4c)-i\sin(4c))(\tan(c+dx)-i)^4\sec^2(c+dx)\left(-4608i\cos(c+dx)+5(90\sin(c+dx)+155\sin(3(c+\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^3*(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] -1/3840*(a^4*Sec[c + d*x]^2*(Cos[4*c] - I*Sin[4*c])*((-4608*I)*Cos[c + d*x]
 + 5040*Cos[c + d*x]^6*(Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - Log[Cos[
(c + d*x)/2] + Sin[(c + d*x)/2]]) + 5*((-512*I)*Cos[3*(c + d*x)] + 90*Sin[c
 + d*x] + 155*Sin[3*(c + d*x)] - 63*Sin[5*(c + d*x)]))*(-I + Tan[c + d*x])^
4)/(d*(Cos[d*x] + I*Sin[d*x])^4)
```

fricas [B] time = 0.67, size = 364, normalized size = 2.23

$$\frac{-630i\,a^4e^{(11i\,dx+11i\,c)} + 6670i\,a^4e^{(9i\,dx+9i\,c)} + 10116i\,a^4e^{(7i\,dx+7i\,c)} + 8316i\,a^4e^{(5i\,dx+5i\,c)} + 3570i\,a^4e^{(3i\,dx+3i\,c)} + 630}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/240*(-630*I*a^4*e^(11*I*d*x + 11*I*c) + 6670*I*a^4*e^(9*I*d*x + 9*I*c) +
10116*I*a^4*e^(7*I*d*x + 7*I*c) + 8316*I*a^4*e^(5*I*d*x + 5*I*c) + 3570*I*a
^4*e^(3*I*d*x + 3*I*c) + 630*I*a^4*e^(I*d*x + I*c) + 315*(a^4*e^(12*I*d*x +
 12*I*c) + 6*a^4*e^(10*I*d*x + 10*I*c) + 15*a^4*e^(8*I*d*x + 8*I*c) + 20*a^
4*e^(6*I*d*x + 6*I*c) + 15*a^4*e^(4*I*d*x + 4*I*c) + 6*a^4*e^(2*I*d*x + 2*I
*c) + a^4)*log(e^(I*d*x + I*c) + I) - 315*(a^4*e^(12*I*d*x + 12*I*c) + 6*a^
4*e^(10*I*d*x + 10*I*c) + 15*a^4*e^(8*I*d*x + 8*I*c) + 20*a^4*e^(6*I*d*x +
6*I*c) + 15*a^4*e^(4*I*d*x + 4*I*c) + 6*a^4*e^(2*I*d*x + 2*I*c) + a^4)*log(
e^(I*d*x + I*c) - I))/(d*e^(12*I*d*x + 12*I*c) + 6*d*e^(10*I*d*x + 10*I*c)
+ 15*d*e^(8*I*d*x + 8*I*c) + 20*d*e^(6*I*d*x + 6*I*c) + 15*d*e^(4*I*d*x + 4
*I*c) + 6*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [A] time = 1.32, size = 237, normalized size = 1.45

$$\frac{315\,a^4\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right) - 315\,a^4\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right) - \frac{2\left(75\,a^4\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{11}+960i\,a^4\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{10}+\right.}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/240*(315*a^4*log(tan(1/2*d*x + 1/2*c) + 1) - 315*a^4*log(tan(1/2*d*x + 1/
2*c) - 1) - 2*(75*a^4*tan(1/2*d*x + 1/2*c)^11 + 960*I*a^4*tan(1/2*d*x + 1/2
*c)^10 + 1175*a^4*tan(1/2*d*x + 1/2*c)^9 - 4800*I*a^4*tan(1/2*d*x + 1/2*c)^
8 - 1890*a^4*tan(1/2*d*x + 1/2*c)^7 + 4480*I*a^4*tan(1/2*d*x + 1/2*c)^6 - 1
890*a^4*tan(1/2*d*x + 1/2*c)^5 - 1920*I*a^4*tan(1/2*d*x + 1/2*c)^4 + 1175*a
^4*tan(1/2*d*x + 1/2*c)^3 + 1728*I*a^4*tan(1/2*d*x + 1/2*c)^2 + 75*a^4*tan(
1/2*d*x + 1/2*c) - 448*I*a^4)/(tan(1/2*d*x + 1/2*c)^2 - 1)^6)/d
```

maple [B] time = 0.52, size = 324, normalized size = 1.99

$$\frac{a^4\left(\sin^5(dx+c)\right)}{6d\cos(dx+c)^6}+\frac{a^4\left(\sin^5(dx+c)\right)}{24d\cos(dx+c)^4}-\frac{a^4\left(\sin^5(dx+c)\right)}{48d\cos(dx+c)^2}-\frac{a^4\left(\sin^3(dx+c)\right)}{48d}-\frac{13a^4\sin(dx+c)}{16d}+\frac{21a^4\ln(\sec(dx\cdots}{1\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 1/6/d*a^4*sin(d*x+c)^5/cos(d*x+c)^6+1/24/d*a^4*sin(d*x+c)^5/cos(d*x+c)^4-1/
48/d*a^4*sin(d*x+c)^5/cos(d*x+c)^2-1/48*a^4*sin(d*x+c)^3/d-13/16*a^4*sin(d*
x+c)/d+21/16/d*a^4*ln(sec(d*x+c)+tan(d*x+c))+4/3*I/d*a^4/cos(d*x+c)^3+8/15*
I/d*a^4*cos(d*x+c)-4/15*I/d*a^4*sin(d*x+c)^4/cos(d*x+c)^3+4/15*I/d*a^4*sin(
d*x+c)^4/cos(d*x+c)+4/15*I/d*a^4*cos(d*x+c)*sin(d*x+c)^2-3/2/d*a^4*sin(d*x+
c)^3/cos(d*x+c)^4-3/4/d*a^4*sin(d*x+c)^3/cos(d*x+c)^2-4/5*I/d*a^4*sin(d*x+c
)^4/cos(d*x+c)^5+1/2*a^4*sec(d*x+c)*tan(d*x+c)/d
```

maxima [A] time = 0.51, size = 246, normalized size = 1.51

$$-\frac{5\,a^4\left(\frac{2\left(3\,\sin(dx+c)^5+8\,\sin(dx+c)^3-3\,\sin(dx+c)\right)}{\sin(dx+c)^6-3\,\sin(dx+c)^4+3\,\sin(dx+c)^2-1}-3\,\log(\sin(dx+c)+1)+3\,\log(\sin(dx+c)-1)\right)+180\,a^4\left(\frac{2\left(\sin(dx+c\cdots\right.}{\sin(dx+c)^4-\cdots}\right.\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] -1/480*(5*a^4*(2*(3*sin(d*x + c)^5 + 8*sin(d*x + c)^3 - 3*sin(d*x + c))/(si
n(d*x + c)^6 - 3*sin(d*x + c)^4 + 3*sin(d*x + c)^2 - 1) - 3*log(sin(d*x + c
) + 1) + 3*log(sin(d*x + c) - 1)) + 180*a^4*(2*(sin(d*x + c)^3 + sin(d*x +
c))/(sin(d*x + c)^4 - 2*sin(d*x + c)^2 + 1) - log(sin(d*x + c) + 1) + log(s
in(d*x + c) - 1)) + 120*a^4*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) - log(sin(
d*x + c) + 1) + log(sin(d*x + c) - 1)) - 640*I*a^4/cos(d*x + c)^3 - 128*I*(
5*cos(d*x + c)^2 - 3)*a^4/cos(d*x + c)^5)/d
```

mupad [B] time = 7.16, size = 290, normalized size = 1.78

$$\frac{21\,a^4\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{8\,d}-\frac{\frac{5\,a^4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{11}}{8}+a^4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}\,8\mathrm{i}+\frac{235\,a^4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9}{24}-a^4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8\,40\mathrm{i}-\frac{63\,a^{\cdots}}{\cdots}}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{12}-6\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^4/cos(c + d*x)^3,x)
```

```
[Out] (21*a^4*atanh(tan(c/2 + (d*x)/2)))/(8*d) - ((a^4*tan(c/2 + (d*x)/2)^2*72i)/
5 + (235*a^4*tan(c/2 + (d*x)/2)^3)/24 - a^4*tan(c/2 + (d*x)/2)^4*16i - (63*
a^4*tan(c/2 + (d*x)/2)^5)/4 + (a^4*tan(c/2 + (d*x)/2)^6*112i)/3 - (63*a^4*t
```

```
an(c/2 + (d*x)/2)^7)/4 - a^4*tan(c/2 + (d*x)/2)^8*40i + (235*a^4*tan(c/2 +
(d*x)/2)^9)/24 + a^4*tan(c/2 + (d*x)/2)^10*8i + (5*a^4*tan(c/2 + (d*x)/2)^1
1)/8 - (a^4*56i)/15 + (5*a^4*tan(c/2 + (d*x)/2))/8)/(d*(15*tan(c/2 + (d*x)/
2)^4 - 6*tan(c/2 + (d*x)/2)^2 - 20*tan(c/2 + (d*x)/2)^6 + 15*tan(c/2 + (d*x
)/2)^8 - 6*tan(c/2 + (d*x)/2)^10 + tan(c/2 + (d*x)/2)^12 + 1))
```

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

$$a^4 \left(\int \left(-6\tan^2(c+dx)\sec^3(c+dx) \right) dx + \int \tan^4(c+dx)\sec^3(c+dx)\, dx + \int 4i\tan(c+dx)\sec^3(c+dx)\, d$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3*(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] a**4*(Integral(-6*tan(c + d*x)**2*sec(c + d*x)**3, x) + Integral(tan(c + d*
x)**4*sec(c + d*x)**3, x) + Integral(4*I*tan(c + d*x)*sec(c + d*x)**3, x) +
 Integral(-4*I*tan(c + d*x)**3*sec(c + d*x)**3, x) + Integral(sec(c + d*x)*
*3, x))
```

3.53 $\int \sec(c+dx)(a+ia\tan(c+dx))^4\,dx$

Optimal. Leaf size=133

$$\frac{35ia^4\sec(c+dx)}{8d}+\frac{35a^4\tanh^{-1}(\sin(c+dx))}{8d}+\frac{35i\sec(c+dx)\left(a^4+ia^4\tan(c+dx)\right)}{24d}+\frac{7i\sec(c+dx)\left(a^2+ia^2\tan\right.}{12d}$$

```
[Out] 35/8*a^4*arctanh(sin(d*x+c))/d+35/8*I*a^4*sec(d*x+c)/d+1/4*I*a*sec(d*x+c)*(
a+I*a*tan(d*x+c))^3/d+7/12*I*sec(d*x+c)*(a^2+I*a^2*tan(d*x+c))^2/d+35/24*I*
sec(d*x+c)*(a^4+I*a^4*tan(d*x+c))/d
```

Rubi [A] time = 0.10, antiderivative size = 133, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {3498, 3486, 3770}

$$\frac{35ia^4\sec(c+dx)}{8d}+\frac{35a^4\tanh^{-1}(\sin(c+dx))}{8d}+\frac{7i\sec(c+dx)\left(a^2+ia^2\tan(c+dx)\right)^2}{12d}+\frac{35i\sec(c+dx)\left(a^4+ia^4\tan\right.}{24d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]*(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (35*a^4*ArcTanh[Sin[c + d*x]])/(8*d) + (((35*I)/8)*a^4*Sec[c + d*x])/d + ((
I/4)*a*Sec[c + d*x]*(a + I*a*Tan[c + d*x])^3)/d + (((7*I)/12)*Sec[c + d*x]*
(a^2 + I*a^2*Tan[c + d*x])^2)/d + (((35*I)/24)*Sec[c + d*x]*(a^4 + I*a^4*Ta
n[c + d*x]))/d
```

Rule 3486

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

Rule 3498

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \sec(c+dx)(a+ia\tan(c+dx))^4\,dx = \frac{ia\sec(c+dx)(a+ia\tan(c+dx))^3}{4d} + \frac{1}{4}(7a)\int \sec(c+dx)(a+ia\tan($$

$$= \frac{ia\sec(c+dx)(a+ia\tan(c+dx))^3}{4d} + \frac{7i\sec(c+dx)\left(a^2+ia^2\tan(c+\right.}{12d}$$

$$= \frac{ia\sec(c+dx)(a+ia\tan(c+dx))^3}{4d} + \frac{7i\sec(c+dx)\left(a^2+ia^2\tan(c+\right.}{12d}$$

$$= \frac{35ia^4\sec(c+dx)}{8d} + \frac{ia\sec(c+dx)(a+ia\tan(c+dx))^3}{4d} + \frac{7i\sec(c+}{}$$

$$= \frac{35a^4\tanh^{-1}(\sin(c+dx))}{8d} + \frac{35ia^4\sec(c+dx)}{8d} + \frac{ia\sec(c+dx)(a+ia}{4d}$$

Mathematica [A] time = 1.48, size = 237, normalized size = 1.78

$$-\frac{a^4\sec^4(c+dx)\left(3\left(42\sin(c+dx)+58\sin(3(c+dx))-128i\cos(3(c+dx))+35\cos(4(c+dx))\log\left(\cos\left(\frac{1}{2}(c\right.\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]*(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] -1/192*(a^4*Sec[c + d*x]^4*((-896*I)*Cos[c + d*x] + 3*((-128*I)*Cos[3*(c +
d*x)] + 105*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + 35*Cos[4*(c + d*x)]*
Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + 140*Cos[2*(c + d*x)]*(Log[Cos[(c
 + d*x)/2] - Sin[(c + d*x)/2]] - Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]])
- 105*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] - 35*Cos[4*(c + d*x)]*Log[Co
s[(c + d*x)/2] + Sin[(c + d*x)/2]] + 42*Sin[c + d*x] + 58*Sin[3*(c + d*x)])
))/d
```

fricas [B] time = 0.57, size = 256, normalized size = 1.92

$$\frac{558i\,a^4e^{(7i\,dx+7i\,c)}+1022i\,a^4e^{(5i\,dx+5i\,c)}+770i\,a^4e^{(3i\,dx+3i\,c)}+210i\,a^4e^{(i\,dx+i\,c)}+105\left(a^4e^{(8i\,dx+8i\,c)}+4\,a^4e^{(6i\,dx+6i\,c)}\right.}{24\left(de^{(8i\,dx+8i\,c}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/24*(558*I*a^4*e^(7*I*d*x + 7*I*c) + 1022*I*a^4*e^(5*I*d*x + 5*I*c) + 770*
I*a^4*e^(3*I*d*x + 3*I*c) + 210*I*a^4*e^(I*d*x + I*c) + 105*(a^4*e^(8*I*d*x
 + 8*I*c) + 4*a^4*e^(6*I*d*x + 6*I*c) + 6*a^4*e^(4*I*d*x + 4*I*c) + 4*a^4*e
^(2*I*d*x + 2*I*c) + a^4)*log(e^(I*d*x + I*c) + I) - 105*(a^4*e^(8*I*d*x +
8*I*c) + 4*a^4*e^(6*I*d*x + 6*I*c) + 6*a^4*e^(4*I*d*x + 4*I*c) + 4*a^4*e^(2
*I*d*x + 2*I*c) + a^4)*log(e^(I*d*x + I*c) - I))/(d*e^(8*I*d*x + 8*I*c) + 4
*d*e^(6*I*d*x + 6*I*c) + 6*d*e^(4*I*d*x + 4*I*c) + 4*d*e^(2*I*d*x + 2*I*c)
+ d)
```

giac [A] time = 1.62, size = 173, normalized size = 1.30

$$\frac{105\,a^4\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)-105\,a^4\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)-\frac{2\left(81\,a^4\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7+96i\,a^4\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^6-105\right.}{}}{24\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/24*(105*a^4*log(tan(1/2*d*x + 1/2*c) + 1) - 105*a^4*log(tan(1/2*d*x + 1/2
*c) - 1) - 2*(81*a^4*tan(1/2*d*x + 1/2*c)^7 + 96*I*a^4*tan(1/2*d*x + 1/2*c)
^6 - 105*a^4*tan(1/2*d*x + 1/2*c)^5 - 480*I*a^4*tan(1/2*d*x + 1/2*c)^4 - 10
5*a^4*tan(1/2*d*x + 1/2*c)^3 + 544*I*a^4*tan(1/2*d*x + 1/2*c)^2 + 81*a^4*ta
n(1/2*d*x + 1/2*c) - 160*I*a^4)/(tan(1/2*d*x + 1/2*c)^2 - 1)^4)/d
```

maple [A] time = 0.27, size = 231, normalized size = 1.74

$$\frac{a^4\left(\sin^5(dx+c)\right)}{4d\cos(dx+c)^4}-\frac{a^4\left(\sin^5(dx+c)\right)}{8d\cos(dx+c)^2}-\frac{a^4\left(\sin^3(dx+c)\right)}{8d}-\frac{27a^4\sin(dx+c)}{8d}+\frac{35a^4\ln(\sec(dx+c)+\tan(dx+c))}{8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)*(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 1/4/d*a^4*sin(d*x+c)^5/cos(d*x+c)^4-1/8/d*a^4*sin(d*x+c)^5/cos(d*x+c)^2-1/8
*a^4*sin(d*x+c)^3/d-27/8*a^4*sin(d*x+c)/d+35/8/d*a^4*ln(sec(d*x+c)+tan(d*x+
c))-4/3*I/d*a^4*sin(d*x+c)^4/cos(d*x+c)^3+4/3*I/d*a^4*sin(d*x+c)^4/cos(d*x+
c)+4/3*I/d*a^4*cos(d*x+c)*sin(d*x+c)^2+8/3*I/d*a^4*cos(d*x+c)-3/d*a^4*sin(d
*x+c)^3/cos(d*x+c)^2+4*I/d*a^4/cos(d*x+c)
```

maxima [A] time = 0.47, size = 180, normalized size = 1.35

$$\frac{3\,a^4\left(\frac{2\left(5\,\sin(dx+c)^3-3\,\sin(dx+c)\right)}{\sin(dx+c)^4-2\,\sin(dx+c)^2+1}+3\,\log(\sin(dx+c)+1)-3\,\log(\sin(dx+c)-1)\right)+72\,a^4\left(\frac{2\,\sin(dx+c)}{\sin(dx+c)^2-1}+\log(\sin(\cdots\right.}{48\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] 1/48*(3*a^4*(2*(5*sin(d*x + c)^3 - 3*sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(
d*x + c)^2 + 1) + 3*log(sin(d*x + c) + 1) - 3*log(sin(d*x + c) - 1)) + 72*a
^4*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) + log(sin(d*x + c) + 1) - log(sin(d
*x + c) - 1)) + 48*a^4*log(sec(d*x + c) + tan(d*x + c)) + 192*I*a^4/cos(d*x
 + c) + 64*I*(3*cos(d*x + c)^2 - 1)*a^4/cos(d*x + c)^3)/d
```

mupad [B] time = 6.77, size = 198, normalized size = 1.49

$$\frac{35\,a^4\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{4\,d}-\frac{\frac{27\,a^4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{4}+a^4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6\,8\mathrm{i}-\frac{35\,a^4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{4}-a^4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4\,40\mathrm{i}-\frac{35\,a^4\,\mathrm{t}\cdots}{\cdots}}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8-4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6+6\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^4/cos(c + d*x),x)
```

```
[Out] (35*a^4*atanh(tan(c/2 + (d*x)/2)))/(4*d) - ((a^4*tan(c/2 + (d*x)/2)^2*136i)
/3 - (35*a^4*tan(c/2 + (d*x)/2)^3)/4 - a^4*tan(c/2 + (d*x)/2)^4*40i - (35*a
^4*tan(c/2 + (d*x)/2)^5)/4 + a^4*tan(c/2 + (d*x)/2)^6*8i + (27*a^4*tan(c/2
+ (d*x)/2)^7)/4 - (a^4*40i)/3 + (27*a^4*tan(c/2 + (d*x)/2))/4)/(d*(6*tan(c/
2 + (d*x)/2)^4 - 4*tan(c/2 + (d*x)/2)^2 - 4*tan(c/2 + (d*x)/2)^6 + tan(c/2
+ (d*x)/2)^8 + 1))
```

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

$$a^4\left(\int\left(-6\tan^2(c+dx)\sec(c+dx)\right)dx+\int\tan^4(c+dx)\sec(c+dx)\,dx+\int 4i\tan(c+dx)\sec(c+dx)\,dx+\int\cdots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] a**4*(Integral(-6*tan(c + d*x)**2*sec(c + d*x), x) + Integral(tan(c + d*x)*
*4*sec(c + d*x), x) + Integral(4*I*tan(c + d*x)*sec(c + d*x), x) + Integral
(-4*I*tan(c + d*x)**3*sec(c + d*x), x) + Integral(sec(c + d*x), x))
```

3.54 $\int \cos(c+dx)(a+ia\tan(c+dx))^4\,dx$

Optimal. Leaf size=97

$$-\frac{15ia^4\sec(c+dx)}{2d}-\frac{15a^4\tanh^{-1}(\sin(c+dx))}{2d}-\frac{5i\sec(c+dx)\left(a^4+ia^4\tan(c+dx)\right)}{2d}-\frac{2ia\cos(c+dx)(a+ia\tan(c$$

```
[Out] -15/2*a^4*arctanh(sin(d*x+c))/d-15/2*I*a^4*sec(d*x+c)/d-2*I*a*cos(d*x+c)*(a
+I*a*tan(d*x+c))^3/d-5/2*I*sec(d*x+c)*(a^4+I*a^4*tan(d*x+c))/d
```

Rubi [A] time = 0.07, antiderivative size = 97, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {3496, 3498, 3486, 3770}

$$-\frac{15ia^4\sec(c+dx)}{2d}-\frac{15a^4\tanh^{-1}(\sin(c+dx))}{2d}-\frac{5i\sec(c+dx)\left(a^4+ia^4\tan(c+dx)\right)}{2d}-\frac{2ia\cos(c+dx)(a+ia\tan(c$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]*(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (-15*a^4*ArcTanh[Sin[c + d*x]])/(2*d) - (((15*I)/2)*a^4*Sec[c + d*x])/d - (
(2*I)*a*Cos[c + d*x]*(a + I*a*Tan[c + d*x])^3)/d - (((5*I)/2)*Sec[c + d*x]*
(a^4 + I*a^4*Tan[c + d*x]))/d
```

Rule 3486

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

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3498

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \cos(c+dx)(a+ia\tan(c+dx))^4\,dx = -\frac{2ia\cos(c+dx)(a+ia\tan(c+dx))^3}{d} - \left(5a^2\right)\int \sec(c+dx)(a+ia\tan$$

$$= -\frac{2ia\cos(c+dx)(a+ia\tan(c+dx))^3}{d} - \frac{5i\sec(c+dx)\left(a^4+ia^4\tan(c\right.}{2d}$$

$$= -\frac{15ia^4\sec(c+dx)}{2d} - \frac{2ia\cos(c+dx)(a+ia\tan(c+dx))^3}{d} - \frac{5i\sec(c}{}$$

$$= -\frac{15a^4\tanh^{-1}(\sin(c+dx))}{2d} - \frac{15ia^4\sec(c+dx)}{2d} - \frac{2ia\cos(c+dx)(a+}{d}$$

Mathematica [**B**] time = 6.65, size = 906, normalized size = 9.34

$$\frac{\cos^4(c+dx)(8\cos(3c)-8i\sin(3c))\sin(dx)(i\tan(c+dx)a+a)^4}{d(\cos(dx)+i\sin(dx))^4} - \frac{i\cos^4(c+dx)(4\cos(4c)-4i\sin(4c))\sin}{d\left(\cos\left(\frac{c}{2}\right)-\sin\left(\frac{c}{2}\right)\right)(\cos(dx)+i\sin(dx))^4\left(\right.}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]*(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (15*Cos[4*c]*Cos[c + d*x]^4*Log[Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2]]*(a
 + I*a*Tan[c + d*x])^4)/(2*d*(Cos[d*x] + I*Sin[d*x])^4) - (15*Cos[4*c]*Cos[
c + d*x]^4*Log[Cos[c/2 + (d*x)/2] + Sin[c/2 + (d*x)/2]]*(a + I*a*Tan[c + d*
x])^4)/(2*d*(Cos[d*x] + I*Sin[d*x])^4) + (Cos[d*x]*Cos[c + d*x]^4*((-8*I)*C
os[3*c] - 8*Sin[3*c])*(a + I*a*Tan[c + d*x])^4)/(d*(Cos[d*x] + I*Sin[d*x])^
4) + (Cos[c + d*x]^4*Sec[c]*((-4*I)*Cos[4*c] - 4*Sin[4*c])*(a + I*a*Tan[c +
 d*x])^4)/(d*(Cos[d*x] + I*Sin[d*x])^4) - (((15*I)/2)*Cos[c + d*x]^4*Log[Co
s[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2]]*Sin[4*c]*(a + I*a*Tan[c + d*x])^4)/(
d*(Cos[d*x] + I*Sin[d*x])^4) + (((15*I)/2)*Cos[c + d*x]^4*Log[Cos[c/2 + (d*
x)/2] + Sin[c/2 + (d*x)/2]]*Sin[4*c]*(a + I*a*Tan[c + d*x])^4)/(d*(Cos[d*x]
 + I*Sin[d*x])^4) + (Cos[c + d*x]^4*(8*Cos[3*c] - (8*I)*Sin[3*c])*Sin[d*x]*
(a + I*a*Tan[c + d*x])^4)/(d*(Cos[d*x] + I*Sin[d*x])^4) + (Cos[c + d*x]^4*(
Cos[4*c]/4 - (I/4)*Sin[4*c])*(a + I*a*Tan[c + d*x])^4)/(d*(Cos[d*x] + I*Sin
[d*x])^4*(Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2])^2) - (I*Cos[c + d*x]^4*(
4*Cos[4*c] - (4*I)*Sin[4*c])*Sin[(d*x)/2]*(a + I*a*Tan[c + d*x])^4)/(d*(Cos
[c/2] - Sin[c/2])*(Cos[d*x] + I*Sin[d*x])^4*(Cos[c/2 + (d*x)/2] - Sin[c/2 +
 (d*x)/2])) + (Cos[c + d*x]^4*(-1/4*Cos[4*c] + (I/4)*Sin[4*c])*(a + I*a*Tan
[c + d*x])^4)/(d*(Cos[d*x] + I*Sin[d*x])^4*(Cos[c/2 + (d*x)/2] + Sin[c/2 +
(d*x)/2])^2) + (I*Cos[c + d*x]^4*(4*Cos[4*c] - (4*I)*Sin[4*c])*Sin[(d*x)/2]
*(a + I*a*Tan[c + d*x])^4)/(d*(Cos[c/2] + Sin[c/2])*(Cos[d*x] + I*Sin[d*x])
^4*(Cos[c/2 + (d*x)/2] + Sin[c/2 + (d*x)/2]))
```

fricas [**A**] time = 1.29, size = 162, normalized size = 1.67

$$\frac{-16i\,a^4e^{(5i\,dx+5i\,c)} - 50i\,a^4e^{(3i\,dx+3i\,c)} - 30i\,a^4e^{(i\,dx+i\,c)} - 15\left(a^4e^{(4i\,dx+4i\,c)} + 2\,a^4e^{(2i\,dx+2i\,c)} + a^4\right)\log\left(e^{(i\,dx+i\,c)} + i\right) -}{2\left(de^{(4i\,dx+4i\,c)} + 2\,de^{(2i\,dx+2i\,c)} + d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/2*(-16*I*a^4*e^(5*I*d*x + 5*I*c) - 50*I*a^4*e^(3*I*d*x + 3*I*c) - 30*I*a^
4*e^(I*d*x + I*c) - 15*(a^4*e^(4*I*d*x + 4*I*c) + 2*a^4*e^(2*I*d*x + 2*I*c)
 + a^4)*log(e^(I*d*x + I*c) + I) + 15*(a^4*e^(4*I*d*x + 4*I*c) + 2*a^4*e^(2
*I*d*x + 2*I*c) + a^4)*log(e^(I*d*x + I*c) - I))/(d*e^(4*I*d*x + 4*I*c) + 2
*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [B] time = 3.62, size = 372, normalized size = 3.84

$$\frac{235\,a^4 e^{(4i\,dx+4i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}+1\right)+470\,a^4 e^{(2i\,dx+2i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}+1\right)-5\,a^4 e^{(4i\,dx+4i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}-1\right)-10}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/32*(235*a^4*e^(4*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 470*a^4*e^(2
*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) + 1) - 5*a^4*e^(4*I*d*x + 4*I*c)*log(
I*e^(I*d*x + I*c) - 1) - 10*a^4*e^(2*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) -
 1) - 235*a^4*e^(4*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 470*a^4*e^(
2*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) + 1) + 5*a^4*e^(4*I*d*x + 4*I*c)*lo
g(-I*e^(I*d*x + I*c) - 1) + 10*a^4*e^(2*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*
c) - 1) - 256*I*a^4*e^(5*I*d*x + 5*I*c) - 800*I*a^4*e^(3*I*d*x + 3*I*c) - 4
80*I*a^4*e^(I*d*x + I*c) + 235*a^4*log(I*e^(I*d*x + I*c) + 1) - 5*a^4*log(I
*e^(I*d*x + I*c) - 1) - 235*a^4*log(-I*e^(I*d*x + I*c) + 1) + 5*a^4*log(-I*
e^(I*d*x + I*c) - 1))/(d*e^(4*I*d*x + 4*I*c) + 2*d*e^(2*I*d*x + 2*I*c) + d)
```

maple [A] time = 0.40, size = 141, normalized size = 1.45

$$\frac{a^4\left(\sin^5(dx+c)\right)}{2d\cos(dx+c)^2}+\frac{a^4\left(\sin^3(dx+c)\right)}{2d}+\frac{17a^4\sin(dx+c)}{2d}-\frac{15a^4\ln(\sec(dx+c)+\tan(dx+c))}{2d}-\frac{4ia^4\left(\sin^4(dx+c\right.}{d\cos(dx+c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)*(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 1/2/d*a^4*sin(d*x+c)^5/cos(d*x+c)^2+1/2*a^4*sin(d*x+c)^3/d+17/2*a^4*sin(d*x
+c)/d-15/2/d*a^4*ln(sec(d*x+c)+tan(d*x+c))-4*I/d*a^4*sin(d*x+c)^4/cos(d*x+c
)-4*I/d*a^4*sin(d*x+c)^2*cos(d*x+c)-12*I/d*a^4*cos(d*x+c)
```

maxima [A] time = 0.45, size = 137, normalized size = 1.41

$$-\frac{a^4\left(\frac{2\sin(dx+c)}{\sin(dx+c)^2-1}+3\log(\sin(dx+c)+1)-3\log(\sin(dx+c)-1)-4\sin(dx+c)\right)+16i\,a^4\left(\frac{1}{\cos(dx+c)}+\cos(dx\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] -1/4*(a^4*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) + 3*log(sin(d*x + c) + 1) -
3*log(sin(d*x + c) - 1) - 4*sin(d*x + c)) + 16*I*a^4*(1/cos(d*x + c) + cos(
d*x + c)) + 12*a^4*(log(sin(d*x + c) + 1) - log(sin(d*x + c) - 1) - 2*sin(d
*x + c)) + 16*I*a^4*cos(d*x + c) - 4*a^4*sin(d*x + c))/d
```

mupad [B] time = 5.30, size = 159, normalized size = 1.64

$$-\frac{15\,a^4\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d}+\frac{17\,a^4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+a^4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3 9\mathrm{i}-39\,a^4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-a^4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right.}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4 1\mathrm{i}-2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2 2\mathrm{i}+\tan\left(\frac{c}{2}\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^4,x)
```

```
[Out] (a^4*tan(c/2 + (d*x)/2)^3*9i - 39*a^4*tan(c/2 + (d*x)/2)^2 + 17*a^4*tan(c/2
 + (d*x)/2)^4 + 24*a^4 - a^4*tan(c/2 + (d*x)/2)*7i)/(d*(tan(c/2 + (d*x)/2)
```

```
- tan(c/2 + (d*x)/2)^2*2i - 2*tan(c/2 + (d*x)/2)^3 + tan(c/2 + (d*x)/2)^4*1
i + tan(c/2 + (d*x)/2)^5 + 1i)) - (15*a^4*atanh(tan(c/2 + (d*x)/2)))/d
```

sympy [A] time = 0.44, size = 153, normalized size = 1.58

$$\frac{15a^4\left(\frac{\log\left(e^{idx}-ie^{-ic}\right)}{2}-\frac{\log\left(e^{idx}+ie^{-ic}\right)}{2}\right)}{d}+\frac{9ia^4e^{3ic}e^{3idx}+7ia^4e^{ic}e^{idx}}{-de^{4ic}e^{4idx}-2de^{2ic}e^{2idx}-d}+\begin{cases}-\frac{8ia^4e^{ic}e^{idx}}{d} & \text{for } d\neq 0\\ 8a^4xe^{ic} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] 15*a**4*(log(exp(I*d*x) - I*exp(-I*c))/2 - log(exp(I*d*x) + I*exp(-I*c))/2)
/d + (9*I*a**4*exp(3*I*c)*exp(3*I*d*x) + 7*I*a**4*exp(I*c)*exp(I*d*x))/(-d*
exp(4*I*c)*exp(4*I*d*x) - 2*d*exp(2*I*c)*exp(2*I*d*x) - d) + Piecewise((-8*
I*a**4*exp(I*c)*exp(I*d*x)/d, Ne(d, 0)), (8*a**4*x*exp(I*c), True))
```

3.55 $\int \cos^3(c+dx)(a+ia\tan(c+dx))^4\,dx$

Optimal. Leaf size=78

$$\frac{a^4\tanh^{-1}(\sin(c+dx))}{d}+\frac{2i\cos(c+dx)\left(a^4+ia^4\tan(c+dx)\right)}{d}-\frac{2ia\cos^3(c+dx)(a+ia\tan(c+dx))^3}{3d}$$

```
[Out] a^4*arctanh(sin(d*x+c))/d-2/3*I*a*cos(d*x+c)^3*(a+I*a*tan(d*x+c))^3/d+2*I*c
os(d*x+c)*(a^4+I*a^4*tan(d*x+c))/d
```

Rubi [A] time = 0.08, antiderivative size = 78, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3496, 3770}

$$\frac{a^4\tanh^{-1}(\sin(c+dx))}{d}+\frac{2i\cos(c+dx)\left(a^4+ia^4\tan(c+dx)\right)}{d}-\frac{2ia\cos^3(c+dx)(a+ia\tan(c+dx))^3}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (a^4*ArcTanh[Sin[c + d*x]])/d - (((2*I)/3)*a*Cos[c + d*x]^3*(a + I*a*Tan[c
+ d*x])^3)/d + ((2*I)*Cos[c + d*x]*(a^4 + I*a^4*Tan[c + d*x]))/d
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\int \cos^3(c+dx)(a+ia\tan(c+dx))^4\,dx &= -\frac{2ia\cos^3(c+dx)(a+ia\tan(c+dx))^3}{3d}-a^2\int \cos(c+dx)(a+ia\tan(c\\ &= -\frac{2ia\cos^3(c+dx)(a+ia\tan(c+dx))^3}{3d}+\frac{2i\cos(c+dx)\left(a^4+ia^4\tan(c\right.}{d}\\ &= \frac{a^4\tanh^{-1}(\sin(c+dx))}{d}-\frac{2ia\cos^3(c+dx)(a+ia\tan(c+dx))^3}{3d}+\frac{2i\cos}{}\end{aligned}$$

Mathematica [B] time = 0.67, size = 246, normalized size = 3.15

$$\frac{a^4(\cos(c+dx)+i\sin(c+dx))^4\left(6i\sin(3c)\sin(dx)-2i\sin(c)\sin(3dx)-2\sin(c)\cos(3dx)+6\sin(3c)\cos(dx)+\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (a^4*(-3*Cos[4*c]*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + 3*Cos[4*c]*Log
[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] - 2*Cos[3*d*x]*Sin[c] + 6*Cos[d*x]*Si
n[3*c] + (3*I)*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]]*Sin[4*c] - (3*I)*Lo
g[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]*Sin[4*c] + Cos[3*c]*((6*I)*Cos[d*x]
- 6*Sin[d*x]) + (6*I)*Sin[3*c]*Sin[d*x] - (2*I)*Sin[c]*Sin[3*d*x] + 2*Cos[c
]*((-I)*Cos[3*d*x] + Sin[3*d*x]))*(Cos[c + d*x] + I*Sin[c + d*x])^4)/(3*d*(
Cos[d*x] + I*Sin[d*x])^4)
```

fricas [A] time = 0.58, size = 68, normalized size = 0.87

$$\frac{-2i\,a^4e^{(3i\,dx+3i\,c)}+6i\,a^4e^{(i\,dx+i\,c)}+3\,a^4\log\left(e^{(i\,dx+i\,c)}+i\right)-3\,a^4\log\left(e^{(i\,dx+i\,c)}-i\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

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

giac [B] time = 3.39, size = 1299, normalized size = 16.65

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/768*(1110*a^4*e^(12*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*c) + 1) + 6660*a^4*
e^(10*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 16650*a^4*e^(8*I*d*x + 2*
I*c)*log(I*e^(I*d*x + I*c) + 1) + 16650*a^4*e^(4*I*d*x - 2*I*c)*log(I*e^(I*
d*x + I*c) + 1) + 6660*a^4*e^(2*I*d*x - 4*I*c)*log(I*e^(I*d*x + I*c) + 1) +
 22200*a^4*e^(6*I*d*x)*log(I*e^(I*d*x + I*c) + 1) + 1110*a^4*e^(-6*I*c)*log
(I*e^(I*d*x + I*c) + 1) + 1875*a^4*e^(12*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*
c) - 1) + 11250*a^4*e^(10*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) - 1) + 28125
*a^4*e^(8*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) - 1) + 28125*a^4*e^(4*I*d*x
- 2*I*c)*log(I*e^(I*d*x + I*c) - 1) + 11250*a^4*e^(2*I*d*x - 4*I*c)*log(I*e
^(I*d*x + I*c) - 1) + 37500*a^4*e^(6*I*d*x)*log(I*e^(I*d*x + I*c) - 1) + 18
75*a^4*e^(-6*I*c)*log(I*e^(I*d*x + I*c) - 1) - 1110*a^4*e^(12*I*d*x + 6*I*c
)*log(-I*e^(I*d*x + I*c) + 1) - 6660*a^4*e^(10*I*d*x + 4*I*c)*log(-I*e^(I*d
*x + I*c) + 1) - 16650*a^4*e^(8*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) + 1)
- 16650*a^4*e^(4*I*d*x - 2*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 6660*a^4*e^(2
*I*d*x - 4*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 22200*a^4*e^(6*I*d*x)*log(-I*
e^(I*d*x + I*c) + 1) - 1110*a^4*e^(-6*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 18
75*a^4*e^(12*I*d*x + 6*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 11250*a^4*e^(10*I
*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 28125*a^4*e^(8*I*d*x + 2*I*c)*l
og(-I*e^(I*d*x + I*c) - 1) - 28125*a^4*e^(4*I*d*x - 2*I*c)*log(-I*e^(I*d*x
+ I*c) - 1) - 11250*a^4*e^(2*I*d*x - 4*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 3
7500*a^4*e^(6*I*d*x)*log(-I*e^(I*d*x + I*c) - 1) - 1875*a^4*e^(-6*I*c)*log(
-I*e^(I*d*x + I*c) - 1) - 3*a^4*e^(12*I*d*x + 6*I*c)*log(I*e^(I*d*x) + e^(-
I*c)) - 18*a^4*e^(10*I*d*x + 4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 45*a^4*e^
(8*I*d*x + 2*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 45*a^4*e^(4*I*d*x - 2*I*c)*
log(I*e^(I*d*x) + e^(-I*c)) - 18*a^4*e^(2*I*d*x - 4*I*c)*log(I*e^(I*d*x) +
e^(-I*c)) - 60*a^4*e^(6*I*d*x)*log(I*e^(I*d*x) + e^(-I*c)) - 3*a^4*e^(-6*I*
c)*log(I*e^(I*d*x) + e^(-I*c)) + 3*a^4*e^(12*I*d*x + 6*I*c)*log(-I*e^(I*d*x
) + e^(-I*c)) + 18*a^4*e^(10*I*d*x + 4*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) +
45*a^4*e^(8*I*d*x + 2*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 45*a^4*e^(4*I*d*x
 - 2*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 18*a^4*e^(2*I*d*x - 4*I*c)*log(-I*
e^(I*d*x) + e^(-I*c)) + 60*a^4*e^(6*I*d*x)*log(-I*e^(I*d*x) + e^(-I*c)) + 3
*a^4*e^(-6*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 512*I*a^4*e^(15*I*d*x + 9*I*
```

```
c) - 1536*I*a^4*e^(13*I*d*x + 7*I*c) + 1536*I*a^4*e^(11*I*d*x + 5*I*c) + 12
800*I*a^4*e^(9*I*d*x + 3*I*c) + 23040*I*a^4*e^(7*I*d*x + I*c) + 19968*I*a^4
*e^(5*I*d*x - I*c) + 8704*I*a^4*e^(3*I*d*x - 3*I*c) + 1536*I*a^4*e^(I*d*x -
 5*I*c))/(d*e^(12*I*d*x + 6*I*c) + 6*d*e^(10*I*d*x + 4*I*c) + 15*d*e^(8*I*d
*x + 2*I*c) + 15*d*e^(4*I*d*x - 2*I*c) + 6*d*e^(2*I*d*x - 4*I*c) + 20*d*e^(
6*I*d*x) + d*e^(-6*I*c))
```

maple [A] time = 0.45, size = 130, normalized size = 1.67

$$-\frac{7a^4\left(\sin^3(dx+c)\right)}{3d}-\frac{a^4\sin(dx+c)}{3d}+\frac{a^4\ln(\sec(dx+c)+\tan(dx+c))}{d}+\frac{4ia^4\cos(dx+c)\left(\sin^2(dx+c)\right)}{3d}+\frac{8ia^4 c}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] -7/3*a^4*sin(d*x+c)^3/d-1/3*a^4*sin(d*x+c)/d+1/d*a^4*ln(sec(d*x+c)+tan(d*x+
c))+4/3*I/d*a^4*cos(d*x+c)*sin(d*x+c)^2+8/3*I/d*a^4*cos(d*x+c)-4/3*I/d*a^4*
cos(d*x+c)^3+1/3/d*sin(d*x+c)*cos(d*x+c)^2*a^4
```

maxima [A] time = 0.42, size = 121, normalized size = 1.55

$$-\frac{8i\,a^4\cos(dx+c)^3+12\,a^4\sin(dx+c)^3+8i\left(\cos(dx+c)^3-3\,\cos(dx+c)\right)a^4+\left(2\,\sin(dx+c)^3-3\,\log(\sin(d\right.}{6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] -1/6*(8*I*a^4*cos(d*x + c)^3 + 12*a^4*sin(d*x + c)^3 + 8*I*(cos(d*x + c)^3
- 3*cos(d*x + c))*a^4 + (2*sin(d*x + c)^3 - 3*log(sin(d*x + c) + 1) + 3*log
(sin(d*x + c) - 1) + 6*sin(d*x + c))*a^4 + 2*(sin(d*x + c)^3 - 3*sin(d*x +
c))*a^4)/d
```

mupad [B] time = 3.56, size = 88, normalized size = 1.13

$$\frac{2\,a^4\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d}-\frac{\frac{8\,a^4}{3}-a^4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,8\mathrm{i}}{d\,\left(-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2\,3\mathrm{i}+3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+1\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^4,x)
```

```
[Out] (2*a^4*atanh(tan(c/2 + (d*x)/2)))/d - ((8*a^4)/3 - a^4*tan(c/2 + (d*x)/2)*8
i)/(d*(3*tan(c/2 + (d*x)/2) - tan(c/2 + (d*x)/2)^2*3i - tan(c/2 + (d*x)/2)^
3 + 1i))
```

sympy [A] time = 0.45, size = 110, normalized size = 1.41

$$\frac{a^4\left(-\log\left(e^{idx}-ie^{-ic}\right)+\log\left(e^{idx}+ie^{-ic}\right)\right)}{d}+\begin{cases}\frac{-2ia^4de^{3ic}e^{3idx}+6ia^4de^{ic}e^{idx}}{3d^2} & \text{for } 3d^2\neq 0\\ x\left(2a^4e^{3ic}-2a^4e^{ic}\right) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3*(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] a**4*(-log(exp(I*d*x) - I*exp(-I*c)) + log(exp(I*d*x) + I*exp(-I*c)))/d + P
iecewise(((-2*I*a**4*d*exp(3*I*c)*exp(3*I*d*x) + 6*I*a**4*d*exp(I*c)*exp(I*
d*x))/(3*d**2), Ne(3*d**2, 0)), (x*(2*a**4*exp(3*I*c) - 2*a**4*exp(I*c)), T
rue))
```

3.56 $\int \cos^5(c+dx)(a+ia\tan(c+dx))^4\,dx$

Optimal. Leaf size=66

$$-\frac{i\cos^5(c+dx)(a+ia\tan(c+dx))^4}{5d}-\frac{ia\cos^3(c+dx)(a+ia\tan(c+dx))^3}{15d}$$

```
[Out] -1/15*I*a*cos(d*x+c)^3*(a+I*a*tan(d*x+c))^3/d-1/5*I*cos(d*x+c)^5*(a+I*a*tan
(d*x+c))^4/d
```

Rubi [A] time = 0.07, antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3497, 3488}

$$-\frac{i\cos^5(c+dx)(a+ia\tan(c+dx))^4}{5d}-\frac{ia\cos^3(c+dx)(a+ia\tan(c+dx))^3}{15d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] ((-I/15)*a*Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^3)/d - ((I/5)*Cos[c + d*x]
^5*(a + I*a*Tan[c + d*x])^4)/d
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rubi steps

$$\int \cos^5(c+dx)(a+ia\tan(c+dx))^4\,dx=-\frac{i\cos^5(c+dx)(a+ia\tan(c+dx))^4}{5d}+\frac{1}{5}a\int \cos^3(c+dx)(a+ia\tan$$
$$=-\frac{ia\cos^3(c+dx)(a+ia\tan(c+dx))^3}{15d}-\frac{i\cos^5(c+dx)(a+ia\tan(c+}{5d}$$

Mathematica [A] time = 0.41, size = 50, normalized size = 0.76

$$\frac{a^4(4\cos(c+dx)-i\sin(c+dx))(\sin(4(c+dx))-i\cos(4(c+dx)))}{15d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (a^4*(4*Cos[c + d*x] - I*Sin[c + d*x])*((-I)*Cos[4*(c + d*x)] + Sin[4*(c +
d*x)]))/(15*d)
```

fricas [A] time = 0.62, size = 34, normalized size = 0.52

$$\frac{-3i\,a^4e^{(5i\,dx+5i\,c)} - 5i\,a^4e^{(3i\,dx+3i\,c)}}{30\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/30*(-3*I*a^4*e^(5*I*d*x + 5*I*c) - 5*I*a^4*e^(3*I*d*x + 3*I*c))/d
```

giac [B] time = 4.03, size = 915, normalized size = 13.86

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/7680*(9075*a^4*e^(8*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 36300*a^4
*e^(6*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) + 1) + 36300*a^4*e^(2*I*d*x - 2*
I*c)*log(I*e^(I*d*x + I*c) + 1) + 54450*a^4*e^(4*I*d*x)*log(I*e^(I*d*x + I*
c) + 1) + 9075*a^4*e^(-4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 9000*a^4*e^(8*I*
d*x + 4*I*c)*log(I*e^(I*d*x + I*c) - 1) + 36000*a^4*e^(6*I*d*x + 2*I*c)*log
(I*e^(I*d*x + I*c) - 1) + 36000*a^4*e^(2*I*d*x - 2*I*c)*log(I*e^(I*d*x + I*
c) - 1) + 54000*a^4*e^(4*I*d*x)*log(I*e^(I*d*x + I*c) - 1) + 9000*a^4*e^(-4
*I*c)*log(I*e^(I*d*x + I*c) - 1) - 9075*a^4*e^(8*I*d*x + 4*I*c)*log(-I*e^(I
*d*x + I*c) + 1) - 36300*a^4*e^(6*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) + 1
) - 36300*a^4*e^(2*I*d*x - 2*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 54450*a^4*e
^(4*I*d*x)*log(-I*e^(I*d*x + I*c) + 1) - 9075*a^4*e^(-4*I*c)*log(-I*e^(I*d*
x + I*c) + 1) - 9000*a^4*e^(8*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) - 1) -
36000*a^4*e^(6*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 36000*a^4*e^(2*
I*d*x - 2*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 54000*a^4*e^(4*I*d*x)*log(-I*e
^(I*d*x + I*c) - 1) - 9000*a^4*e^(-4*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 75*
a^4*e^(8*I*d*x + 4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 300*a^4*e^(6*I*d*x +
2*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 300*a^4*e^(2*I*d*x - 2*I*c)*log(I*e^(I
*d*x) + e^(-I*c)) - 450*a^4*e^(4*I*d*x)*log(I*e^(I*d*x) + e^(-I*c)) - 75*a^
4*e^(-4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 75*a^4*e^(8*I*d*x + 4*I*c)*log(-
I*e^(I*d*x) + e^(-I*c)) + 300*a^4*e^(6*I*d*x + 2*I*c)*log(-I*e^(I*d*x) + e^
(-I*c)) + 300*a^4*e^(2*I*d*x - 2*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 450*a^
4*e^(4*I*d*x)*log(-I*e^(I*d*x) + e^(-I*c)) + 75*a^4*e^(-4*I*c)*log(-I*e^(I*
d*x) + e^(-I*c)) - 768*I*a^4*e^(13*I*d*x + 9*I*c) - 4352*I*a^4*e^(11*I*d*x
+ 7*I*c) - 9728*I*a^4*e^(9*I*d*x + 5*I*c) - 10752*I*a^4*e^(7*I*d*x + 3*I*c)
 - 5888*I*a^4*e^(5*I*d*x + I*c) - 1280*I*a^4*e^(3*I*d*x - I*c))/(d*e^(8*I*d
*x + 4*I*c) + 4*d*e^(6*I*d*x + 2*I*c) + 4*d*e^(2*I*d*x - 2*I*c) + 6*d*e^(4*
I*d*x) + d*e^(-4*I*c))
```

maple [B] time = 0.51, size = 139, normalized size = 2.11

$$\frac{\frac{a^4\left(\sin^5(dx+c)\right)}{5} - 4ia^4\left(-\frac{\left(\cos^3(dx+c)\right)\left(\sin^2(dx+c)\right)}{5} - \frac{2\left(\cos^3(dx+c)\right)}{15}\right) - 6a^4\left(-\frac{\sin(dx+c)\left(\cos^4(dx+c)\right)}{5} + \frac{\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{15}\right) - \frac{4ia}{}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 1/d*(1/5*a^4*sin(d*x+c)^5-4*I*a^4*(-1/5*cos(d*x+c)^3*sin(d*x+c)^2-2/15*cos(
d*x+c)^3)-6*a^4*(-1/5*sin(d*x+c)*cos(d*x+c)^4+1/15*(2+cos(d*x+c)^2)*sin(d*x
+c))-4/5*I*a^4*cos(d*x+c)^5+1/5*a^4*(8/3+cos(d*x+c)^4+4/3*cos(d*x+c)^2)*sin
(d*x+c))
```

maxima [B] time = 0.40, size = 118, normalized size = 1.79

$$-\frac{12i\,a^4\cos\left(dx+c\right)^5-3\,a^4\sin\left(dx+c\right)^5+4i\left(3\,\cos\left(dx+c\right)^5-5\,\cos\left(dx+c\right)^3\right)a^4-6\left(3\,\sin\left(dx+c\right)^5-5\,\sin\right.}{15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] -1/15*(12*I*a^4*cos(d*x + c)^5 - 3*a^4*sin(d*x + c)^5 + 4*I*(3*cos(d*x + c)
^5 - 5*cos(d*x + c)^3)*a^4 - 6*(3*sin(d*x + c)^5 - 5*sin(d*x + c)^3)*a^4 -
(3*sin(d*x + c)^5 - 10*sin(d*x + c)^3 + 15*sin(d*x + c))*a^4)/d
```

mupad [B] time = 3.55, size = 130, normalized size = 1.97

$$\frac{2\,a^4\,\left(15\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3\,15\mathrm{i}-25\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,5\mathrm{i}+4\right)}{15\,d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4\,5\mathrm{i}-10\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2\,10\mathrm{i}+5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+1\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^4,x)
```

```
[Out] (2*a^4*(tan(c/2 + (d*x)/2)^3*15i - 25*tan(c/2 + (d*x)/2)^2 - tan(c/2 + (d*x
)/2)*5i + 15*tan(c/2 + (d*x)/2)^4 + 4))/(15*d*(5*tan(c/2 + (d*x)/2) - tan(c
/2 + (d*x)/2)^2*10i - 10*tan(c/2 + (d*x)/2)^3 + tan(c/2 + (d*x)/2)^4*5i + t
an(c/2 + (d*x)/2)^5 + 1i))
```

sympy [A] time = 0.42, size = 82, normalized size = 1.24

$$\begin{cases} \frac{-6ia^4de^{5ic}e^{5idx}-10ia^4de^{3ic}e^{3idx}}{60d^2} & \text{for}\ 60d^2\neq 0 \\ x\left(\frac{a^4e^{5ic}}{2}+\frac{a^4e^{3ic}}{2}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**5*(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Piecewise(((-6*I*a**4*d*exp(5*I*c)*exp(5*I*d*x) - 10*I*a**4*d*exp(3*I*c)*ex
p(3*I*d*x))/(60*d**2), Ne(60*d**2, 0)), (x*(a**4*exp(5*I*c)/2 + a**4*exp(3*
I*c)/2), True))
```

3.57 $\int \cos^7(c+dx)(a+ia\tan(c+dx))^4\,dx$

Optimal. Leaf size=102

$$-\frac{a^4\sin^3(c+dx)}{35d}+\frac{3a^4\sin(c+dx)}{35d}-\frac{2i\cos^5(c+dx)\left(a^4+ia^4\tan(c+dx)\right)}{35d}-\frac{2ia\cos^7(c+dx)(a+ia\tan(c+dx))^3}{7d}$$

```
[Out] 3/35*a^4*sin(d*x+c)/d-1/35*a^4*sin(d*x+c)^3/d-2/7*I*a*cos(d*x+c)^7*(a+I*a*t
an(d*x+c))^3/d-2/35*I*cos(d*x+c)^5*(a^4+I*a^4*tan(d*x+c))/d
```

Rubi [A] time = 0.09, antiderivative size = 102, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3496, 2633}

$$-\frac{a^4\sin^3(c+dx)}{35d}+\frac{3a^4\sin(c+dx)}{35d}-\frac{2i\cos^5(c+dx)\left(a^4+ia^4\tan(c+dx)\right)}{35d}-\frac{2ia\cos^7(c+dx)(a+ia\tan(c+dx))^3}{7d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^7*(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (3*a^4*Sin[c + d*x])/(35*d) - (a^4*Sin[c + d*x]^3)/(35*d) - (((2*I)/7)*a*Co
s[c + d*x]^7*(a + I*a*Tan[c + d*x])^3)/d - (((2*I)/35)*Cos[c + d*x]^5*(a^4
+ I*a^4*Tan[c + d*x]))/d
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rubi steps

$$\begin{aligned}\int \cos^7(c+dx)(a+ia\tan(c+dx))^4\,dx &= -\frac{2ia\cos^7(c+dx)(a+ia\tan(c+dx))^3}{7d}+\frac{1}{7}a^2\int \cos^5(c+dx)(a+ia\tan\\ &= -\frac{2ia\cos^7(c+dx)(a+ia\tan(c+dx))^3}{7d}-\frac{2i\cos^5(c+dx)\left(a^4+ia^4\tan(c\right.}{35d}\\ &= -\frac{2ia\cos^7(c+dx)(a+ia\tan(c+dx))^3}{7d}-\frac{2i\cos^5(c+dx)\left(a^4+ia^4\tan(c\right.}{35d}\\ &= \frac{3a^4\sin(c+dx)}{35d}-\frac{a^4\sin^3(c+dx)}{35d}-\frac{2ia\cos^7(c+dx)(a+ia\tan(c+dx)}{7d}\end{aligned}$$

Mathematica [A] time = 0.85, size = 73, normalized size = 0.72

$$\frac{a^4(-i(7\sin(c+dx)+15\sin(3(c+dx)))+28\cos(c+dx)+20\cos(3(c+dx)))(\sin(4(c+dx))-i\cos(4(c+dx)))}{140d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^7*(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (a^4*(28*Cos[c + d*x] + 20*Cos[3*(c + d*x)] - I*(7*Sin[c + d*x] + 15*Sin[3*
(c + d*x)]))*((-I)*Cos[4*(c + d*x)] + Sin[4*(c + d*x)]))/(140*d)
```

fricas [A] time = 0.72, size = 62, normalized size = 0.61

$$\frac{-5i\, a^4 e^{(7i\, dx+7i\, c)} - 21i\, a^4 e^{(5i\, dx+5i\, c)} - 35i\, a^4 e^{(3i\, dx+3i\, c)} - 35i\, a^4 e^{(i\, dx+i\, c)}}{280\, d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/280*(-5*I*a^4*e^(7*I*d*x + 7*I*c) - 21*I*a^4*e^(5*I*d*x + 5*I*c) - 35*I*a
^4*e^(3*I*d*x + 3*I*c) - 35*I*a^4*e^(I*d*x + I*c))/d
```

giac [B] time = 4.41, size = 1327, normalized size = 13.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/143360*(89950*a^4*e^(12*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*c) + 1) + 53970
0*a^4*e^(10*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 1349250*a^4*e^(8*I*
d*x + 2*I*c)*log(I*e^(I*d*x + I*c) + 1) + 1349250*a^4*e^(4*I*d*x - 2*I*c)*l
og(I*e^(I*d*x + I*c) + 1) + 539700*a^4*e^(2*I*d*x - 4*I*c)*log(I*e^(I*d*x +
 I*c) + 1) + 1799000*a^4*e^(6*I*d*x)*log(I*e^(I*d*x + I*c) + 1) + 89950*a^4
*e^(-6*I*c)*log(I*e^(I*d*x + I*c) + 1) + 86065*a^4*e^(12*I*d*x + 6*I*c)*log
(I*e^(I*d*x + I*c) - 1) + 516390*a^4*e^(10*I*d*x + 4*I*c)*log(I*e^(I*d*x +
I*c) - 1) + 1290975*a^4*e^(8*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) - 1) + 12
90975*a^4*e^(4*I*d*x - 2*I*c)*log(I*e^(I*d*x + I*c) - 1) + 516390*a^4*e^(2*
I*d*x - 4*I*c)*log(I*e^(I*d*x + I*c) - 1) + 1721300*a^4*e^(6*I*d*x)*log(I*e
^(I*d*x + I*c) - 1) + 86065*a^4*e^(-6*I*c)*log(I*e^(I*d*x + I*c) - 1) - 899
50*a^4*e^(12*I*d*x + 6*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 539700*a^4*e^(10*
I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 1349250*a^4*e^(8*I*d*x + 2*I*c
)*log(-I*e^(I*d*x + I*c) + 1) - 1349250*a^4*e^(4*I*d*x - 2*I*c)*log(-I*e^(I
*d*x + I*c) + 1) - 539700*a^4*e^(2*I*d*x - 4*I*c)*log(-I*e^(I*d*x + I*c) +
1) - 1799000*a^4*e^(6*I*d*x)*log(-I*e^(I*d*x + I*c) + 1) - 89950*a^4*e^(-6*
I*c)*log(-I*e^(I*d*x + I*c) + 1) - 86065*a^4*e^(12*I*d*x + 6*I*c)*log(-I*e^
(I*d*x + I*c) - 1) - 516390*a^4*e^(10*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c)
 - 1) - 1290975*a^4*e^(8*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 12909
75*a^4*e^(4*I*d*x - 2*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 516390*a^4*e^(2*I*
d*x - 4*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 1721300*a^4*e^(6*I*d*x)*log(-I*e
^(I*d*x + I*c) - 1) - 86065*a^4*e^(-6*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 38
85*a^4*e^(12*I*d*x + 6*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 23310*a^4*e^(10*I
*d*x + 4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 58275*a^4*e^(8*I*d*x + 2*I*c)*l
og(I*e^(I*d*x) + e^(-I*c)) - 58275*a^4*e^(4*I*d*x - 2*I*c)*log(I*e^(I*d*x)
+ e^(-I*c)) - 23310*a^4*e^(2*I*d*x - 4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 7
7700*a^4*e^(6*I*d*x)*log(I*e^(I*d*x) + e^(-I*c)) - 3885*a^4*e^(-6*I*c)*log(
I*e^(I*d*x) + e^(-I*c)) + 3885*a^4*e^(12*I*d*x + 6*I*c)*log(-I*e^(I*d*x) +
e^(-I*c)) + 23310*a^4*e^(10*I*d*x + 4*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 5
8275*a^4*e^(8*I*d*x + 2*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 58275*a^4*e^(4*
I*d*x - 2*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 23310*a^4*e^(2*I*d*x - 4*I*c)
*log(-I*e^(I*d*x) + e^(-I*c)) + 77700*a^4*e^(6*I*d*x)*log(-I*e^(I*d*x) + e^
(-I*c)) + 3885*a^4*e^(-6*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 2560*I*a^4*e^(
19*I*d*x + 13*I*c) - 26112*I*a^4*e^(17*I*d*x + 11*I*c) - 120832*I*a^4*e^(15
*I*d*x + 9*I*c) - 337920*I*a^4*e^(13*I*d*x + 7*I*c) - 629760*I*a^4*e^(11*I*
```

```
d*x + 5*I*c) - 803840*I*a^4*e^(9*I*d*x + 3*I*c) - 694272*I*a^4*e^(7*I*d*x +
 I*c) - 387072*I*a^4*e^(5*I*d*x - I*c) - 125440*I*a^4*e^(3*I*d*x - 3*I*c) -
 17920*I*a^4*e^(I*d*x - 5*I*c))/(d*e^(12*I*d*x + 6*I*c) + 6*d*e^(10*I*d*x +
 4*I*c) + 15*d*e^(8*I*d*x + 2*I*c) + 15*d*e^(4*I*d*x - 2*I*c) + 6*d*e^(2*I*
d*x - 4*I*c) + 20*d*e^(6*I*d*x) + d*e^(-6*I*c))
```

maple [B] time = 0.59, size = 203, normalized size = 1.99

$$\frac{a^4\left(-\frac{(\sin^3(dx+c))(\cos^4(dx+c))}{7}-\frac{3\sin(dx+c)(\cos^4(dx+c))}{35}+\frac{(2+\cos^2(dx+c))\sin(dx+c)}{35}\right)-4ia^4\left(-\frac{(\sin^2(dx+c))(\cos^5(dx+c))}{7}-\frac{2(\cos^5(dx+c}{35}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 1/d*(a^4*(-1/7*sin(d*x+c)^3*cos(d*x+c)^4-3/35*sin(d*x+c)*cos(d*x+c)^4+1/35*
(2+cos(d*x+c)^2)*sin(d*x+c))-4*I*a^4*(-1/7*sin(d*x+c)^2*cos(d*x+c)^5-2/35*c
os(d*x+c)^5)-6*a^4*(-1/7*sin(d*x+c)*cos(d*x+c)^6+1/35*(8/3+cos(d*x+c)^4+4/3
*cos(d*x+c)^2)*sin(d*x+c))-4/7*I*a^4*cos(d*x+c)^7+1/7*a^4*(16/5+cos(d*x+c)^
6+6/5*cos(d*x+c)^4+8/5*cos(d*x+c)^2)*sin(d*x+c))
```

maxima [A] time = 0.65, size = 149, normalized size = 1.46

$$-\frac{20i\,a^4\cos(dx+c)^7+4i\left(5\cos(dx+c)^7-7\cos(dx+c)^5\right)a^4+2\left(15\sin(dx+c)^7-42\sin(dx+c)^5+35\sin(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] -1/35*(20*I*a^4*cos(d*x + c)^7 + 4*I*(5*cos(d*x + c)^7 - 7*cos(d*x + c)^5)*
a^4 + 2*(15*sin(d*x + c)^7 - 42*sin(d*x + c)^5 + 35*sin(d*x + c)^3)*a^4 + (
5*sin(d*x + c)^7 - 7*sin(d*x + c)^5)*a^4 + (5*sin(d*x + c)^7 - 21*sin(d*x +
 c)^5 + 35*sin(d*x + c)^3 - 35*sin(d*x + c))*a^4)/d
```

mupad [B] time = 4.27, size = 186, normalized size = 1.82

$$-\frac{2a^4\left(35\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^6+\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^5105\mathrm{i}-210\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^4-\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^3210\mathrm{i}+147\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^2\right.}{35d\left(-\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^7-\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^67\mathrm{i}+21\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^5+\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^435\mathrm{i}-35\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^3-\tan\left(\frac{c}{2}+\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^7*(a + a*tan(c + d*x)*1i)^4,x)
```

```
[Out] -(2*a^4*(tan(c/2 + (d*x)/2)*49i + 147*tan(c/2 + (d*x)/2)^2 - tan(c/2 + (d*x
)/2)^3*210i - 210*tan(c/2 + (d*x)/2)^4 + tan(c/2 + (d*x)/2)^5*105i + 35*tan
(c/2 + (d*x)/2)^6 - 12))/(35*d*(7*tan(c/2 + (d*x)/2) - tan(c/2 + (d*x)/2)^2
*21i - 35*tan(c/2 + (d*x)/2)^3 + tan(c/2 + (d*x)/2)^4*35i + 21*tan(c/2 + (d
*x)/2)^5 - tan(c/2 + (d*x)/2)^6*7i - tan(c/2 + (d*x)/2)^7 + 1i))
```

sympy [A] time = 0.56, size = 158, normalized size = 1.55

$$\begin{cases}\frac{-2560ia^4d^3e^{7ic}e^{7idx}-10752ia^4d^3e^{5ic}e^{5idx}-17920ia^4d^3e^{3ic}e^{3idx}-17920ia^4d^3e^{ic}e^{idx}}{143360d^4} & \text{for } 143360d^4\neq 0\\ x\left(\frac{a^4e^{7ic}}{8}+\frac{3a^4e^{5ic}}{8}+\frac{3a^4e^{3ic}}{8}+\frac{a^4e^{ic}}{8}\right) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**7*(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Piecewise(((-2560*I*a**4*d**3*exp(7*I*c)*exp(7*I*d*x) - 10752*I*a**4*d**3*e
xp(5*I*c)*exp(5*I*d*x) - 17920*I*a**4*d**3*exp(3*I*c)*exp(3*I*d*x) - 17920*
I*a**4*d**3*exp(I*c)*exp(I*d*x))/(143360*d**4), Ne(143360*d**4, 0)), (x*(a*
*4*exp(7*I*c)/8 + 3*a**4*exp(5*I*c)/8 + 3*a**4*exp(3*I*c)/8 + a**4*exp(I*c)
/8), True))
```

3.58 $\int \cos^9(c+dx)(a+ia\tan(c+dx))^4\,dx$

Optimal. Leaf size=120

$$\frac{a^4\sin^5(c+dx)}{21d}-\frac{10a^4\sin^3(c+dx)}{63d}+\frac{5a^4\sin(c+dx)}{21d}-\frac{2i\cos^7(c+dx)\left(a^4+ia^4\tan(c+dx)\right)}{21d}-\frac{2ia\cos^9(c+dx)(a+$$

```
[Out] 5/21*a^4*sin(d*x+c)/d-10/63*a^4*sin(d*x+c)^3/d+1/21*a^4*sin(d*x+c)^5/d-2/9*
I*a*cos(d*x+c)^9*(a+I*a*tan(d*x+c))^3/d-2/21*I*cos(d*x+c)^7*(a^4+I*a^4*tan(
d*x+c))/d
```

Rubi [A] time = 0.10, antiderivative size = 120, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {3496, 2633}

$$\frac{a^4\sin^5(c+dx)}{21d}-\frac{10a^4\sin^3(c+dx)}{63d}+\frac{5a^4\sin(c+dx)}{21d}-\frac{2i\cos^7(c+dx)\left(a^4+ia^4\tan(c+dx)\right)}{21d}-\frac{2ia\cos^9(c+dx)(a+$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^9*(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (5*a^4*Sin[c + d*x])/(21*d) - (10*a^4*Sin[c + d*x]^3)/(63*d) + (a^4*Sin[c +
 d*x]^5)/(21*d) - (((2*I)/9)*a*Cos[c + d*x]^9*(a + I*a*Tan[c + d*x])^3)/d -
 (((2*I)/21)*Cos[c + d*x]^7*(a^4 + I*a^4*Tan[c + d*x]))/d
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rubi steps

$$\begin{aligned}\int \cos^9(c+dx)(a+ia\tan(c+dx))^4\,dx &= -\frac{2ia\cos^9(c+dx)(a+ia\tan(c+dx))^3}{9d}+\frac{1}{3}a^2\int \cos^7(c+dx)(a+ia\tan\\ &= -\frac{2ia\cos^9(c+dx)(a+ia\tan(c+dx))^3}{9d}-\frac{2i\cos^7(c+dx)\left(a^4+ia^4\tan(c\right.}{21d}\\ &= -\frac{2ia\cos^9(c+dx)(a+ia\tan(c+dx))^3}{9d}-\frac{2i\cos^7(c+dx)\left(a^4+ia^4\tan(c\right.}{21d}\\ &= \frac{5a^4\sin(c+dx)}{21d}-\frac{10a^4\sin^3(c+dx)}{63d}+\frac{a^4\sin^5(c+dx)}{21d}-\frac{2ia\cos^9(c+d}{}\end{aligned}$$

Mathematica [A] time = 0.87, size = 111, normalized size = 0.92

$$\frac{a^4(-42\sin(c+dx)-135\sin(3(c+dx))+35\sin(5(c+dx))-168i\cos(c+dx)-180i\cos(3(c+dx))+28i\cos(5(}{1008d(\cos(dx)+i\sin(dx))^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^9*(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (a^4*((-168*I)*Cos[c + d*x] - (180*I)*Cos[3*(c + d*x)] + (28*I)*Cos[5*(c +
d*x)] - 42*Sin[c + d*x] - 135*Sin[3*(c + d*x)] + 35*Sin[5*(c + d*x)])*(Cos[
4*(c + 2*d*x)] + I*Sin[4*(c + 2*d*x)]))/(1008*d*(Cos[d*x] + I*Sin[d*x])^4)
```

fricas [A] time = 0.58, size = 90, normalized size = 0.75

$$\frac{\left(-7 i a^4 e^{(10 i dx+10 i c)} - 45 i a^4 e^{(8 i dx+8 i c)} - 126 i a^4 e^{(6 i dx+6 i c)} - 210 i a^4 e^{(4 i dx+4 i c)} - 315 i a^4 e^{(2 i dx+2 i c)} + 63 i a^4\right) e^{(-i dx-}}{2016 d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/2016*(-7*I*a^4*e^(10*I*d*x + 10*I*c) - 45*I*a^4*e^(8*I*d*x + 8*I*c) - 126
*I*a^4*e^(6*I*d*x + 6*I*c) - 210*I*a^4*e^(4*I*d*x + 4*I*c) - 315*I*a^4*e^(2
*I*d*x + 2*I*c) + 63*I*a^4)*e^(-I*d*x - I*c)/d
```

giac [B] time = 5.14, size = 1409, normalized size = 11.74

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/516096*(435267*a^4*e^(13*I*d*x + 7*I*c)*log(I*e^(I*d*x + I*c) + 1) + 2611
602*a^4*e^(11*I*d*x + 5*I*c)*log(I*e^(I*d*x + I*c) + 1) + 6529005*a^4*e^(9*
I*d*x + 3*I*c)*log(I*e^(I*d*x + I*c) + 1) + 8705340*a^4*e^(7*I*d*x + I*c)*l
og(I*e^(I*d*x + I*c) + 1) + 6529005*a^4*e^(5*I*d*x - I*c)*log(I*e^(I*d*x +
I*c) + 1) + 2611602*a^4*e^(3*I*d*x - 3*I*c)*log(I*e^(I*d*x + I*c) + 1) + 43
5267*a^4*e^(I*d*x - 5*I*c)*log(I*e^(I*d*x + I*c) + 1) + 427896*a^4*e^(13*I*
d*x + 7*I*c)*log(I*e^(I*d*x + I*c) - 1) + 2567376*a^4*e^(11*I*d*x + 5*I*c)*
log(I*e^(I*d*x + I*c) - 1) + 6418440*a^4*e^(9*I*d*x + 3*I*c)*log(I*e^(I*d*x
 + I*c) - 1) + 8557920*a^4*e^(7*I*d*x + I*c)*log(I*e^(I*d*x + I*c) - 1) + 6
418440*a^4*e^(5*I*d*x - I*c)*log(I*e^(I*d*x + I*c) - 1) + 2567376*a^4*e^(3*
I*d*x - 3*I*c)*log(I*e^(I*d*x + I*c) - 1) + 427896*a^4*e^(I*d*x - 5*I*c)*lo
g(I*e^(I*d*x + I*c) - 1) - 435267*a^4*e^(13*I*d*x + 7*I*c)*log(-I*e^(I*d*x
+ I*c) + 1) - 2611602*a^4*e^(11*I*d*x + 5*I*c)*log(-I*e^(I*d*x + I*c) + 1)
- 6529005*a^4*e^(9*I*d*x + 3*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 8705340*a^4
*e^(7*I*d*x + I*c)*log(-I*e^(I*d*x + I*c) + 1) - 6529005*a^4*e^(5*I*d*x - I
*c)*log(-I*e^(I*d*x + I*c) + 1) - 2611602*a^4*e^(3*I*d*x - 3*I*c)*log(-I*e^
(I*d*x + I*c) + 1) - 435267*a^4*e^(I*d*x - 5*I*c)*log(-I*e^(I*d*x + I*c) +
1) - 427896*a^4*e^(13*I*d*x + 7*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 2567376*
a^4*e^(11*I*d*x + 5*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 6418440*a^4*e^(9*I*d
*x + 3*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 8557920*a^4*e^(7*I*d*x + I*c)*log
(-I*e^(I*d*x + I*c) - 1) - 6418440*a^4*e^(5*I*d*x - I*c)*log(-I*e^(I*d*x +
I*c) - 1) - 2567376*a^4*e^(3*I*d*x - 3*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 4
27896*a^4*e^(I*d*x - 5*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 7371*a^4*e^(13*I*
d*x + 7*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 44226*a^4*e^(11*I*d*x + 5*I*c)*l
og(I*e^(I*d*x) + e^(-I*c)) - 110565*a^4*e^(9*I*d*x + 3*I*c)*log(I*e^(I*d*x)
 + e^(-I*c)) - 147420*a^4*e^(7*I*d*x + I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 1
10565*a^4*e^(5*I*d*x - I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 44226*a^4*e^(3*I*
d*x - 3*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 7371*a^4*e^(I*d*x - 5*I*c)*log(I
*e^(I*d*x) + e^(-I*c)) + 7371*a^4*e^(13*I*d*x + 7*I*c)*log(-I*e^(I*d*x) + e
^(-I*c)) + 44226*a^4*e^(11*I*d*x + 5*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 11
0565*a^4*e^(9*I*d*x + 3*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 147420*a^4*e^(7
*I*d*x + I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 110565*a^4*e^(5*I*d*x - I*c)*l
og(-I*e^(I*d*x) + e^(-I*c)) + 44226*a^4*e^(3*I*d*x - 3*I*c)*log(-I*e^(I*d*x
```

```
) + e^(-I*c)) + 7371*a^4*e^(I*d*x - 5*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 1
792*I*a^4*e^(22*I*d*x + 16*I*c) - 22272*I*a^4*e^(20*I*d*x + 14*I*c) - 12825
6*I*a^4*e^(18*I*d*x + 12*I*c) - 455936*I*a^4*e^(16*I*d*x + 10*I*c) - 114432
0*I*a^4*e^(14*I*d*x + 8*I*c) - 2102784*I*a^4*e^(12*I*d*x + 6*I*c) - 2742784
*I*a^4*e^(10*I*d*x + 4*I*c) - 2382336*I*a^4*e^(8*I*d*x + 2*I*c) - 295680*I*
a^4*e^(4*I*d*x - 2*I*c) + 16128*I*a^4*e^(2*I*d*x - 4*I*c) - 1241856*I*a^4*e
^(6*I*d*x) + 16128*I*a^4*e^(-6*I*c))/(d*e^(13*I*d*x + 7*I*c) + 6*d*e^(11*I*
d*x + 5*I*c) + 15*d*e^(9*I*d*x + 3*I*c) + 20*d*e^(7*I*d*x + I*c) + 15*d*e^(
5*I*d*x - I*c) + 6*d*e^(3*I*d*x - 3*I*c) + d*e^(I*d*x - 5*I*c))
```

maple [B] time = 0.62, size = 233, normalized size = 1.94

$$\frac{a^4\left(-\frac{\left(\sin^3(dx+c)\right)\left(\cos^6(dx+c)\right)}{9}-\frac{\sin(dx+c)\left(\cos^6(dx+c)\right)}{21}+\frac{\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{105}\right)-4ia^4\left(-\frac{\left(\sin^2(dx+c)\right)\left(\cos^7(dx+c)\right)}{9}-\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 1/d*(a^4*(-1/9*sin(d*x+c)^3*cos(d*x+c)^6-1/21*sin(d*x+c)*cos(d*x+c)^6+1/105
*(8/3+cos(d*x+c)^4+4/3*cos(d*x+c)^2)*sin(d*x+c))-4*I*a^4*(-1/9*sin(d*x+c)^2
*cos(d*x+c)^7-2/63*cos(d*x+c)^7)-6*a^4*(-1/9*sin(d*x+c)*cos(d*x+c)^8+1/63*(
16/5+cos(d*x+c)^6+6/5*cos(d*x+c)^4+8/5*cos(d*x+c)^2)*sin(d*x+c))-4/9*I*a^4*
cos(d*x+c)^9+1/9*a^4*(128/35+cos(d*x+c)^8+8/7*cos(d*x+c)^6+48/35*cos(d*x+c)
^4+64/35*cos(d*x+c)^2)*sin(d*x+c))
```

maxima [A] time = 0.49, size = 181, normalized size = 1.51

$$-\frac{140i\,a^4\cos(dx+c)^9+20i\left(7\cos(dx+c)^9-9\cos(dx+c)^7\right)a^4-\left(35\sin(dx+c)^9-90\sin(dx+c)^7+63\sin\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] -1/315*(140*I*a^4*cos(d*x + c)^9 + 20*I*(7*cos(d*x + c)^9 - 9*cos(d*x + c)^
7)*a^4 - (35*sin(d*x + c)^9 - 90*sin(d*x + c)^7 + 63*sin(d*x + c)^5)*a^4 -
6*(35*sin(d*x + c)^9 - 135*sin(d*x + c)^7 + 189*sin(d*x + c)^5 - 105*sin(d*
x + c)^3)*a^4 - (35*sin(d*x + c)^9 - 180*sin(d*x + c)^7 + 378*sin(d*x + c)^
5 - 420*sin(d*x + c)^3 + 315*sin(d*x + c))*a^4)/d
```

mupad [B] time = 4.69, size = 145, normalized size = 1.21

$$\frac{2\,a^4\,\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)\left(\frac{89\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{8}-\frac{55\,\sin\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)}{4}+\frac{55\,\sin\left(\frac{5\,c}{2}+\frac{5\,d\,x}{2}\right)}{4}-\frac{355\,\sin\left(\frac{7\,c}{2}+\frac{7\,d\,x}{2}\right)}{16}+\frac{35\,\sin\left(\frac{9\,c}{2}+\frac{9\,d\,x}{2}\right)}{16}-\frac{\cos\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)21\mathrm{i}}{2}\right.}{63\,d\,\left(\cos\left(4\,c+4\,d\,x\right)-\sin\left(4\,c+4\,d\,x\right)\,1\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^9*(a + a*tan(c + d*x)*1i)^4,x)
```

```
[Out] (2*a^4*cos(c/2 + (d*x)/2)*((cos((5*c)/2 + (5*d*x)/2)*21i)/2 - (cos((3*c)/2
+ (3*d*x)/2)*21i)/2 - (cos((7*c)/2 + (7*d*x)/2)*87i)/4 + (cos((9*c)/2 + (9*
d*x)/2)*7i)/4 + (89*sin(c/2 + (d*x)/2))/8 - (55*sin((3*c)/2 + (3*d*x)/2))/4
 + (55*sin((5*c)/2 + (5*d*x)/2))/4 - (355*sin((7*c)/2 + (7*d*x)/2))/16 + (3
5*sin((9*c)/2 + (9*d*x)/2))/16))/(63*d*(cos(4*c + 4*d*x) - sin(4*c + 4*d*x)
*1i))
```

sympy [A] time = 0.75, size = 230, normalized size = 1.92

$$\begin{cases} \frac{\left(-176160768ia^4d^5e^{10ic}e^{9idx}-1132462080ia^4d^5e^{8ic}e^{7idx}-3170893824ia^4d^5e^{6ic}e^{5idx}-5284823040ia^4d^5e^{4ic}e^{3idx}-7927234560ia^4d^5e^{2ic}e^{idx}+1585446\right.}{50734301184d^6} \\ \frac{x\left(a^4e^{10ic}+5a^4e^{8ic}+10a^4e^{6ic}+10a^4e^{4ic}+5a^4e^{2ic}+a^4\right)e^{-ic}}{32} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**9*(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Piecewise(((-176160768*I*a**4*d**5*exp(10*I*c)*exp(9*I*d*x) - 1132462080*I*
a**4*d**5*exp(8*I*c)*exp(7*I*d*x) - 3170893824*I*a**4*d**5*exp(6*I*c)*exp(5
*I*d*x) - 5284823040*I*a**4*d**5*exp(4*I*c)*exp(3*I*d*x) - 7927234560*I*a**
4*d**5*exp(2*I*c)*exp(I*d*x) + 1585446912*I*a**4*d**5*exp(-I*d*x))*exp(-I*c
)/(50734301184*d**6), Ne(50734301184*d**6*exp(I*c), 0)), (x*(a**4*exp(10*I*
c) + 5*a**4*exp(8*I*c) + 10*a**4*exp(6*I*c) + 10*a**4*exp(4*I*c) + 5*a**4*e
xp(2*I*c) + a**4)*exp(-I*c)/32, True))
```

3.59 $\int \sec^8(c+dx)(a+ia\tan(c+dx))^5\,dx$

Optimal. Leaf size=109

$$\frac{i(a+ia\tan(c+dx))^{12}}{12a^7d}-\frac{6i(a+ia\tan(c+dx))^{11}}{11a^6d}+\frac{6i(a+ia\tan(c+dx))^{10}}{5a^5d}-\frac{8i(a+ia\tan(c+dx))^9}{9a^4d}$$

```
[Out] -8/9*I*(a+I*a*tan(d*x+c))^9/a^4/d+6/5*I*(a+I*a*tan(d*x+c))^10/a^5/d-6/11*I*
(a+I*a*tan(d*x+c))^11/a^6/d+1/12*I*(a+I*a*tan(d*x+c))^12/a^7/d
```

Rubi [A] time = 0.07, antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {3487, 43}

$$\frac{i(a+ia\tan(c+dx))^{12}}{12a^7d}-\frac{6i(a+ia\tan(c+dx))^{11}}{11a^6d}+\frac{6i(a+ia\tan(c+dx))^{10}}{5a^5d}-\frac{8i(a+ia\tan(c+dx))^9}{9a^4d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^8*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (((-8*I)/9)*(a + I*a*Tan[c + d*x])^9)/(a^4*d) + (((6*I)/5)*(a + I*a*Tan[c +
 d*x])^10)/(a^5*d) - (((6*I)/11)*(a + I*a*Tan[c + d*x])^11)/(a^6*d) + ((I/1
2)*(a + I*a*Tan[c + d*x])^12)/(a^7*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^8(c+dx)(a+ia\tan(c+dx))^5\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^3(a+x)^8\,dx, x, ia\tan(c+dx)\right)}{a^7d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(8a^3(a+x)^8-12a^2(a+x)^9+6a(a+x)^{10}-(a+x)^{11}\right)dx, x\right.}{a^7d}\\ &= -\frac{8i(a+ia\tan(c+dx))^9}{9a^4d}+\frac{6i(a+ia\tan(c+dx))^{10}}{5a^5d}-\frac{6i(a+ia\tan(c+\end{aligned}$$

$$11a^6d$$

Mathematica [A] time = 3.88, size = 167, normalized size = 1.53

$$\frac{a^5\sec(c)\sec^{12}(c+dx)(792\sin(c+2dx)-792\sin(3c+2dx)+495\sin(3c+4dx)-495\sin(5c+4dx)+440\sin(}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^8*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (a^5*Sec[c]*Sec[c + d*x]^12*((924*I)*Cos[c] + (792*I)*Cos[c + 2*d*x] + (792
*I)*Cos[3*c + 2*d*x] + (495*I)*Cos[3*c + 4*d*x] + (495*I)*Cos[5*c + 4*d*x]
- 924*Sin[c] + 792*Sin[c + 2*d*x] - 792*Sin[3*c + 2*d*x] + 495*Sin[3*c + 4*
d*x] - 495*Sin[5*c + 4*d*x] + 440*Sin[5*c + 6*d*x] + 132*Sin[7*c + 8*d*x] +
 24*Sin[9*c + 10*d*x] + 2*Sin[11*c + 12*d*x]))/(3960*d)
```

fricas [B] time = 0.88, size = 267, normalized size = 2.45

$$\frac{506880i\,a^5e^{(16i\,dx+16i\,c)} + 811008i\,a^5e^{(14i\,dx+14i\,c)} + 946176i\,a^5e^{(12i\,dx+12i\,c)} + 811008i\,a^5e^{(10i\,dx+10i\,c)}}{495\left(de^{(24i\,dx+24i\,c)} + 12\,de^{(22i\,dx+22i\,c)} + 66\,de^{(20i\,dx+20i\,c)} + 220\,de^{(18i\,dx+18i\,c)} + 495\,de^{(16i\,dx+16i\,c)} + 792\,de^{(14i\,dx+1}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/495*(506880*I*a^5*e^(16*I*d*x + 16*I*c) + 811008*I*a^5*e^(14*I*d*x + 14*I
*c) + 946176*I*a^5*e^(12*I*d*x + 12*I*c) + 811008*I*a^5*e^(10*I*d*x + 10*I*
c) + 506880*I*a^5*e^(8*I*d*x + 8*I*c) + 225280*I*a^5*e^(6*I*d*x + 6*I*c) +
67584*I*a^5*e^(4*I*d*x + 4*I*c) + 12288*I*a^5*e^(2*I*d*x + 2*I*c) + 1024*I*
a^5)/(d*e^(24*I*d*x + 24*I*c) + 12*d*e^(22*I*d*x + 22*I*c) + 66*d*e^(20*I*d
*x + 20*I*c) + 220*d*e^(18*I*d*x + 18*I*c) + 495*d*e^(16*I*d*x + 16*I*c) +
792*d*e^(14*I*d*x + 14*I*c) + 924*d*e^(12*I*d*x + 12*I*c) + 792*d*e^(10*I*d
*x + 10*I*c) + 495*d*e^(8*I*d*x + 8*I*c) + 220*d*e^(6*I*d*x + 6*I*c) + 66*d
*e^(4*I*d*x + 4*I*c) + 12*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [A] time = 2.58, size = 160, normalized size = 1.47

$$-\frac{-165i\,a^5\tan\left(dx+c\right)^{12} - 900\,a^5\tan\left(dx+c\right)^{11} + 1386i\,a^5\tan\left(dx+c\right)^{10} - 1100\,a^5\tan\left(dx+c\right)^9 + 5445i\,a^5\tan}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^5,x, algorithm="giac")
```

```
[Out] -1/1980*(-165*I*a^5*tan(d*x + c)^12 - 900*a^5*tan(d*x + c)^11 + 1386*I*a^5*
tan(d*x + c)^10 - 1100*a^5*tan(d*x + c)^9 + 5445*I*a^5*tan(d*x + c)^8 + 396
0*a^5*tan(d*x + c)^7 + 4620*I*a^5*tan(d*x + c)^6 + 8712*a^5*tan(d*x + c)^5
- 2475*I*a^5*tan(d*x + c)^4 + 4620*a^5*tan(d*x + c)^3 - 4950*I*a^5*tan(d*x
+ c)^2 - 1980*a^5*tan(d*x + c))/d
```

maple [B] time = 0.50, size = 377, normalized size = 3.46

$$\frac{ia^5\left(\frac{\sin^6(dx+c)}{12\cos(dx+c)^{12}} + \frac{\sin^6(dx+c)}{20\cos(dx+c)^{10}} + \frac{\sin^6(dx+c)}{40\cos(dx+c)^8} + \frac{\sin^6(dx+c)}{120\cos(dx+c)^6}\right) + 5a^5\left(\frac{\sin^5(dx+c)}{11\cos(dx+c)^{11}} + \frac{2\left(\sin^5(dx+c)\right)}{33\cos(dx+c)^9} + \frac{8\left(\sin^5(dx+c)\right)}{231\cos(dx+c)^7}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^5,x)
```

```
[Out] 1/d*(I*a^5*(1/12*sin(d*x+c)^6/cos(d*x+c)^12+1/20*sin(d*x+c)^6/cos(d*x+c)^10
+1/40*sin(d*x+c)^6/cos(d*x+c)^8+1/120*sin(d*x+c)^6/cos(d*x+c)^6)+5*a^5*(1/1
1*sin(d*x+c)^5/cos(d*x+c)^11+2/33*sin(d*x+c)^5/cos(d*x+c)^9+8/231*sin(d*x+c
)^5/cos(d*x+c)^7+16/1155*sin(d*x+c)^5/cos(d*x+c)^5)-10*I*a^5*(1/10*sin(d*x+
c)^4/cos(d*x+c)^10+3/40*sin(d*x+c)^4/cos(d*x+c)^8+1/20*sin(d*x+c)^4/cos(d*x
+c)^6+1/40*sin(d*x+c)^4/cos(d*x+c)^4)-10*a^5*(1/9*sin(d*x+c)^3/cos(d*x+c)^9
+2/21*sin(d*x+c)^3/cos(d*x+c)^7+8/105*sin(d*x+c)^3/cos(d*x+c)^5+16/315*sin(
d*x+c)^3/cos(d*x+c)^3)+5/8*I*a^5/cos(d*x+c)^8-a^5*(-16/35-1/7*sec(d*x+c)^6-
6/35*sec(d*x+c)^4-8/35*sec(d*x+c)^2)*tan(d*x+c))
```

maxima [A] time = 0.46, size = 160, normalized size = 1.47

$$\frac{2310i\,a^5\tan\left(dx+c\right)^{12} + 12600\,a^5\tan\left(dx+c\right)^{11} - 19404i\,a^5\tan\left(dx+c\right)^{10} + 15400\,a^5\tan\left(dx+c\right)^9 - 76230i\,a}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] 1/27720*(2310*I*a^5*tan(d*x + c)^12 + 12600*a^5*tan(d*x + c)^11 - 19404*I*a
^5*tan(d*x + c)^10 + 15400*a^5*tan(d*x + c)^9 - 76230*I*a^5*tan(d*x + c)^8
- 55440*a^5*tan(d*x + c)^7 - 64680*I*a^5*tan(d*x + c)^6 - 121968*a^5*tan(d*
x + c)^5 + 34650*I*a^5*tan(d*x + c)^4 - 64680*a^5*tan(d*x + c)^3 + 69300*I*
a^5*tan(d*x + c)^2 + 27720*a^5*tan(d*x + c))/d
```

mupad [B] time = 3.71, size = 146, normalized size = 1.34

$$a^5 \left(-\cos\left(c+d\,x\right)^{12}\,1749\mathrm{i}+2048\,\sin\left(c+d\,x\right)\,\cos\left(c+d\,x\right)^{11}+1024\,\sin\left(c+d\,x\right)\,\cos\left(c+d\,x\right)^{9}+768\,\sin\left(c+d\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^5/cos(c + d*x)^8,x)
```

```
[Out] (a^5*(900*cos(c + d*x)*sin(c + d*x) - 3400*cos(c + d*x)^3*sin(c + d*x) + 64
0*cos(c + d*x)^5*sin(c + d*x) + 768*cos(c + d*x)^7*sin(c + d*x) + 1024*cos(
c + d*x)^9*sin(c + d*x) + 2048*cos(c + d*x)^11*sin(c + d*x) - cos(c + d*x)^
2*2376i + cos(c + d*x)^4*3960i - cos(c + d*x)^12*1749i + 165i))/(1980*d*cos
(c + d*x)^12)
```

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

$$ia^5 \left(\int \left(-i\sec^8\left(c+dx\right)\right)dx+\int 5\tan\left(c+dx\right)\sec^8\left(c+dx\right)dx+\int\left(-10\tan^3\left(c+dx\right)\sec^8\left(c+dx\right)\right)dx+\int \tan\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8*(a+I*a*tan(d*x+c))**5,x)
```

```
[Out] I*a**5*(Integral(-I*sec(c + d*x)**8, x) + Integral(5*tan(c + d*x)*sec(c + d
*x)**8, x) + Integral(-10*tan(c + d*x)**3*sec(c + d*x)**8, x) + Integral(ta
n(c + d*x)**5*sec(c + d*x)**8, x) + Integral(10*I*tan(c + d*x)**2*sec(c + d
*x)**8, x) + Integral(-5*I*tan(c + d*x)**4*sec(c + d*x)**8, x))
```

3.60 $\int \sec^6(c+dx)(a+ia\tan(c+dx))^5\,dx$

Optimal. Leaf size=82

$$-\frac{i(a+ia\tan(c+dx))^{10}}{10a^5d}+\frac{4i(a+ia\tan(c+dx))^9}{9a^4d}-\frac{i(a+ia\tan(c+dx))^8}{2a^3d}$$

```
[Out] -1/2*I*(a+I*a*tan(d*x+c))^8/a^3/d+4/9*I*(a+I*a*tan(d*x+c))^9/a^4/d-1/10*I*(
a+I*a*tan(d*x+c))^10/a^5/d
```

Rubi [A] time = 0.06, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$-\frac{i(a+ia\tan(c+dx))^{10}}{10a^5d}+\frac{4i(a+ia\tan(c+dx))^9}{9a^4d}-\frac{i(a+ia\tan(c+dx))^8}{2a^3d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] ((-I/2)*(a + I*a*Tan[c + d*x])^8)/(a^3*d) + (((4*I)/9)*(a + I*a*Tan[c + d*x
])^9)/(a^4*d) - ((I/10)*(a + I*a*Tan[c + d*x])^10)/(a^5*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^6(c+dx)(a+ia\tan(c+dx))^5\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^2(a+x)^7\,dx,x,ia\tan(c+dx)\right)}{a^5d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(4a^2(a+x)^7-4a(a+x)^8+(a+x)^9\right)dx,x,ia\tan(c+d\right.}{a^5d}\\ &= -\frac{i(a+ia\tan(c+dx))^8}{2a^3d}+\frac{4i(a+ia\tan(c+dx))^9}{9a^4d}-\frac{i(a+ia\tan(c+\right.}{10a^5d}\end{aligned}$$

Mathematica [A] time = 2.84, size = 154, normalized size = 1.88

$$\frac{a^5\sec(c)\sec^{10}(c+dx)(105\sin(c+2dx)-105\sin(3c+2dx)+60\sin(3c+4dx)-60\sin(5c+4dx)+45\sin(5\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (a^5*Sec[c]*Sec[c + d*x]^10*((126*I)*Cos[c] + (105*I)*Cos[c + 2*d*x] + (105
*I)*Cos[3*c + 2*d*x] + (60*I)*Cos[3*c + 4*d*x] + (60*I)*Cos[5*c + 4*d*x] -
```

```
126*Sin[c] + 105*Sin[c + 2*d*x] - 105*Sin[3*c + 2*d*x] + 60*Sin[3*c + 4*d*x
] - 60*Sin[5*c + 4*d*x] + 45*Sin[5*c + 6*d*x] + 10*Sin[7*c + 8*d*x] + Sin[9
*c + 10*d*x]))/(360*d)
```

fricas [B] time = 0.55, size = 229, normalized size = 2.79

$$\frac{15360i\,a^5 e^{(14i\,dx+14i\,c)} + 26880i\,a^5 e^{(12i\,dx+12i\,c)} + 32256i\,a^5 e^{(10i\,dx+10i\,c)} + 26880i\,a^5 e^{(8i\,dx+8i\,c)} + 15360i\,a^5}{45\left(de^{(20i\,dx+20i\,c)} + 10\,de^{(18i\,dx+18i\,c)} + 45\,de^{(16i\,dx+16i\,c)} + 120\,de^{(14i\,dx+14i\,c)} + 210\,de^{(12i\,dx+12i\,c)} + 252\,de^{(10i\,dx+10i\,c)} +\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/45*(15360*I*a^5*e^(14*I*d*x + 14*I*c) + 26880*I*a^5*e^(12*I*d*x + 12*I*c)
 + 32256*I*a^5*e^(10*I*d*x + 10*I*c) + 26880*I*a^5*e^(8*I*d*x + 8*I*c) + 15
360*I*a^5*e^(6*I*d*x + 6*I*c) + 5760*I*a^5*e^(4*I*d*x + 4*I*c) + 1280*I*a^5
*e^(2*I*d*x + 2*I*c) + 128*I*a^5)/(d*e^(20*I*d*x + 20*I*c) + 10*d*e^(18*I*d
*x + 18*I*c) + 45*d*e^(16*I*d*x + 16*I*c) + 120*d*e^(14*I*d*x + 14*I*c) + 2
10*d*e^(12*I*d*x + 12*I*c) + 252*d*e^(10*I*d*x + 10*I*c) + 210*d*e^(8*I*d*x
 + 8*I*c) + 120*d*e^(6*I*d*x + 6*I*c) + 45*d*e^(4*I*d*x + 4*I*c) + 10*d*e^(
2*I*d*x + 2*I*c) + d)
```

giac [A] time = 2.23, size = 108, normalized size = 1.32

$$-\frac{-9i\,a^5 \tan\left(dx+c\right)^{10} - 50\,a^5 \tan\left(dx+c\right)^9 + 90i\,a^5 \tan\left(dx+c\right)^8 + 210i\,a^5 \tan\left(dx+c\right)^6 + 252\,a^5 \tan\left(dx+c\right)^5 +}{90\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^5,x, algorithm="giac")
```

```
[Out] -1/90*(-9*I*a^5*tan(d*x + c)^10 - 50*a^5*tan(d*x + c)^9 + 90*I*a^5*tan(d*x
+ c)^8 + 210*I*a^5*tan(d*x + c)^6 + 252*a^5*tan(d*x + c)^5 + 240*a^5*tan(d*
x + c)^3 - 225*I*a^5*tan(d*x + c)^2 - 90*a^5*tan(d*x + c))/d
```

maple [B] time = 0.52, size = 295, normalized size = 3.60

$$ia^5\left(\frac{\sin^6(dx+c)}{10\cos(dx+c)^{10}} + \frac{\sin^6(dx+c)}{20\cos(dx+c)^8} + \frac{\sin^6(dx+c)}{60\cos(dx+c)^6}\right) + 5a^5\left(\frac{\sin^5(dx+c)}{9\cos(dx+c)^9} + \frac{4\left(\sin^5(dx+c)\right)}{63\cos(dx+c)^7} + \frac{8\left(\sin^5(dx+c)\right)}{315\cos(dx+c)^5}\right) - 10ia^5\left(\frac{\sin^4(dx+c)}{8\cos(dx+c)^8}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^5,x)
```

```
[Out] 1/d*(I*a^5*(1/10*sin(d*x+c)^6/cos(d*x+c)^10+1/20*sin(d*x+c)^6/cos(d*x+c)^8+
1/60*sin(d*x+c)^6/cos(d*x+c)^6)+5*a^5*(1/9*sin(d*x+c)^5/cos(d*x+c)^9+4/63*s
in(d*x+c)^5/cos(d*x+c)^7+8/315*sin(d*x+c)^5/cos(d*x+c)^5)-10*I*a^5*(1/8*sin
(d*x+c)^4/cos(d*x+c)^8+1/12*sin(d*x+c)^4/cos(d*x+c)^6+1/24*sin(d*x+c)^4/cos
(d*x+c)^4)-10*a^5*(1/7*sin(d*x+c)^3/cos(d*x+c)^7+4/35*sin(d*x+c)^3/cos(d*x+
c)^5+8/105*sin(d*x+c)^3/cos(d*x+c)^3)+5/6*I*a^5/cos(d*x+c)^6-a^5*(-8/15-1/5
*sec(d*x+c)^4-4/15*sec(d*x+c)^2)*tan(d*x+c))
```

maxima [A] time = 0.50, size = 108, normalized size = 1.32

$$\frac{126i\,a^5 \tan\left(dx+c\right)^{10} + 700\,a^5 \tan\left(dx+c\right)^9 - 1260i\,a^5 \tan\left(dx+c\right)^8 - 2940i\,a^5 \tan\left(dx+c\right)^6 - 3528\,a^5 \tan\left(dx+\right.}{1260\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] 1/1260*(126*I*a^5*tan(d*x + c)^10 + 700*a^5*tan(d*x + c)^9 - 1260*I*a^5*tan
(d*x + c)^8 - 2940*I*a^5*tan(d*x + c)^6 - 3528*a^5*tan(d*x + c)^5 - 3360*a^
5*tan(d*x + c)^3 + 3150*I*a^5*tan(d*x + c)^2 + 1260*a^5*tan(d*x + c))/d
```

mupad [B] time = 3.33, size = 151, normalized size = 1.84

$$a^5 \sin(c+dx) \left(90\cos(c+dx)^9 + \cos(c+dx)^8 \sin(c+dx)\, 225i - 240\cos(c+dx)^7 \sin(c+dx)^2 - 252\,\mathrm{cc}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^5/cos(c + d*x)^6,x)
```

```
[Out] (a^5*sin(c + d*x)*(50*cos(c + d*x)*sin(c + d*x)^8 + cos(c + d*x)^8*sin(c +
d*x)*225i + 90*cos(c + d*x)^9 + sin(c + d*x)^9*9i - cos(c + d*x)^2*sin(c +
d*x)^7*90i - cos(c + d*x)^4*sin(c + d*x)^5*210i - 252*cos(c + d*x)^5*sin(c
+ d*x)^4 - 240*cos(c + d*x)^7*sin(c + d*x)^2))/(90*d*cos(c + d*x)^10)
```

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

$$ia^5 \left(\int \left(-i\sec^6(c+dx)\right) dx + \int 5\tan(c+dx)\sec^6(c+dx)\, dx + \int \left(-10\tan^3(c+dx)\sec^6(c+dx)\right) dx + \int\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6*(a+I*a*tan(d*x+c))**5,x)
```

```
[Out] I*a**5*(Integral(-I*sec(c + d*x)**6, x) + Integral(5*tan(c + d*x)*sec(c + d
*x)**6, x) + Integral(-10*tan(c + d*x)**3*sec(c + d*x)**6, x) + Integral(ta
n(c + d*x)**5*sec(c + d*x)**6, x) + Integral(10*I*tan(c + d*x)**2*sec(c + d
*x)**6, x) + Integral(-5*I*tan(c + d*x)**4*sec(c + d*x)**6, x))
```

3.61 $\int \sec^4(c+dx)(a+ia\tan(c+dx))^5\,dx$

Optimal. Leaf size=55

$$\frac{i(a+ia\tan(c+dx))^8}{8a^3d}-\frac{2i(a+ia\tan(c+dx))^7}{7a^2d}$$

```
[Out] -2/7*I*(a+I*a*tan(d*x+c))^7/a^2/d+1/8*I*(a+I*a*tan(d*x+c))^8/a^3/d
```

Rubi [A] time = 0.04, antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{i(a+ia\tan(c+dx))^8}{8a^3d}-\frac{2i(a+ia\tan(c+dx))^7}{7a^2d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (((-2*I)/7)*(a + I*a*Tan[c + d*x])^7)/(a^2*d) + ((I/8)*(a + I*a*Tan[c + d*x
])^8)/(a^3*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^4(c+dx)(a+ia\tan(c+dx))^5\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)(a+x)^6\,dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(2a(a+x)^6-(a+x)^7\right)dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{2i(a+ia\tan(c+dx))^7}{7a^2d}+\frac{i(a+ia\tan(c+dx))^8}{8a^3d}\end{aligned}$$

Mathematica [B] time = 2.09, size = 143, normalized size = 2.60

$$\frac{a^5\sec(c)\sec^8(c+dx)(28\sin(c+2dx)-28\sin(3c+2dx)+14\sin(3c+4dx)-14\sin(5c+4dx)+8\sin(5c+6dx)}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (a^5*Sec[c]*Sec[c + d*x]^8*((35*I)*Cos[c] + (28*I)*Cos[c + 2*d*x] + (28*I)*
Cos[3*c + 2*d*x] + (14*I)*Cos[3*c + 4*d*x] + (14*I)*Cos[5*c + 4*d*x] - 35*S
```

```
in[c] + 28*Sin[c + 2*d*x] - 28*Sin[3*c + 2*d*x] + 14*Sin[3*c + 4*d*x] - 14*
Sin[5*c + 4*d*x] + 8*Sin[5*c + 6*d*x] + Sin[7*c + 8*d*x]))/(56*d)
```

fricas [B] time = 0.47, size = 191, normalized size = 3.47

$$\frac{896i\,a^5e^{(12i\,dx+12i\,c)} + 1792i\,a^5e^{(10i\,dx+10i\,c)} + 2240i\,a^5e^{(8i\,dx+8i\,c)} + 1792i\,a^5e^{(6i\,dx+6i\,c)} + 896i\,a^5e^{(4i\,dx+4i\,c)} + 2}{7\left(de^{(16i\,dx+16i\,c)} + 8\,de^{(14i\,dx+14i\,c)} + 28\,de^{(12i\,dx+12i\,c)} + 56\,de^{(10i\,dx+10i\,c)} + 70\,de^{(8i\,dx+8i\,c)} + 56\,de^{(6i\,dx+6i\,c)} + 28\,de\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/7*(896*I*a^5*e^(12*I*d*x + 12*I*c) + 1792*I*a^5*e^(10*I*d*x + 10*I*c) + 2
240*I*a^5*e^(8*I*d*x + 8*I*c) + 1792*I*a^5*e^(6*I*d*x + 6*I*c) + 896*I*a^5*
e^(4*I*d*x + 4*I*c) + 256*I*a^5*e^(2*I*d*x + 2*I*c) + 32*I*a^5)/(d*e^(16*I*
d*x + 16*I*c) + 8*d*e^(14*I*d*x + 14*I*c) + 28*d*e^(12*I*d*x + 12*I*c) + 56
*d*e^(10*I*d*x + 10*I*c) + 70*d*e^(8*I*d*x + 8*I*c) + 56*d*e^(6*I*d*x + 6*I
*c) + 28*d*e^(4*I*d*x + 4*I*c) + 8*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [B] time = 2.45, size = 108, normalized size = 1.96

$$-\frac{-7i\,a^5\tan\left(dx+c\right)^8 - 40\,a^5\tan\left(dx+c\right)^7 + 84i\,a^5\tan\left(dx+c\right)^6 + 56\,a^5\tan\left(dx+c\right)^5 + 70i\,a^5\tan\left(dx+c\right)^4 +}{56\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^5,x, algorithm="giac")
```

```
[Out] -1/56*(-7*I*a^5*tan(d*x + c)^8 - 40*a^5*tan(d*x + c)^7 + 84*I*a^5*tan(d*x +
 c)^6 + 56*a^5*tan(d*x + c)^5 + 70*I*a^5*tan(d*x + c)^4 + 168*a^5*tan(d*x +
 c)^3 - 140*I*a^5*tan(d*x + c)^2 - 56*a^5*tan(d*x + c))/d
```

maple [B] time = 0.45, size = 213, normalized size = 3.87

$$\frac{ia^5\left(\frac{\sin^6(dx+c)}{8\cos(dx+c)^8} + \frac{\sin^6(dx+c)}{24\cos(dx+c)^6}\right) + 5a^5\left(\frac{\sin^5(dx+c)}{7\cos(dx+c)^7} + \frac{2\left(\sin^5(dx+c)\right)}{35\cos(dx+c)^5}\right) - 10ia^5\left(\frac{\sin^4(dx+c)}{6\cos(dx+c)^6} + \frac{\sin^4(dx+c)}{12\cos(dx+c)^4}\right) - 10a^5\left(\frac{\sin^3}{5\cos}\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^5,x)
```

```
[Out] 1/d*(I*a^5*(1/8*sin(d*x+c)^6/cos(d*x+c)^8+1/24*sin(d*x+c)^6/cos(d*x+c)^6)+5
*a^5*(1/7*sin(d*x+c)^5/cos(d*x+c)^7+2/35*sin(d*x+c)^5/cos(d*x+c)^5)-10*I*a^
5*(1/6*sin(d*x+c)^4/cos(d*x+c)^6+1/12*sin(d*x+c)^4/cos(d*x+c)^4)-10*a^5*(1/
5*sin(d*x+c)^3/cos(d*x+c)^5+2/15*sin(d*x+c)^3/cos(d*x+c)^3)+5/4*I*a^5/cos(d
*x+c)^4-a^5*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c))
```

maxima [B] time = 0.35, size = 108, normalized size = 1.96

$$\frac{21i\,a^5\tan\left(dx+c\right)^8 + 120\,a^5\tan\left(dx+c\right)^7 - 252i\,a^5\tan\left(dx+c\right)^6 - 168\,a^5\tan\left(dx+c\right)^5 - 210i\,a^5\tan\left(dx+c\right)^4}{168\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] 1/168*(21*I*a^5*tan(d*x + c)^8 + 120*a^5*tan(d*x + c)^7 - 252*I*a^5*tan(d*x
 + c)^6 - 168*a^5*tan(d*x + c)^5 - 210*I*a^5*tan(d*x + c)^4 - 504*a^5*tan(d
*x + c)^3 + 420*I*a^5*tan(d*x + c)^2 + 168*a^5*tan(d*x + c))/d
```

mupad [B] time = 3.30, size = 151, normalized size = 2.75

$$a^5 \sin(c+dx) \left(56\cos(c+dx)^7 + \cos(c+dx)^6 \sin(c+dx)\, 140\mathrm{i} - 168\cos(c+dx)^5 \sin(c+dx)^2 - \cos(c+d$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^5/cos(c + d*x)^4,x)
```

```
[Out] (a^5*sin(c + d*x)*(40*cos(c + d*x)*sin(c + d*x)^6 + cos(c + d*x)^6*sin(c +
d*x)*140i + 56*cos(c + d*x)^7 + sin(c + d*x)^7*7i - cos(c + d*x)^2*sin(c +
d*x)^5*84i - 56*cos(c + d*x)^3*sin(c + d*x)^4 - cos(c + d*x)^4*sin(c + d*x)
^3*70i - 168*cos(c + d*x)^5*sin(c + d*x)^2))/(56*d*cos(c + d*x)^8)
```

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

$$ia^5 \left(\int \left(-i\sec^4(c+dx)\right) dx + \int 5\tan(c+dx)\sec^4(c+dx)\, dx + \int \left(-10\tan^3(c+dx)\sec^4(c+dx)\right) dx + \int \tan$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4*(a+I*a*tan(d*x+c))**5,x)
```

```
[Out] I*a**5*(Integral(-I*sec(c + d*x)**4, x) + Integral(5*tan(c + d*x)*sec(c + d
*x)**4, x) + Integral(-10*tan(c + d*x)**3*sec(c + d*x)**4, x) + Integral(ta
n(c + d*x)**5*sec(c + d*x)**4, x) + Integral(10*I*tan(c + d*x)**2*sec(c + d
*x)**4, x) + Integral(-5*I*tan(c + d*x)**4*sec(c + d*x)**4, x))
```

3.62 $\int \sec^2(c+dx)(a+ia\tan(c+dx))^5\,dx$

Optimal. Leaf size=27

$$-\frac{i(a+ia\tan(c+dx))^6}{6ad}$$

```
[Out] -1/6*I*(a+I*a*tan(d*x+c))^6/a/d
```

Rubi [A] time = 0.04, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 32}

$$-\frac{i(a+ia\tan(c+dx))^6}{6ad}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] ((-I/6)*(a + I*a*Tan[c + d*x])^6)/(a*d)
```

Rule 32

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^2(c+dx)(a+ia\tan(c+dx))^5\,dx &= -\frac{i\,\text{Subst}\left(\int (a+x)^5\,dx, x, ia\tan(c+dx)\right)}{ad}\\ &= -\frac{i(a+ia\tan(c+dx))^6}{6ad}\end{aligned}$$

Mathematica [B] time = 1.91, size = 134, normalized size = 4.96

$$\frac{a^5\sec(c)\sec^6(c+dx)(15\sin(c+2dx)-15\sin(3c+2dx)+6\sin(3c+4dx)-6\sin(5c+4dx)+2\sin(5c+6dx}{12d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (a^5*Sec[c]*Sec[c + d*x]^6*((20*I)*Cos[c] + (15*I)*Cos[c + 2*d*x] + (15*I)*
Cos[3*c + 2*d*x] + (6*I)*Cos[3*c + 4*d*x] + (6*I)*Cos[5*c + 4*d*x] - 20*Sin
[c] + 15*Sin[c + 2*d*x] - 15*Sin[3*c + 2*d*x] + 6*Sin[3*c + 4*d*x] - 6*Sin[
5*c + 4*d*x] + 2*Sin[5*c + 6*d*x]))/(12*d)
```

fricas [B] time = 0.58, size = 153, normalized size = 5.67

$$\frac{192i\,a^5e^{(10i\,dx+10i\,c)}+480i\,a^5e^{(8i\,dx+8i\,c)}+640i\,a^5e^{(6i\,dx+6i\,c)}+480i\,a^5e^{(4i\,dx+4i\,c)}+192i\,a^5e^{(2i\,dx+2i\,c)}+32i\,a^5}{3\left(de^{(12i\,dx+12i\,c)}+6\,de^{(10i\,dx+10i\,c)}+15\,de^{(8i\,dx+8i\,c)}+20\,de^{(6i\,dx+6i\,c)}+15\,de^{(4i\,dx+4i\,c)}+6\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/3*(192*I*a^5*e^(10*I*d*x + 10*I*c) + 480*I*a^5*e^(8*I*d*x + 8*I*c) + 640*
I*a^5*e^(6*I*d*x + 6*I*c) + 480*I*a^5*e^(4*I*d*x + 4*I*c) + 192*I*a^5*e^(2*
I*d*x + 2*I*c) + 32*I*a^5)/(d*e^(12*I*d*x + 12*I*c) + 6*d*e^(10*I*d*x + 10*
I*c) + 15*d*e^(8*I*d*x + 8*I*c) + 20*d*e^(6*I*d*x + 6*I*c) + 15*d*e^(4*I*d*
x + 4*I*c) + 6*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [B] time = 1.92, size = 82, normalized size = 3.04

$$-\frac{-i\,a^5\tan(dx+c)^6 - 6\,a^5\tan(dx+c)^5 + 15i\,a^5\tan(dx+c)^4 + 20\,a^5\tan(dx+c)^3 - 15i\,a^5\tan(dx+c)^2 - 6\,a^5\,\mathrm{ta}}{6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^5,x, algorithm="giac")
```

```
[Out] -1/6*(-I*a^5*tan(d*x + c)^6 - 6*a^5*tan(d*x + c)^5 + 15*I*a^5*tan(d*x + c)^
4 + 20*a^5*tan(d*x + c)^3 - 15*I*a^5*tan(d*x + c)^2 - 6*a^5*tan(d*x + c))/d
```

maple [B] time = 0.44, size = 115, normalized size = 4.26

$$\frac{\frac{ia^5\left(\sin^6(dx+c)\right)}{6\cos(dx+c)^6} + \frac{a^5\left(\sin^5(dx+c)\right)}{\cos(dx+c)^5} - \frac{5ia^5\left(\sin^4(dx+c)\right)}{2\cos(dx+c)^4} - \frac{10a^5\left(\sin^3(dx+c)\right)}{3\cos(dx+c)^3} + \frac{5ia^5}{2\cos(dx+c)^2} + a^5\tan(dx+c)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^5,x)
```

```
[Out] 1/d*(1/6*I*a^5*sin(d*x+c)^6/cos(d*x+c)^6+a^5*sin(d*x+c)^5/cos(d*x+c)^5-5/2*
I*a^5*sin(d*x+c)^4/cos(d*x+c)^4-10/3*a^5*sin(d*x+c)^3/cos(d*x+c)^3+5/2*I*a^
5/cos(d*x+c)^2+a^5*tan(d*x+c))
```

maxima [A] time = 0.41, size = 21, normalized size = 0.78

$$-\frac{i\,(i\,a\tan(dx+c)+a)^6}{6\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] -1/6*I*(I*a*tan(d*x + c) + a)^6/(a*d)
```

mupad [B] time = 3.26, size = 114, normalized size = 4.22

$$\frac{a^5\,\sin(c+d\,x)\,\left(6\cos(c+d\,x)^5 + \cos(c+d\,x)^4\,\sin(c+d\,x)\,15\mathrm{i} - 20\cos(c+d\,x)^3\sin(c+d\,x)^2 - \cos(c+d\,x)^2}{6\,d\cos(c+d\,x)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^5/cos(c + d*x)^2,x)
```

```
[Out] (a^5*sin(c + d*x)*(6*cos(c + d*x)*sin(c + d*x)^4 + cos(c + d*x)^4*sin(c + d
*x)*15i + 6*cos(c + d*x)^5 + sin(c + d*x)^5*1i - cos(c + d*x)^2*sin(c + d*x
)^3*15i - 20*cos(c + d*x)^3*sin(c + d*x)^2))/(6*d*cos(c + d*x)^6)
```

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

$$ia^5\left(\int\left(-i\sec^2(c+dx)\right)dx + \int 5\tan(c+dx)\sec^2(c+dx)\,dx + \int\left(-10\tan^3(c+dx)\sec^2(c+dx)\right)dx + \int \mathrm{tan}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2*(a+I*a*tan(d*x+c))**5,x)
```

```
[Out] I*a**5*(Integral(-I*sec(c + d*x)**2, x) + Integral(5*tan(c + d*x)*sec(c + d
*x)**2, x) + Integral(-10*tan(c + d*x)**3*sec(c + d*x)**2, x) + Integral(ta
n(c + d*x)**5*sec(c + d*x)**2, x) + Integral(10*I*tan(c + d*x)**2*sec(c + d
*x)**2, x) + Integral(-5*I*tan(c + d*x)**4*sec(c + d*x)**2, x))
```

3.63 $\int (a + ia\tan(c + dx))^5 \, dx$

Optimal. Leaf size=117

$$-\frac{8a^5\tan(c+dx)}{d}-\frac{16ia^5\log(\cos(c+dx))}{d}+16a^5x+\frac{2ia^2(a+ia\tan(c+dx))^3}{3d}+\frac{2ia\left(a^2+ia^2\tan(c+dx)\right)^2}{d}+\frac{ia(a+$$

```
[Out] 16*a^5*x-16*I*a^5*ln(cos(d*x+c))/d-8*a^5*tan(d*x+c)/d+2/3*I*a^2*(a+I*a*tan(
d*x+c))^3/d+1/4*I*a*(a+I*a*tan(d*x+c))^4/d+2*I*a*(a^2+I*a^2*tan(d*x+c))^2/d
```

Rubi [A] time = 0.07, antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {3478, 3477, 3475}

$$-\frac{8a^5\tan(c+dx)}{d}+\frac{2ia^2(a+ia\tan(c+dx))^3}{3d}+\frac{2ia\left(a^2+ia^2\tan(c+dx)\right)^2}{d}-\frac{16ia^5\log(\cos(c+dx))}{d}+16a^5x+\frac{ia(a+$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] 16*a^5*x - ((16*I)*a^5*Log[Cos[c + d*x]])/d - (8*a^5*Tan[c + d*x])/d + (((2
*I)/3)*a^2*(a + I*a*Tan[c + d*x])^3)/d + ((I/4)*a*(a + I*a*Tan[c + d*x])^4)
/d + ((2*I)*a*(a^2 + I*a^2*Tan[c + d*x])^2)/d
```

Rule 3475

```
Int[tan[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[Log[RemoveContent[Cos[c + d
*x], x]]/d, x] /; FreeQ[{c, d}, x]
```

Rule 3477

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

Rule 3478

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

Rubi steps

$$\begin{aligned}
\int (a+ia\tan(c+dx))^5\,dx &= \frac{ia(a+ia\tan(c+dx))^4}{4d}+(2a)\int (a+ia\tan(c+dx))^4\,dx\\
&= \frac{2ia^2(a+ia\tan(c+dx))^3}{3d}+\frac{ia(a+ia\tan(c+dx))^4}{4d}+\left(4a^2\right)\int (a+ia\tan(c+dx))^3\,d\\
&= \frac{2ia^3(a+ia\tan(c+dx))^2}{d}+\frac{2ia^2(a+ia\tan(c+dx))^3}{3d}+\frac{ia(a+ia\tan(c+dx))^4}{4d}+\left(8a\right.\\
&= 16a^5x-\frac{8a^5\tan(c+dx)}{d}+\frac{2ia^3(a+ia\tan(c+dx))^2}{d}+\frac{2ia^2(a+ia\tan(c+dx))^3}{3d}+\\
&= 16a^5x-\frac{16ia^5\log(\cos(c+dx))}{d}-\frac{8a^5\tan(c+dx)}{d}+\frac{2ia^3(a+ia\tan(c+dx))^2}{d}+
\end{aligned}$$

Mathematica [A] time = 2.87, size = 228, normalized size = 1.95

$$\frac{a^5 \sec(c)\sec^4(c+dx)\left(-70\sin(c+2dx)+30\sin(3c+2dx)-25\sin(3c+4dx)+48dx\cos(3c+2dx)-18i\cos\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (a^5*Sec[c]*Sec[c + d*x]^4*((-18*I)*Cos[3*c + 2*d*x] + 48*d*x*Cos[3*c + 2*d
*x] + 12*d*x*Cos[3*c + 4*d*x] + 12*d*x*Cos[5*c + 4*d*x] + 6*Cos[c + 2*d*x]*
(-3*I + 8*d*x - (4*I)*Log[Cos[c + d*x]^2]) + Cos[c]*(-33*I + 72*d*x - (36*I
)*Log[Cos[c + d*x]^2]) - (24*I)*Cos[3*c + 2*d*x]*Log[Cos[c + d*x]^2] - (6*I
)*Cos[3*c + 4*d*x]*Log[Cos[c + d*x]^2] - (6*I)*Cos[5*c + 4*d*x]*Log[Cos[c +
 d*x]^2] + 75*Sin[c] - 70*Sin[c + 2*d*x] + 30*Sin[3*c + 2*d*x] - 25*Sin[3*c
 + 4*d*x]))/(12*d)
```

fricas [A] time = 0.62, size = 176, normalized size = 1.50

$$\frac{-192i\,a^5e^{(6i\,dx+6i\,c)}-432i\,a^5e^{(4i\,dx+4i\,c)}-352i\,a^5e^{(2i\,dx+2i\,c)}-100i\,a^5+\left(-48i\,a^5e^{(8i\,dx+8i\,c)}-192i\,a^5e^{(6i\,dx+6i\,c)}-2\right.}{3\left(de^{(8i\,dx+8i\,c)}+4\,de^{(6i\,dx+6i\,c)}+6\,de^{(4i\,dx+4i\,c)}+4\,de^{(2i\,dx+\right.}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/3*(-192*I*a^5*e^(6*I*d*x + 6*I*c) - 432*I*a^5*e^(4*I*d*x + 4*I*c) - 352*I
*a^5*e^(2*I*d*x + 2*I*c) - 100*I*a^5 + (-48*I*a^5*e^(8*I*d*x + 8*I*c) - 192
*I*a^5*e^(6*I*d*x + 6*I*c) - 288*I*a^5*e^(4*I*d*x + 4*I*c) - 192*I*a^5*e^(2
*I*d*x + 2*I*c) - 48*I*a^5)*log(e^(2*I*d*x + 2*I*c) + 1))/(d*e^(8*I*d*x + 8
*I*c) + 4*d*e^(6*I*d*x + 6*I*c) + 6*d*e^(4*I*d*x + 4*I*c) + 4*d*e^(2*I*d*x
+ 2*I*c) + d)
```

giac [B] time = 0.77, size = 222, normalized size = 1.90

$$\frac{-48i\,a^5e^{(8i\,dx+8i\,c)}\log\left(e^{(2i\,dx+2i\,c)}+1\right)-192i\,a^5e^{(6i\,dx+6i\,c)}\log\left(e^{(2i\,dx+2i\,c)}+1\right)-288i\,a^5e^{(4i\,dx+4i\,c)}\log\left(e^{(2i\,dx+2i\,c)}\right.}{3\left(de^{(8i\,dx+8i\,c)}+4\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^5,x, algorithm="giac")
```

```
[Out] 1/3*(-48*I*a^5*e^(8*I*d*x + 8*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 192*I*a^5
*e^(6*I*d*x + 6*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 288*I*a^5*e^(4*I*d*x +
4*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 192*I*a^5*e^(2*I*d*x + 2*I*c)*log(e^(
2*I*d*x + 2*I*c) + 1) - 192*I*a^5*e^(6*I*d*x + 6*I*c) - 432*I*a^5*e^(4*I*d*
x + 4*I*c) - 352*I*a^5*e^(2*I*d*x + 2*I*c) - 48*I*a^5*log(e^(2*I*d*x + 2*I*
c) + 1) - 100*I*a^5)/(d*e^(8*I*d*x + 8*I*c) + 4*d*e^(6*I*d*x + 6*I*c) + 6*d
*e^(4*I*d*x + 4*I*c) + 4*d*e^(2*I*d*x + 2*I*c) + d)
```

maple [A] time = 0.02, size = 101, normalized size = 0.86

$$-\frac{15a^5\tan(dx+c)}{d}+\frac{ia^5\left(\tan^4(dx+c)\right)}{4d}+\frac{5a^5\left(\tan^3(dx+c)\right)}{3d}-\frac{11ia^5\left(\tan^2(dx+c)\right)}{2d}+\frac{8ia^5\ln\left(1+\tan^2(dx+c)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^5,x)
```

```
[Out] -15*a^5*tan(d*x+c)/d+1/4*I/d*a^5*tan(d*x+c)^4+5/3/d*a^5*tan(d*x+c)^3-11/2*I
/d*a^5*tan(d*x+c)^2+8*I/d*a^5*ln(1+tan(d*x+c)^2)+16/d*a^5*arctan(tan(d*x+c)
)
```

maxima [A] time = 0.67, size = 165, normalized size = 1.41

$$a^5x+\frac{5\left(\tan\left(dx+c\right)^3+3\,dx+3\,c-3\,\tan\left(dx+c\right)\right)a^5}{3\,d}+\frac{10\,(dx+c-\tan\left(dx+c\right))a^5}{d}+\frac{i\,a^5\left(\frac{4\,\sin(dx+c)^2-3}{\sin(dx+c)^4-2\,\sin(dx+c)^2+1}-\right.}{4\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] a^5*x + 5/3*(tan(d*x + c)^3 + 3*d*x + 3*c - 3*tan(d*x + c))*a^5/d + 10*(d*x
 + c - tan(d*x + c))*a^5/d + 1/4*I*a^5*((4*sin(d*x + c)^2 - 3)/(sin(d*x + c
)^4 - 2*sin(d*x + c)^2 + 1) - 2*log(sin(d*x + c)^2 - 1))/d + 5*I*a^5*(1/(si
n(d*x + c)^2 - 1) - log(sin(d*x + c)^2 - 1))/d + 5*I*a^5*log(sec(d*x + c))/
d
```

mupad [B] time = 3.27, size = 73, normalized size = 0.62

$$\frac{a^5\,\ln\left(\tan\left(c+d\,x\right)+1\mathrm{i}\right)\,16\mathrm{i}-15\,a^5\,\tan\left(c+d\,x\right)-\frac{a^5\,\tan(c+d\,x)^2\,11\mathrm{i}}{2}+\frac{5\,a^5\,\tan(c+d\,x)^3}{3}+\frac{a^5\,\tan(c+d\,x)^4\,1\mathrm{i}}{4}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^5,x)
```

```
[Out] (a^5*log(tan(c + d*x) + 1i)*16i - 15*a^5*tan(c + d*x) - (a^5*tan(c + d*x)^2
*11i)/2 + (5*a^5*tan(c + d*x)^3)/3 + (a^5*tan(c + d*x)^4*1i)/4)/d
```

sympy [A] time = 0.48, size = 182, normalized size = 1.56

$$-\frac{16ia^5\log\left(e^{2idx}+e^{-2ic}\right)}{d}+\frac{-192a^5e^{6ic}e^{6idx}-432a^5e^{4ic}e^{4idx}-352a^5e^{2ic}e^{2idx}-100a^5}{-3ide^{8ic}e^{8idx}-12ide^{6ic}e^{6idx}-18ide^{4ic}e^{4idx}-12ide^{2ic}e^{2idx}-3id}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**5,x)
```

```
[Out] -16*I*a**5*log(exp(2*I*d*x) + exp(-2*I*c))/d + (-192*a**5*exp(6*I*c)*exp(6*
I*d*x) - 432*a**5*exp(4*I*c)*exp(4*I*d*x) - 352*a**5*exp(2*I*c)*exp(2*I*d*x
) - 100*a**5)/(-3*I*d*exp(8*I*c)*exp(8*I*d*x) - 12*I*d*exp(6*I*c)*exp(6*I*d
*x) - 18*I*d*exp(4*I*c)*exp(4*I*d*x) - 12*I*d*exp(2*I*c)*exp(2*I*d*x) - 3*I
*d)
```

3.64 $\int \cos^2(c+dx)(a+ia\tan(c+dx))^5\,dx$

Optimal. Leaf size=83

$$-\frac{8ia^6}{d(a-ia\tan(c+dx))}+\frac{ia^5\tan^2(c+dx)}{2d}+\frac{5a^5\tan(c+dx)}{d}+\frac{12ia^5\log(\cos(c+dx))}{d}-12a^5x$$

```
[Out] -12*a^5*x+12*I*a^5*ln(cos(d*x+c))/d+5*a^5*tan(d*x+c)/d+1/2*I*a^5*tan(d*x+c)
^2/d-8*I*a^6/d/(a-I*a*tan(d*x+c))
```

Rubi [A] time = 0.06, antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{ia^5\tan^2(c+dx)}{2d}-\frac{8ia^6}{d(a-ia\tan(c+dx))}+\frac{5a^5\tan(c+dx)}{d}+\frac{12ia^5\log(\cos(c+dx))}{d}-12a^5x$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] -12*a^5*x + ((12*I)*a^5*Log[Cos[c + d*x]])/d + (5*a^5*Tan[c + d*x])/d + ((I
/2)*a^5*Tan[c + d*x]^2)/d - ((8*I)*a^6)/(d*(a - I*a*Tan[c + d*x]))
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \cos^2(c+dx)(a+ia\tan(c+dx))^5\,dx &= -\frac{\left(ia^3\right)\text{Subst}\left(\int \frac{(a+x)^3}{(a-x)^2}\,dx,x,ia\tan(c+dx)\right)}{d}\\ &= -\frac{\left(ia^3\right)\text{Subst}\left(\int \left(5a+\frac{8a^3}{(a-x)^2}-\frac{12a^2}{a-x}+x\right)dx,x,ia\tan(c+dx)\right)}{d}\\ &= -12a^5x+\frac{12ia^5\log(\cos(c+dx))}{d}+\frac{5a^5\tan(c+dx)}{d}+\frac{ia^5\tan^2(c+d}{2d}\end{aligned}$$

Mathematica [B] time = 6.84, size = 649, normalized size = 7.82

$$\frac{(4\cos(3c)-4i\sin(3c))\sin(2dx)\cos^5(c+dx)(a+ia\tan(c+dx))^5}{d(\cos(dx)+i\sin(dx))^5}-\frac{12x\cos(5c)\cos^5(c+dx)(a+ia\tan(c+dx}{(\cos(dx)+i\sin(dx))^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (-12*x*Cos[5*c]*Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^5)/(Cos[d*x] + I*Sin[
d*x])^5 + ((6*I)*Cos[5*c]*Cos[c + d*x]^5*Log[Cos[c + d*x]^2]*(a + I*a*Tan[c
 + d*x])^5)/(d*(Cos[d*x] + I*Sin[d*x])^5) + (Cos[2*d*x]*Cos[c + d*x]^5*((-4
*I)*Cos[3*c] - 4*Sin[3*c])*(a + I*a*Tan[c + d*x])^5)/(d*(Cos[d*x] + I*Sin[d
*x])^5) + (Cos[c + d*x]^3*((I/2)*Cos[5*c] + Sin[5*c]/2)*(a + I*a*Tan[c + d*
x])^5)/(d*(Cos[d*x] + I*Sin[d*x])^5) + ((12*I)*x*Cos[c + d*x]^5*Sin[5*c]*(a
 + I*a*Tan[c + d*x])^5)/(Cos[d*x] + I*Sin[d*x])^5 + (6*Cos[c + d*x]^5*Log[C
os[c + d*x]^2]*Sin[5*c]*(a + I*a*Tan[c + d*x])^5)/(d*(Cos[d*x] + I*Sin[d*x]
)^5) + (Cos[c + d*x]^4*(5*Cos[5*c] - (5*I)*Sin[5*c])*Sin[d*x]*(a + I*a*Tan[
c + d*x])^5)/(d*(Cos[c/2] - Sin[c/2])*(Cos[c/2] + Sin[c/2])*(Cos[d*x] + I*S
in[d*x])^5) + (Cos[c + d*x]^5*(4*Cos[3*c] - (4*I)*Sin[3*c])*Sin[2*d*x]*(a +
 I*a*Tan[c + d*x])^5)/(d*(Cos[d*x] + I*Sin[d*x])^5) + (x*Cos[c + d*x]^5*(6*
Cos[c]^3 - 6*Cos[c]^5 - (24*I)*Cos[c]^2*Sin[c] + (36*I)*Cos[c]^4*Sin[c] - 3
6*Cos[c]*Sin[c]^2 + 90*Cos[c]^3*Sin[c]^2 + (24*I)*Sin[c]^3 - (120*I)*Cos[c]
^2*Sin[c]^3 - 90*Cos[c]*Sin[c]^4 + (36*I)*Sin[c]^5 + 6*Sin[c]^3*Tan[c] + 6*
Sin[c]^5*Tan[c] - I*(12*Cos[5*c] - (12*I)*Sin[5*c])*Tan[c])*(a + I*a*Tan[c
+ d*x])^5)/(Cos[d*x] + I*Sin[d*x])^5
```

fricas [A] time = 0.50, size = 123, normalized size = 1.48

$$\frac{-4i\,a^5e^{(6i\,dx+6i\,c)} - 8i\,a^5e^{(4i\,dx+4i\,c)} + 8i\,a^5e^{(2i\,dx+2i\,c)} + 10i\,a^5 + \left(12i\,a^5e^{(4i\,dx+4i\,c)} + 24i\,a^5e^{(2i\,dx+2i\,c)} + 12i\,a^5\right)\log\left(e^{(2i}\right.}{de^{(4i\,dx+4i\,c)} + 2\,de^{(2i\,dx+2i\,c)} + d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] (-4*I*a^5*e^(6*I*d*x + 6*I*c) - 8*I*a^5*e^(4*I*d*x + 4*I*c) + 8*I*a^5*e^(2*
I*d*x + 2*I*c) + 10*I*a^5 + (12*I*a^5*e^(4*I*d*x + 4*I*c) + 24*I*a^5*e^(2*I
*d*x + 2*I*c) + 12*I*a^5)*log(e^(2*I*d*x + 2*I*c) + 1))/(d*e^(4*I*d*x + 4*I
*c) + 2*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [A] time = 2.60, size = 145, normalized size = 1.75

$$\frac{12i\,a^5e^{(4i\,dx+4i\,c)}\log\left(e^{(2i\,dx+2i\,c)}+1\right) + 24i\,a^5e^{(2i\,dx+2i\,c)}\log\left(e^{(2i\,dx+2i\,c)}+1\right) - 4i\,a^5e^{(6i\,dx+6i\,c)} - 8i\,a^5e^{(4i\,dx+4i\,c)} + 8i\,a^5}{de^{(4i\,dx+4i\,c)} + 2\,de^{(2i\,dx+2i\,c)} + d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^5,x, algorithm="giac")
```

```
[Out] (12*I*a^5*e^(4*I*d*x + 4*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) + 24*I*a^5*e^(2*
I*d*x + 2*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 4*I*a^5*e^(6*I*d*x + 6*I*c) -
 8*I*a^5*e^(4*I*d*x + 4*I*c) + 8*I*a^5*e^(2*I*d*x + 2*I*c) + 12*I*a^5*log(e
^(2*I*d*x + 2*I*c) + 1) + 10*I*a^5)/(d*e^(4*I*d*x + 4*I*c) + 2*d*e^(2*I*d*x
 + 2*I*c) + d)
```

maple [B] time = 0.42, size = 175, normalized size = 2.11

$$\frac{ia^5\left(\sin^4(dx+c)\right)}{2d} - \frac{5ia^5\left(\cos^2(dx+c)\right)}{2d} + \frac{ia^5\left(\sin^6(dx+c)\right)}{2d\cos(dx+c)^2} + \frac{6ia^5\left(\sin^2(dx+c)\right)}{d} + \frac{5a^5\left(\sin^5(dx+c)\right)}{d\cos(dx+c)} + \frac{5a^5\cos(}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^5,x)
```

```
[Out] 1/2*I/d*a^5*sin(d*x+c)^4-5/2*I/d*a^5*cos(d*x+c)^2+1/2*I/d*a^5*sin(d*x+c)^6/
cos(d*x+c)^2+6*I/d*a^5*sin(d*x+c)^2+5/d*a^5*sin(d*x+c)^5/cos(d*x+c)+5/d*a^5
*cos(d*x+c)*sin(d*x+c)^3+13/d*a^5*sin(d*x+c)*cos(d*x+c)-12*a^5*x-12/d*a^5*c
+12*I*a^5*ln(cos(d*x+c))/d
```

maxima [A] time = 0.68, size = 86, normalized size = 1.04

$$-\frac{-i\,a^5\tan\left(dx+c\right)^2+24\,(dx+c)a^5+12i\,a^5\log\left(\tan\left(dx+c\right)^2+1\right)-10\,a^5\tan\left(dx+c\right)-\frac{16\left(a^5\tan(dx+c)-i\,a^5\right)}{\tan(dx+c)^2+1}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] -1/2*(-I*a^5*tan(d*x + c)^2 + 24*(d*x + c)*a^5 + 12*I*a^5*log(tan(d*x + c)^
2 + 1) - 10*a^5*tan(d*x + c) - 16*(a^5*tan(d*x + c) - I*a^5)/(tan(d*x + c)^
2 + 1))/d
```

mupad [B] time = 3.30, size = 70, normalized size = 0.84

$$\frac{8\,a^5}{d\,\left(\tan\left(c+d\,x\right)+1{}\mathrm{i}\right)}-\frac{a^5\,\ln\left(\tan\left(c+d\,x\right)+1{}\mathrm{i}\right)\,12{}\mathrm{i}}{d}+\frac{5\,a^5\,\tan\left(c+d\,x\right)}{d}+\frac{a^5\,{\tan\left(c+d\,x\right)}^2\,1{}\mathrm{i}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^5,x)
```

```
[Out] (8*a^5)/(d*(tan(c + d*x) + 1i)) - (a^5*log(tan(c + d*x) + 1i)*12i)/d + (5*a
^5*tan(c + d*x))/d + (a^5*tan(c + d*x)^2*1i)/(2*d)
```

sympy [A] time = 0.47, size = 134, normalized size = 1.61

$$\frac{12ia^5\log\left(e^{2idx}+e^{-2ic}\right)}{d}+\frac{-12a^5e^{2ic}e^{2idx}-10a^5}{ide^{4ic}e^{4idx}+2ide^{2ic}e^{2idx}+id}+\begin{cases}-\frac{4ia^5e^{2ic}e^{2idx}}{d} & \text{for}\ d\neq 0\\ 8a^5xe^{2ic} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2*(a+I*a*tan(d*x+c))**5,x)
```

```
[Out] 12*I*a**5*log(exp(2*I*d*x) + exp(-2*I*c))/d + (-12*a**5*exp(2*I*c)*exp(2*I*
d*x) - 10*a**5)/(I*d*exp(4*I*c)*exp(4*I*d*x) + 2*I*d*exp(2*I*c)*exp(2*I*d*x
) + I*d) + Piecewise((-4*I*a**5*exp(2*I*c)*exp(2*I*d*x)/d, Ne(d, 0)), (8*a*
*5*x*exp(2*I*c), True))
```

3.65 $\int \cos^4(c+dx)(a+ia\tan(c+dx))^5\,dx$

Optimal. Leaf size=73

$$-\frac{2ia^7}{d(a-ia\tan(c+dx))^2}+\frac{4ia^6}{d(a-ia\tan(c+dx))}-\frac{ia^5\log(\cos(c+dx))}{d}+a^5x$$

```
[Out] a^5*x-I*a^5*ln(cos(d*x+c))/d-2*I*a^7/d/(a-I*a*tan(d*x+c))^2+4*I*a^6/d/(a-I*
a*tan(d*x+c))
```

Rubi [A] time = 0.06, antiderivative size = 73, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$-\frac{2ia^7}{d(a-ia\tan(c+dx))^2}+\frac{4ia^6}{d(a-ia\tan(c+dx))}-\frac{ia^5\log(\cos(c+dx))}{d}+a^5x$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] a^5*x - (I*a^5*Log[Cos[c + d*x]])/d - ((2*I)*a^7)/(d*(a - I*a*Tan[c + d*x])
^2) + ((4*I)*a^6)/(d*(a - I*a*Tan[c + d*x]))
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \cos^4(c+dx)(a+ia\tan(c+dx))^5\,dx &= -\frac{\left(ia^5\right)\text{Subst}\left(\int \frac{(a+x)^2}{(a-x)^3}\,dx,x,ia\tan(c+dx)\right)}{d}\\ &= -\frac{\left(ia^5\right)\text{Subst}\left(\int \left(\frac{4a^2}{(a-x)^3}-\frac{4a}{(a-x)^2}+\frac{1}{a-x}\right)dx,x,ia\tan(c+dx)\right)}{d}\\ &= a^5x-\frac{ia^5\log(\cos(c+dx))}{d}-\frac{2ia^7}{d(a-ia\tan(c+dx))^2}+\frac{4ia^6}{d(a-ia\tan(c+d\end{aligned}$$

Mathematica [A] time = 0.77, size = 110, normalized size = 1.51

$$\frac{a^5(\cos(2c+7dx)+i\sin(2c+7dx))\left(\cos(2(c+dx))\left(-i\log\left(\cos^2(c+dx)\right)+2dx-i\right)+\sin(2(c+dx))\left(-\log\left(\cos\right.\right.\right.}{2d(\cos(dx)+i\sin(dx))^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (a^5*(2*I + Cos[2*(c + d*x)]*(-I + 2*d*x - I*Log[Cos[c + d*x]^2]) + (1 - (2
*I)*d*x - Log[Cos[c + d*x]^2])*Sin[2*(c + d*x)])*(Cos[2*c + 7*d*x] + I*Sin[
2*c + 7*d*x]))/(2*d*(Cos[d*x] + I*Sin[d*x])^5)
```

fricas [A] time = 0.59, size = 51, normalized size = 0.70

$$\frac{-i\,a^5e^{(4i\,dx+4i\,c)}+2i\,a^5e^{(2i\,dx+2i\,c)}-2i\,a^5\log\left(e^{(2i\,dx+2i\,c)}+1\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/2*(-I*a^5*e^(4*I*d*x + 4*I*c) + 2*I*a^5*e^(2*I*d*x + 2*I*c) - 2*I*a^5*log
(e^(2*I*d*x + 2*I*c) + 1))/d
```

giac [B] time = 3.47, size = 450, normalized size = 6.16

$$\frac{-384i\,a^5e^{(16i\,dx+8i\,c)}\log\left(e^{(2i\,dx+2i\,c)}+1\right)-3072i\,a^5e^{(14i\,dx+6i\,c)}\log\left(e^{(2i\,dx+2i\,c)}+1\right)-10752i\,a^5e^{(12i\,dx+4i\,c)}\log\left(e^{(2}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^5,x, algorithm="giac")
```

```
[Out] 1/384*(-384*I*a^5*e^(16*I*d*x + 8*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 3072*
I*a^5*e^(14*I*d*x + 6*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 10752*I*a^5*e^(12
*I*d*x + 4*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 21504*I*a^5*e^(10*I*d*x + 2*
I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 21504*I*a^5*e^(6*I*d*x - 2*I*c)*log(e^(
2*I*d*x + 2*I*c) + 1) - 10752*I*a^5*e^(4*I*d*x - 4*I*c)*log(e^(2*I*d*x + 2*
I*c) + 1) - 3072*I*a^5*e^(2*I*d*x - 6*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 2
6880*I*a^5*e^(8*I*d*x)*log(e^(2*I*d*x + 2*I*c) + 1) - 384*I*a^5*e^(-8*I*c)*
log(e^(2*I*d*x + 2*I*c) + 1) - 192*I*a^5*e^(20*I*d*x + 12*I*c) - 1152*I*a^5
*e^(18*I*d*x + 10*I*c) - 2304*I*a^5*e^(16*I*d*x + 8*I*c) + 8064*I*a^5*e^(12
*I*d*x + 4*I*c) + 16128*I*a^5*e^(10*I*d*x + 2*I*c) + 9216*I*a^5*e^(6*I*d*x
- 2*I*c) + 2880*I*a^5*e^(4*I*d*x - 4*I*c) + 384*I*a^5*e^(2*I*d*x - 6*I*c) +
 16128*I*a^5*e^(8*I*d*x))/(d*e^(16*I*d*x + 8*I*c) + 8*d*e^(14*I*d*x + 6*I*c
) + 28*d*e^(12*I*d*x + 4*I*c) + 56*d*e^(10*I*d*x + 2*I*c) + 56*d*e^(6*I*d*x
 - 2*I*c) + 28*d*e^(4*I*d*x - 4*I*c) + 8*d*e^(2*I*d*x - 6*I*c) + 70*d*e^(8*
I*d*x) + d*e^(-8*I*c))
```

maple [B] time = 0.47, size = 146, normalized size = 2.00

$$-\frac{11ia^5\left(\sin^4(dx+c)\right)}{4d}-\frac{ia^5\ln(\cos(dx+c))}{d}-\frac{ia^5\left(\sin^2(dx+c)\right)}{2d}-\frac{5a^5\cos(dx+c)\left(\sin^3(dx+c)\right)}{4d}-\frac{11a^5\sin(dx}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^5,x)
```

```
[Out] -11/4*I/d*a^5*sin(d*x+c)^4-I*a^5*ln(cos(d*x+c))/d-1/2*I/d*a^5*sin(d*x+c)^2-
5/4/d*a^5*cos(d*x+c)*sin(d*x+c)^3-11/4/d*a^5*sin(d*x+c)*cos(d*x+c)+a^5*x+1/
d*a^5*c-5/4*I/d*a^5*cos(d*x+c)^4+11/4/d*a^5*sin(d*x+c)*cos(d*x+c)^3
```

maxima [A] time = 0.57, size = 88, normalized size = 1.21

$$\frac{8\,(dx+c)a^5+4i\,a^5\log\left(\tan(dx+c)^2+1\right)-\frac{32\,a^5\tan(dx+c)^3-48i\,a^5\tan(dx+c)^2-16i\,a^5}{\tan(dx+c)^4+2\,\tan(dx+c)^2+1}}{8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] 1/8*(8*(d*x + c)*a^5 + 4*I*a^5*log(tan(d*x + c)^2 + 1) - (32*a^5*tan(d*x +
c)^3 - 48*I*a^5*tan(d*x + c)^2 - 16*I*a^5)/(tan(d*x + c)^4 + 2*tan(d*x + c)
^2 + 1))/d
```

mupad [B] time = 3.31, size = 64, normalized size = 0.88

$$\frac{a^5\,\ln\left(\tan\left(c+d\,x\right)+1{}\mathrm{i}\right)\,1{}\mathrm{i}}{d}-\frac{4\,a^5\,\tan\left(c+d\,x\right)+a^5\,2{}\mathrm{i}}{d\,\left({\tan\left(c+d\,x\right)}^2+\tan\left(c+d\,x\right)\,2{}\mathrm{i}-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^5,x)
```

```
[Out] (a^5*log(tan(c + d*x) + 1i)*1i)/d - (4*a^5*tan(c + d*x) + a^5*2i)/(d*(tan(c
 + d*x)*2i + tan(c + d*x)^2 - 1))
```

sympy [A] time = 0.48, size = 104, normalized size = 1.42

$$-\frac{ia^{5}\log\left(e^{2idx}+e^{-2ic}\right)}{d}+\begin{cases}\frac{-ia^{5}de^{4ic}e^{4idx}+2ia^{5}de^{2ic}e^{2idx}}{2d^{2}} & \text{for}\: 2d^{2}\neq 0\\x\left(2a^{5}e^{4ic}-2a^{5}e^{2ic}\right) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4*(a+I*a*tan(d*x+c))**5,x)
```

```
[Out] -I*a**5*log(exp(2*I*d*x) + exp(-2*I*c))/d + Piecewise(((-I*a**5*d*exp(4*I*c
)*exp(4*I*d*x) + 2*I*a**5*d*exp(2*I*c)*exp(2*I*d*x))/(2*d**2), Ne(2*d**2, 0
)), (x*(2*a**5*exp(4*I*c) - 2*a**5*exp(2*I*c)), True))
```

3.66 $\int \cos^6(c+dx)(a+ia\tan(c+dx))^5\,dx$

Optimal. Leaf size=55

$$\frac{ia^7}{2d(a-ia\tan(c+dx))^2}-\frac{2ia^8}{3d(a-ia\tan(c+dx))^3}$$

```
[Out] -2/3*I*a^8/d/(a-I*a*tan(d*x+c))^3+1/2*I*a^7/d/(a-I*a*tan(d*x+c))^2
```

Rubi [A] time = 0.05, antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{ia^7}{2d(a-ia\tan(c+dx))^2}-\frac{2ia^8}{3d(a-ia\tan(c+dx))^3}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^6*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (((-2*I)/3)*a^8)/(d*(a - I*a*Tan[c + d*x])^3) + ((I/2)*a^7)/(d*(a - I*a*Tan
[c + d*x])^2)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \cos^6(c+dx)(a+ia\tan(c+dx))^5\,dx &= -\frac{\left(ia^7\right)\operatorname{Subst}\left(\int \frac{a+x}{(a-x)^4}\,dx,x,ia\tan(c+dx)\right)}{d}\\ &= -\frac{\left(ia^7\right)\operatorname{Subst}\left(\int \left(\frac{2a}{(a-x)^4}-\frac{1}{(a-x)^3}\right)dx,x,ia\tan(c+dx)\right)}{d}\\ &= -\frac{2ia^8}{3d(a-ia\tan(c+dx))^3}+\frac{ia^7}{2d(a-ia\tan(c+dx))^2}\end{aligned}$$

Mathematica [A] time = 0.56, size = 50, normalized size = 0.91

$$\frac{a^5(5\cos(c+dx)-i\sin(c+dx))(\sin(5(c+dx))-i\cos(5(c+dx)))}{24d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^6*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (a^5*(5*Cos[c + d*x] - I*Sin[c + d*x])*((-I)*Cos[5*(c + d*x)] + Sin[5*(c +
d*x)]))/(24*d)
```

fricas [A] time = 0.90, size = 34, normalized size = 0.62

$$\frac{-2i\,a^5e^{(6i\,dx+6i\,c)}-3i\,a^5e^{(4i\,dx+4i\,c)}}{24\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/24*(-2*I*a^5*e^(6*I*d*x + 6*I*c) - 3*I*a^5*e^(4*I*d*x + 4*I*c))/d
```

giac [B] time = 3.51, size = 187, normalized size = 3.40

$$\frac{-32i\,a^5e^{(18i\,dx+12i\,c)}-240i\,a^5e^{(16i\,dx+10i\,c)}-768i\,a^5e^{(14i\,dx+8i\,c)}-1360i\,a^5e^{(12i\,dx+6i\,c)}-1440i\,a^5e^{(10i\,dx+4i\,c)}-912i\,a^5e}{384\left(de^{(12i\,dx+6i\,c)}+6\,de^{(10i\,dx+4i\,c)}+15\,de^{(8i\,dx+2i\,c)}+15\,de^{(4i\,dx-2i\,c)}+6\,de^{(2i\,dx-4i\,c)}+20\,d\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^5,x, algorithm="giac")
```

```
[Out] 1/384*(-32*I*a^5*e^(18*I*d*x + 12*I*c) - 240*I*a^5*e^(16*I*d*x + 10*I*c) -
768*I*a^5*e^(14*I*d*x + 8*I*c) - 1360*I*a^5*e^(12*I*d*x + 6*I*c) - 1440*I*a
^5*e^(10*I*d*x + 4*I*c) - 912*I*a^5*e^(8*I*d*x + 2*I*c) - 48*I*a^5*e^(4*I*d
*x - 2*I*c) - 320*I*a^5*e^(6*I*d*x))/(d*e^(12*I*d*x + 6*I*c) + 6*d*e^(10*I*
d*x + 4*I*c) + 15*d*e^(8*I*d*x + 2*I*c) + 15*d*e^(4*I*d*x - 2*I*c) + 6*d*e^
(2*I*d*x - 4*I*c) + 20*d*e^(6*I*d*x) + d*e^(-6*I*c))
```

maple [B] time = 0.52, size = 231, normalized size = 4.20

$$\frac{\frac{ia^5\left(\sin^6(dx+c)\right)}{6}+5a^5\left(-\frac{\left(\sin^3(dx+c)\right)\left(\cos^3(dx+c)\right)}{6}-\frac{\sin(dx+c)\left(\cos^3(dx+c)\right)}{8}+\frac{\cos(dx+c)\sin(dx+c)}{16}+\frac{dx}{16}+\frac{c}{16}\right)-10ia^5\left(-\frac{\left(\sin^2(dx+c)\right)}{6}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^5,x)
```

```
[Out] 1/d*(1/6*I*a^5*sin(d*x+c)^6+5*a^5*(-1/6*sin(d*x+c)^3*cos(d*x+c)^3-1/8*sin(d
*x+c)*cos(d*x+c)^3+1/16*cos(d*x+c)*sin(d*x+c)+1/16*d*x+1/16*c)-10*I*a^5*(-1
/6*sin(d*x+c)^2*cos(d*x+c)^4-1/12*cos(d*x+c)^4)-10*a^5*(-1/6*sin(d*x+c)*cos
(d*x+c)^5+1/24*(cos(d*x+c)^3+3/2*cos(d*x+c))*sin(d*x+c)+1/16*d*x+1/16*c)-5/
6*I*a^5*cos(d*x+c)^6+a^5*(1/6*(cos(d*x+c)^5+5/4*cos(d*x+c)^3+15/8*cos(d*x+c
))*sin(d*x+c)+5/16*d*x+5/16*c))
```

maxima [B] time = 0.93, size = 93, normalized size = 1.69

$$\frac{-24i\,a^5\tan\left(dx+c\right)^4-80\,a^5\tan\left(dx+c\right)^3+96i\,a^5\tan\left(dx+c\right)^2+48\,a^5\tan\left(dx+c\right)-8i\,a^5}{48\left(\tan\left(dx+c\right)^6+3\,\tan\left(dx+c\right)^4+3\,\tan\left(dx+c\right)^2+1\right)d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] 1/48*(-24*I*a^5*tan(d*x + c)^4 - 80*a^5*tan(d*x + c)^3 + 96*I*a^5*tan(d*x +
 c)^2 + 48*a^5*tan(d*x + c) - 8*I*a^5)/((tan(d*x + c)^6 + 3*tan(d*x + c)^4
+ 3*tan(d*x + c)^2 + 1)*d)
```

mupad [B] time = 3.28, size = 53, normalized size = 0.96

$$\frac{a^5\,\left(1+\tan\left(c+d\,x\right)\,3{}\mathrm{i}\right)}{6\,d\,\left(-{\tan\left(c+d\,x\right)}^3-{\tan\left(c+d\,x\right)}^2\,3{}\mathrm{i}+3\,\tan\left(c+d\,x\right)+1{}\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^5,x)
```

```
[Out] (a^5*(tan(c + d*x)*3i + 1))/(6*d*(3*tan(c + d*x) - tan(c + d*x)^2*3i - tan(
c + d*x)^3 + 1i))
```

sympy [A] time = 0.48, size = 82, normalized size = 1.49

$$\begin{cases} \frac{-8ia^5de^{6ic}e^{6idx}-12ia^5de^{4ic}e^{4idx}}{96d^2} & \text{for } 96d^2 \neq 0 \\ x\left(\frac{a^5e^{6ic}}{2}+\frac{a^5e^{4ic}}{2}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**6*(a+I*a*tan(d*x+c))**5,x)
```

```
[Out] Piecewise(((-8*I*a**5*d*exp(6*I*c)*exp(6*I*d*x) - 12*I*a**5*d*exp(4*I*c)*ex
p(4*I*d*x))/(96*d**2), Ne(96*d**2, 0)), (x*(a**5*exp(6*I*c)/2 + a**5*exp(4*
I*c)/2), True))
```

3.67 $\int \cos^8(c+dx)(a+ia\tan(c+dx))^5\,dx$

Optimal. Leaf size=27

$$-\frac{ia^9}{4d(a-ia\tan(c+dx))^4}$$

```
[Out] -1/4*I*a^9/d/(a-I*a*tan(d*x+c))^4
```

Rubi [A] time = 0.04, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = $\{3487, 32\}$

$$-\frac{ia^9}{4d(a-ia\tan(c+dx))^4}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^8*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] ((-I/4)*a^9)/(d*(a - I*a*Tan[c + d*x])^4)
```

Rule 32

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \cos^8(c+dx)(a+ia\tan(c+dx))^5\,dx &= -\frac{\left(ia^9\right)\operatorname{Subst}\left(\int \frac{1}{(a-x)^5}\,dx, x, ia\tan(c+dx)\right)}{d}\\ &= -\frac{ia^9}{4d(a-ia\tan(c+dx))^4}\end{aligned}$$

Mathematica [B] time = 1.11, size = 73, normalized size = 2.70

$$\frac{a^5(-i(2\sin(c+dx)+3\sin(3(c+dx)))+10\cos(c+dx)+5\cos(3(c+dx)))(\sin(5(c+dx))-i\cos(5(c+dx)))}{64d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^8*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (a^5*(10*Cos[c + d*x] + 5*Cos[3*(c + d*x)] - I*(2*Sin[c + d*x] + 3*Sin[3*(c
 + d*x)]))*((-I)*Cos[5*(c + d*x)] + Sin[5*(c + d*x)]))/(64*d)
```

fricas [B] time = 0.60, size = 62, normalized size = 2.30

$$\frac{-i\,a^5e^{(8i\,dx+8i\,c)}-4i\,a^5e^{(6i\,dx+6i\,c)}-6i\,a^5e^{(4i\,dx+4i\,c)}-4i\,a^5e^{(2i\,dx+2i\,c)}}{64\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^8*(a+I*a*tan(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/64*(-I*a^5*e^(8*I*d*x + 8*I*c) - 4*I*a^5*e^(6*I*d*x + 6*I*c) - 6*I*a^5*e^
(4*I*d*x + 4*I*c) - 4*I*a^5*e^(2*I*d*x + 2*I*c))/d
```

giac [B] time = 4.72, size = 267, normalized size = 9.89

$$\frac{-24i\,a^5e^{(24i\,dx+16i\,c)} - 288i\,a^5e^{(22i\,dx+14i\,c)} - 1584i\,a^5e^{(20i\,dx+12i\,c)} - 5280i\,a^5e^{(18i\,dx+10i\,c)} - 11856i\,a^5e^{(16i\,dx+8i\,c)} - 1}{1536\left(de^{(16i\,dx+8i\,c)} + 8\,de^{(14i\,dx+6i\,c)} + 28\,de^{(12i\,dx+4i\,c)} + 5\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^8*(a+I*a*tan(d*x+c))^5,x, algorithm="giac")
```

```
[Out] 1/1536*(-24*I*a^5*e^(24*I*d*x + 16*I*c) - 288*I*a^5*e^(22*I*d*x + 14*I*c) -
 1584*I*a^5*e^(20*I*d*x + 12*I*c) - 5280*I*a^5*e^(18*I*d*x + 10*I*c) - 1185
6*I*a^5*e^(16*I*d*x + 8*I*c) - 18816*I*a^5*e^(14*I*d*x + 6*I*c) - 21504*I*a
^5*e^(12*I*d*x + 4*I*c) - 17664*I*a^5*e^(10*I*d*x + 2*I*c) - 3936*I*a^5*e^(
6*I*d*x - 2*I*c) - 912*I*a^5*e^(4*I*d*x - 4*I*c) - 96*I*a^5*e^(2*I*d*x - 6*
I*c) - 10200*I*a^5*e^(8*I*d*x))/(d*e^(16*I*d*x + 8*I*c) + 8*d*e^(14*I*d*x +
 6*I*c) + 28*d*e^(12*I*d*x + 4*I*c) + 56*d*e^(10*I*d*x + 2*I*c) + 56*d*e^(6
*I*d*x - 2*I*c) + 28*d*e^(4*I*d*x - 4*I*c) + 8*d*e^(2*I*d*x - 6*I*c) + 70*d
*e^(8*I*d*x) + d*e^(-8*I*c))
```

maple [B] time = 0.60, size = 301, normalized size = 11.15

$$\frac{ia^5\left(-\frac{\left(\sin^4(dx+c)\right)\left(\cos^4(dx+c)\right)}{8} - \frac{\left(\sin^2(dx+c)\right)\left(\cos^4(dx+c)\right)}{12} - \frac{\left(\cos^4(dx+c)\right)}{24}\right) + 5a^5\left(-\frac{\left(\sin^3(dx+c)\right)\left(\cos^5(dx+c)\right)}{8} - \frac{\sin(dx+c)\left(\cos^5(dx+\right.}{16}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^8*(a+I*a*tan(d*x+c))^5,x)
```

```
[Out] 1/d*(I*a^5*(-1/8*sin(d*x+c)^4*cos(d*x+c)^4-1/12*sin(d*x+c)^2*cos(d*x+c)^4-1
/24*cos(d*x+c)^4)+5*a^5*(-1/8*sin(d*x+c)^3*cos(d*x+c)^5-1/16*sin(d*x+c)*cos
(d*x+c)^5+1/64*(cos(d*x+c)^3+3/2*cos(d*x+c))*sin(d*x+c)+3/128*d*x+3/128*c)-
10*I*a^5*(-1/8*sin(d*x+c)^2*cos(d*x+c)^6-1/24*cos(d*x+c)^6)-10*a^5*(-1/8*si
n(d*x+c)*cos(d*x+c)^7+1/48*(cos(d*x+c)^5+5/4*cos(d*x+c)^3+15/8*cos(d*x+c))*
sin(d*x+c)+5/128*d*x+5/128*c)-5/8*I*a^5*cos(d*x+c)^8+a^5*(1/8*(cos(d*x+c)^7
+7/6*cos(d*x+c)^5+35/24*cos(d*x+c)^3+35/16*cos(d*x+c))*sin(d*x+c)+35/128*d*
x+35/128*c))
```

maxima [B] time = 0.73, size = 103, normalized size = 3.81

$$\frac{-96i\,a^5\tan(dx+c)^4 - 384\,a^5\tan(dx+c)^3 + 576i\,a^5\tan(dx+c)^2 + 384\,a^5\tan(dx+c) - 96i\,a^5}{384\left(\tan(dx+c)^8 + 4\,\tan(dx+c)^6 + 6\,\tan(dx+c)^4 + 4\,\tan(dx+c)^2 + 1\right)d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^8*(a+I*a*tan(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] 1/384*(-96*I*a^5*tan(d*x + c)^4 - 384*a^5*tan(d*x + c)^3 + 576*I*a^5*tan(d*
x + c)^2 + 384*a^5*tan(d*x + c) - 96*I*a^5)/((tan(d*x + c)^8 + 4*tan(d*x +
c)^6 + 6*tan(d*x + c)^4 + 4*tan(d*x + c)^2 + 1)*d)
```

mupad [B] time = 3.30, size = 63, normalized size = 2.33

$$-\frac{\frac{a^5\cos(c+d\,x)^4\,1\mathrm{i}}{4} + a^5\cos(c+d\,x)^6\,\left(\tan(c+d\,x) - 2\mathrm{i}\right) - 2\,a^5\cos(c+d\,x)^8\,\left(\tan(c+d\,x) - \mathrm{i}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^8*(a + a*tan(c + d*x)*1i)^5,x)
```

```
[Out] -((a^5*cos(c + d*x)^4*1i)/4 + a^5*cos(c + d*x)^6*(tan(c + d*x) - 2i) - 2*a^
5*cos(c + d*x)^8*(tan(c + d*x) - 1i))/d
```

sympy [**B**] time = 0.62, size = 163, normalized size = 6.04

$$\begin{cases} \frac{-8192ia^5d^3e^{8ic}e^{8idx}-32768ia^5d^3e^{6ic}e^{6idx}-49152ia^5d^3e^{4ic}e^{4idx}-32768ia^5d^3e^{2ic}e^{2idx}}{524288d^4} & \text{for } 524288d^4 \neq 0 \\ x\left(\frac{a^5e^{8ic}}{8}+\frac{3a^5e^{6ic}}{8}+\frac{3a^5e^{4ic}}{8}+\frac{a^5e^{2ic}}{8}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**8*(a+I*a*tan(d*x+c))**5,x)
```

```
[Out] Piecewise(((-8192*I*a**5*d**3*exp(8*I*c)*exp(8*I*d*x) - 32768*I*a**5*d**3*e
xp(6*I*c)*exp(6*I*d*x) - 49152*I*a**5*d**3*exp(4*I*c)*exp(4*I*d*x) - 32768*
I*a**5*d**3*exp(2*I*c)*exp(2*I*d*x))/(524288*d**4), Ne(524288*d**4, 0)), (x
*(a**5*exp(8*I*c)/8 + 3*a**5*exp(6*I*c)/8 + 3*a**5*exp(4*I*c)/8 + a**5*exp(
2*I*c)/8), True))
```

3.68 $\int \cos^{10}(c+dx)(a+ia\tan(c+dx))^5\,dx$

Optimal. Leaf size=144

$$-\frac{ia^{10}}{10d(a-ia\tan(c+dx))^5}-\frac{ia^9}{16d(a-ia\tan(c+dx))^4}-\frac{ia^8}{24d(a-ia\tan(c+dx))^3}-\frac{ia^7}{32d(a-ia\tan(c+dx))^2}-\frac{}{32d(}$$

```
[Out] 1/32*a^5*x-1/10*I*a^10/d/(a-I*a*tan(d*x+c))^5-1/16*I*a^9/d/(a-I*a*tan(d*x+c
))^4-1/24*I*a^8/d/(a-I*a*tan(d*x+c))^3-1/32*I*a^7/d/(a-I*a*tan(d*x+c))^2-1/
32*I*a^6/d/(a-I*a*tan(d*x+c))
```

Rubi [A] time = 0.09, antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {3487, 44, 206}

$$-\frac{ia^{10}}{10d(a-ia\tan(c+dx))^5}-\frac{ia^9}{16d(a-ia\tan(c+dx))^4}-\frac{ia^8}{24d(a-ia\tan(c+dx))^3}-\frac{ia^7}{32d(a-ia\tan(c+dx))^2}-\frac{}{32d(}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^10*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (a^5*x)/32 - ((I/10)*a^10)/(d*(a - I*a*Tan[c + d*x])^5) - ((I/16)*a^9)/(d*(
a - I*a*Tan[c + d*x])^4) - ((I/24)*a^8)/(d*(a - I*a*Tan[c + d*x])^3) - ((I/
32)*a^7)/(d*(a - I*a*Tan[c + d*x])^2) - ((I/32)*a^6)/(d*(a - I*a*Tan[c + d*
x]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 206

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^{10}(c+dx)(a+ia\tan(c+dx))^5\,dx = -\frac{(ia^{11})\,\text{Subst}\left(\int \frac{1}{(a-x)^6(a+x)}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{(ia^{11})\,\text{Subst}\left(\int \left(\frac{1}{2a(a-x)^6} + \frac{1}{4a^2(a-x)^5} + \frac{1}{8a^3(a-x)^4} + \frac{1}{16a^4(a-x)^3} + \frac{1}{32a^5(a-x)^{\cdots}}\right.\right.}{d}$$

$$= -\frac{ia^{10}}{10d(a-ia\tan(c+dx))^5} - \frac{ia^9}{16d(a-ia\tan(c+dx))^4} - \frac{ia^8}{24d(a-ia\tan\cdots}$$

$$= \frac{a^5x}{32} - \frac{ia^{10}}{10d(a-ia\tan(c+dx))^5} - \frac{ia^9}{16d(a-ia\tan(c+dx))^4} - \frac{\cdots}{24d(a-i\cdots}$$

Mathematica [A] time = 1.25, size = 137, normalized size = 0.95

$$\frac{a^5(-100\sin(c+dx) - 225\sin(3(c+dx)) - 120idx\sin(5(c+dx)) + 12\sin(5(c+dx)) - 500i\cos(c+dx) - 375i\,\text{c}\cdots}{3840d(\cos(dx) + i\sin(\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^10*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (a^5*((-500*I)*Cos[c + d*x] - (375*I)*Cos[3*(c + d*x)] - (12*I)*Cos[5*(c +
d*x)] + 120*d*x*Cos[5*(c + d*x)] - 100*Sin[c + d*x] - 225*Sin[3*(c + d*x)]
+ 12*Sin[5*(c + d*x)] - (120*I)*d*x*Sin[5*(c + d*x)])*(Cos[5*(c + 2*d*x)] +
 I*Sin[5*(c + 2*d*x)]))/(3840*d*(Cos[d*x] + I*Sin[d*x])^5)
```

fricas [A] time = 0.74, size = 83, normalized size = 0.58

$$\frac{120\,a^5dx - 12i\,a^5e^{(10i\,dx+10i\,c)} - 75i\,a^5e^{(8i\,dx+8i\,c)} - 200i\,a^5e^{(6i\,dx+6i\,c)} - 300i\,a^5e^{(4i\,dx+4i\,c)} - 300i\,a^5e^{(2i\,dx+2i\,c)}}{3840\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^10*(a+I*a*tan(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/3840*(120*a^5*d*x - 12*I*a^5*e^(10*I*d*x + 10*I*c) - 75*I*a^5*e^(8*I*d*x
+ 8*I*c) - 200*I*a^5*e^(6*I*d*x + 6*I*c) - 300*I*a^5*e^(4*I*d*x + 4*I*c) -
300*I*a^5*e^(2*I*d*x + 2*I*c))/d
```

giac [B] time = 6.40, size = 857, normalized size = 5.95

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^10*(a+I*a*tan(d*x+c))^5,x, algorithm="giac")
```

```
[Out] 1/30720*(960*a^5*d*x*e^(16*I*d*x + 8*I*c) + 7680*a^5*d*x*e^(14*I*d*x + 6*I*
c) + 26880*a^5*d*x*e^(12*I*d*x + 4*I*c) + 53760*a^5*d*x*e^(10*I*d*x + 2*I*c
) + 53760*a^5*d*x*e^(6*I*d*x - 2*I*c) + 26880*a^5*d*x*e^(4*I*d*x - 4*I*c) +
 7680*a^5*d*x*e^(2*I*d*x - 6*I*c) + 67200*a^5*d*x*e^(8*I*d*x) + 960*a^5*d*x
*e^(-8*I*c) - 390*I*a^5*e^(16*I*d*x + 8*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) -
 3120*I*a^5*e^(14*I*d*x + 6*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 10920*I*a^5
*e^(12*I*d*x + 4*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 21840*I*a^5*e^(10*I*d*
x + 2*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 21840*I*a^5*e^(6*I*d*x - 2*I*c)*l
og(e^(2*I*d*x + 2*I*c) + 1) - 10920*I*a^5*e^(4*I*d*x - 4*I*c)*log(e^(2*I*d*
x + 2*I*c) + 1) - 3120*I*a^5*e^(2*I*d*x - 6*I*c)*log(e^(2*I*d*x + 2*I*c) +
1) - 27300*I*a^5*e^(8*I*d*x)*log(e^(2*I*d*x + 2*I*c) + 1) - 390*I*a^5*e^(-8
```

```
*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) + 390*I*a^5*e^(16*I*d*x + 8*I*c)*log(e^(
2*I*d*x) + e^(-2*I*c)) + 3120*I*a^5*e^(14*I*d*x + 6*I*c)*log(e^(2*I*d*x) +
e^(-2*I*c)) + 10920*I*a^5*e^(12*I*d*x + 4*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)
) + 21840*I*a^5*e^(10*I*d*x + 2*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 21840*
I*a^5*e^(6*I*d*x - 2*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 10920*I*a^5*e^(4*
I*d*x - 4*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 3120*I*a^5*e^(2*I*d*x - 6*I*
c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 27300*I*a^5*e^(8*I*d*x)*log(e^(2*I*d*x)
+ e^(-2*I*c)) + 390*I*a^5*e^(-8*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) - 96*I*a
^5*e^(26*I*d*x + 18*I*c) - 1368*I*a^5*e^(24*I*d*x + 16*I*c) - 9088*I*a^5*e^
(22*I*d*x + 14*I*c) - 37376*I*a^5*e^(20*I*d*x + 12*I*c) - 106720*I*a^5*e^(1
8*I*d*x + 10*I*c) - 223376*I*a^5*e^(16*I*d*x + 8*I*c) - 349888*I*a^5*e^(14*
I*d*x + 6*I*c) - 409568*I*a^5*e^(12*I*d*x + 4*I*c) - 352096*I*a^5*e^(10*I*d
*x + 2*I*c) - 88000*I*a^5*e^(6*I*d*x - 2*I*c) - 21600*I*a^5*e^(4*I*d*x - 4*
I*c) - 2400*I*a^5*e^(2*I*d*x - 6*I*c) - 215000*I*a^5*e^(8*I*d*x))/(d*e^(16*
I*d*x + 8*I*c) + 8*d*e^(14*I*d*x + 6*I*c) + 28*d*e^(12*I*d*x + 4*I*c) + 56*
d*e^(10*I*d*x + 2*I*c) + 56*d*e^(6*I*d*x - 2*I*c) + 28*d*e^(4*I*d*x - 4*I*c
) + 8*d*e^(2*I*d*x - 6*I*c) + 70*d*e^(8*I*d*x) + d*e^(-8*I*c))
```

maple [B] time = 0.62, size = 331, normalized size = 2.30

$$ia^5\left(-\frac{(\sin^4(dx+c))(\cos^6(dx+c))}{10}-\frac{(\sin^2(dx+c))(\cos^6(dx+c))}{20}-\frac{(\cos^6(dx+c))}{60}\right)+5a^5\left(-\frac{(\sin^3(dx+c))(\cos^7(dx+c))}{10}-\frac{3\sin(dx+c)(\cos^7(dx}{80}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^10*(a+I*a*tan(d*x+c))^5,x)
```

```
[Out] 1/d*(I*a^5*(-1/10*sin(d*x+c)^4*cos(d*x+c)^6-1/20*sin(d*x+c)^2*cos(d*x+c)^6-
1/60*cos(d*x+c)^6)+5*a^5*(-1/10*sin(d*x+c)^3*cos(d*x+c)^7-3/80*sin(d*x+c)*c
os(d*x+c)^7+1/160*(cos(d*x+c)^5+5/4*cos(d*x+c)^3+15/8*cos(d*x+c))*sin(d*x+c
)+3/256*d*x+3/256*c)-10*I*a^5*(-1/10*sin(d*x+c)^2*cos(d*x+c)^8-1/40*cos(d*x
+c)^8)-10*a^5*(-1/10*sin(d*x+c)*cos(d*x+c)^9+1/80*(cos(d*x+c)^7+7/6*cos(d*x
+c)^5+35/24*cos(d*x+c)^3+35/16*cos(d*x+c))*sin(d*x+c)+7/256*d*x+7/256*c)-1/
2*I*a^5*cos(d*x+c)^10+a^5*(1/10*(cos(d*x+c)^9+9/8*cos(d*x+c)^7+21/16*cos(d*
x+c)^5+105/64*cos(d*x+c)^3+315/128*cos(d*x+c))*sin(d*x+c)+63/256*d*x+63/256
*c))
```

maxima [A] time = 0.65, size = 164, normalized size = 1.14

$$\frac{120\,(dx+c)a^5+\frac{120\,a^5\tan(dx+c)^9+560\,a^5\tan(dx+c)^7+1024\,a^5\tan(dx+c)^5-640i\,a^5\tan(dx+c)^4-1840\,a^5\tan(dx+c)^3+4480i\,a^5\tan(dx+c)^2+3}{\tan(dx+c)^{10}+5\,\tan(dx+c)^8+10\,\tan(dx+c)^6+10\,\tan(dx+c)^4+5\,\tan(dx+c)^2+1}}{3840\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^10*(a+I*a*tan(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] 1/3840*(120*(d*x + c)*a^5 + (120*a^5*tan(d*x + c)^9 + 560*a^5*tan(d*x + c)^
7 + 1024*a^5*tan(d*x + c)^5 - 640*I*a^5*tan(d*x + c)^4 - 1840*a^5*tan(d*x +
 c)^3 + 4480*I*a^5*tan(d*x + c)^2 + 3720*a^5*tan(d*x + c) - 1024*I*a^5)/(ta
n(d*x + c)^10 + 5*tan(d*x + c)^8 + 10*tan(d*x + c)^6 + 10*tan(d*x + c)^4 +
5*tan(d*x + c)^2 + 1))/d
```

mupad [B] time = 3.64, size = 122, normalized size = 0.85

$$\frac{a^5\,x}{32}+\frac{\frac{a^5\,\tan(c+d\,x)^4}{32}+\frac{a^5\,\tan(c+d\,x)^3\,5\mathrm{i}}{32}-\frac{31\,a^5\,\tan(c+d\,x)^2}{96}-\frac{a^5\,\tan(c+d\,x)\,35\mathrm{i}}{96}+\frac{4\,a^5}{15}}{d\,\left(\tan\left(c+d\,x\right)^5+\tan\left(c+d\,x\right)^4\,5\mathrm{i}-10\,\tan\left(c+d\,x\right)^3-\tan\left(c+d\,x\right)^2\,10\mathrm{i}+5\,\tan\left(c+d\,x\right)+1\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^10*(a + a*tan(c + d*x)*1i)^5,x)
```

```
[Out] (a^5*x)/32 + ((4*a^5)/15 - (a^5*tan(c + d*x)*35i)/96 - (31*a^5*tan(c + d*x)
^2)/96 + (a^5*tan(c + d*x)^3*5i)/32 + (a^5*tan(c + d*x)^4)/32)/(d*(5*tan(c
+ d*x) - tan(c + d*x)^2*10i - 10*tan(c + d*x)^3 + tan(c + d*x)^4*5i + tan(c
 + d*x)^5 + 1i))
```

sympy [A] time = 0.73, size = 211, normalized size = 1.47

$$\frac{a^5x}{32}+\begin{cases}-\frac{100663296ia^5d^4e^{10ic}e^{10idx}+629145600ia^5d^4e^{8ic}e^{8idx}+1677721600ia^5d^4e^{6ic}e^{6idx}+2516582400ia^5d^4e^{4ic}e^{4idx}+2516582400ia^5d^4e^{2ic}e^{2idx}}{32212254720d^5} & \text{fo} \\ x\left(\frac{a^5e^{10ic}}{32}+\frac{5a^5e^{8ic}}{32}+\frac{5a^5e^{6ic}}{16}+\frac{5a^5e^{4ic}}{16}+\frac{5a^5e^{2ic}}{32}\right) & \text{o} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**10*(a+I*a*tan(d*x+c))**5,x)
```

```
[Out] a**5*x/32 + Piecewise((-(100663296*I*a**5*d**4*exp(10*I*c)*exp(10*I*d*x) +
629145600*I*a**5*d**4*exp(8*I*c)*exp(8*I*d*x) + 1677721600*I*a**5*d**4*exp(
6*I*c)*exp(6*I*d*x) + 2516582400*I*a**5*d**4*exp(4*I*c)*exp(4*I*d*x) + 2516
582400*I*a**5*d**4*exp(2*I*c)*exp(2*I*d*x))/(32212254720*d**5), Ne(32212254
720*d**5, 0)), (x*(a**5*exp(10*I*c)/32 + 5*a**5*exp(8*I*c)/32 + 5*a**5*exp(
6*I*c)/16 + 5*a**5*exp(4*I*c)/16 + 5*a**5*exp(2*I*c)/32), True))
```

3.69 $\int \cos^{12}(c+dx)(a+ia\tan(c+dx))^5\,dx$

Optimal. Leaf size=198

$$-\frac{ia^{11}}{24d(a-ia\tan(c+dx))^6}-\frac{ia^{10}}{20d(a-ia\tan(c+dx))^5}-\frac{3ia^9}{64d(a-ia\tan(c+dx))^4}-\frac{ia^8}{24d(a-ia\tan(c+dx))^3}-\frac{128}{}$$

```
[Out] 7/128*a^5*x-1/24*I*a^11/d/(a-I*a*tan(d*x+c))^6-1/20*I*a^10/d/(a-I*a*tan(d*x
+c))^5-3/64*I*a^9/d/(a-I*a*tan(d*x+c))^4-1/24*I*a^8/d/(a-I*a*tan(d*x+c))^3-
5/128*I*a^7/d/(a-I*a*tan(d*x+c))^2-3/64*I*a^6/d/(a-I*a*tan(d*x+c))+1/128*I*
a^6/d/(a+I*a*tan(d*x+c))
```

Rubi [A] time = 0.11, antiderivative size = 198, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {3487, 44, 206}

$$-\frac{ia^{11}}{24d(a-ia\tan(c+dx))^6}-\frac{ia^{10}}{20d(a-ia\tan(c+dx))^5}-\frac{3ia^9}{64d(a-ia\tan(c+dx))^4}-\frac{ia^8}{24d(a-ia\tan(c+dx))^3}-\frac{128}{}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^12*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (7*a^5*x)/128 - ((I/24)*a^11)/(d*(a - I*a*Tan[c + d*x])^6) - ((I/20)*a^10)/
(d*(a - I*a*Tan[c + d*x])^5) - (((3*I)/64)*a^9)/(d*(a - I*a*Tan[c + d*x])^4
) - ((I/24)*a^8)/(d*(a - I*a*Tan[c + d*x])^3) - (((5*I)/128)*a^7)/(d*(a - I
*a*Tan[c + d*x])^2) - (((3*I)/64)*a^6)/(d*(a - I*a*Tan[c + d*x])) + ((I/128
)*a^6)/(d*(a + I*a*Tan[c + d*x]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 206

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^{12}(c+dx)(a+ia\tan(c+dx))^5\,dx = -\frac{(ia^{13})\,\text{Subst}\left(\int \frac{1}{(a-x)^7(a+x)^2}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{(ia^{13})\,\text{Subst}\left(\int \left(\frac{1}{4a^2(a-x)^7} + \frac{1}{4a^3(a-x)^6} + \frac{3}{16a^4(a-x)^5} + \frac{1}{8a^5(a-x)^4} + \frac{5}{64a^6(a-x}\right.\right.}{d}$$

$$= -\frac{ia^{11}}{24d(a-ia\tan(c+dx))^6} - \frac{ia^{10}}{20d(a-ia\tan(c+dx))^5} - \frac{3ia^9}{64d(a-ia\tan}$$

$$= \frac{7a^5x}{128} - \frac{ia^{11}}{24d(a-ia\tan(c+dx))^6} - \frac{ia^{10}}{20d(a-ia\tan(c+dx))^5} - \frac{}{64d(a-}$$

Mathematica [A] time = 3.13, size = 159, normalized size = 0.80

$$\frac{a^5(-350\sin(c+dx) - 945\sin(3(c+dx)) - 840idx\sin(5(c+dx)) + 84\sin(5(c+dx)) + 70\sin(7(c+dx)) - 1750i}{15}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^12*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (a^5*((-1750*I)*Cos[c + d*x] - (1575*I)*Cos[3*(c + d*x)] - (84*I)*Cos[5*(c
+ d*x)] + 840*d*x*Cos[5*(c + d*x)] + (50*I)*Cos[7*(c + d*x)] - 350*Sin[c +
d*x] - 945*Sin[3*(c + d*x)] + 84*Sin[5*(c + d*x)] - (840*I)*d*x*Sin[5*(c +
d*x)] + 70*Sin[7*(c + d*x)])*(Cos[5*(c + 2*d*x)] + I*Sin[5*(c + 2*d*x)]))/(
15360*d*(Cos[d*x] + I*Sin[d*x])^5)
```

fricas [A] time = 0.62, size = 120, normalized size = 0.61

$$\frac{\left(840\,a^5dxe^{(2i\,dx+2i\,c)} - 10i\,a^5e^{(14i\,dx+14i\,c)} - 84i\,a^5e^{(12i\,dx+12i\,c)} - 315i\,a^5e^{(10i\,dx+10i\,c)} - 700i\,a^5e^{(8i\,dx+8i\,c)} - 1050i\,a^5e^{(6i}\right.}{15360\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^12*(a+I*a*tan(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/15360*(840*a^5*d*x*e^(2*I*d*x + 2*I*c) - 10*I*a^5*e^(14*I*d*x + 14*I*c) -
 84*I*a^5*e^(12*I*d*x + 12*I*c) - 315*I*a^5*e^(10*I*d*x + 10*I*c) - 700*I*a
^5*e^(8*I*d*x + 8*I*c) - 1050*I*a^5*e^(6*I*d*x + 6*I*c) - 1260*I*a^5*e^(4*I
*d*x + 4*I*c) + 60*I*a^5)*e^(-2*I*d*x - 2*I*c)/d
```

giac [B] time = 7.74, size = 914, normalized size = 4.62

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^12*(a+I*a*tan(d*x+c))^5,x, algorithm="giac")
```

```
[Out] 1/245760*(13440*a^5*d*x*e^(18*I*d*x + 10*I*c) + 107520*a^5*d*x*e^(16*I*d*x
+ 8*I*c) + 376320*a^5*d*x*e^(14*I*d*x + 6*I*c) + 752640*a^5*d*x*e^(12*I*d*x
 + 4*I*c) + 940800*a^5*d*x*e^(10*I*d*x + 2*I*c) + 376320*a^5*d*x*e^(6*I*d*x
 - 2*I*c) + 107520*a^5*d*x*e^(4*I*d*x - 4*I*c) + 13440*a^5*d*x*e^(2*I*d*x -
 6*I*c) + 752640*a^5*d*x*e^(8*I*d*x) - 4710*I*a^5*e^(18*I*d*x + 10*I*c)*log
(e^(2*I*d*x + 2*I*c) + 1) - 37680*I*a^5*e^(16*I*d*x + 8*I*c)*log(e^(2*I*d*x
 + 2*I*c) + 1) - 131880*I*a^5*e^(14*I*d*x + 6*I*c)*log(e^(2*I*d*x + 2*I*c)
+ 1) - 263760*I*a^5*e^(12*I*d*x + 4*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 329
700*I*a^5*e^(10*I*d*x + 2*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 131880*I*a^5*
```

```
e^(6*I*d*x - 2*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 37680*I*a^5*e^(4*I*d*x -
 4*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 4710*I*a^5*e^(2*I*d*x - 6*I*c)*log(e
^(2*I*d*x + 2*I*c) + 1) - 263760*I*a^5*e^(8*I*d*x)*log(e^(2*I*d*x + 2*I*c)
+ 1) + 4710*I*a^5*e^(18*I*d*x + 10*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 376
80*I*a^5*e^(16*I*d*x + 8*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 131880*I*a^5*
e^(14*I*d*x + 6*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 263760*I*a^5*e^(12*I*d
*x + 4*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 329700*I*a^5*e^(10*I*d*x + 2*I*
c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 131880*I*a^5*e^(6*I*d*x - 2*I*c)*log(e^(
2*I*d*x) + e^(-2*I*c)) + 37680*I*a^5*e^(4*I*d*x - 4*I*c)*log(e^(2*I*d*x) +
e^(-2*I*c)) + 4710*I*a^5*e^(2*I*d*x - 6*I*c)*log(e^(2*I*d*x) + e^(-2*I*c))
+ 263760*I*a^5*e^(8*I*d*x)*log(e^(2*I*d*x) + e^(-2*I*c)) - 160*I*a^5*e^(30*
I*d*x + 22*I*c) - 2624*I*a^5*e^(28*I*d*x + 20*I*c) - 20272*I*a^5*e^(26*I*d*
x + 18*I*c) - 98112*I*a^5*e^(24*I*d*x + 16*I*c) - 333984*I*a^5*e^(22*I*d*x
+ 14*I*c) - 853440*I*a^5*e^(20*I*d*x + 12*I*c) - 1691424*I*a^5*e^(18*I*d*x
+ 10*I*c) - 2609472*I*a^5*e^(16*I*d*x + 8*I*c) - 3076512*I*a^5*e^(14*I*d*x
+ 6*I*c) - 2680384*I*a^5*e^(12*I*d*x + 4*I*c) - 1640240*I*a^5*e^(10*I*d*x +
 2*I*c) - 124320*I*a^5*e^(6*I*d*x - 2*I*c) + 6720*I*a^5*e^(4*I*d*x - 4*I*c)
 + 7680*I*a^5*e^(2*I*d*x - 6*I*c) - 642880*I*a^5*e^(8*I*d*x) + 960*I*a^5*e^
(-8*I*c))/(d*e^(18*I*d*x + 10*I*c) + 8*d*e^(16*I*d*x + 8*I*c) + 28*d*e^(14*
I*d*x + 6*I*c) + 56*d*e^(12*I*d*x + 4*I*c) + 70*d*e^(10*I*d*x + 2*I*c) + 28
*d*e^(6*I*d*x - 2*I*c) + 8*d*e^(4*I*d*x - 4*I*c) + d*e^(2*I*d*x - 6*I*c) +
56*d*e^(8*I*d*x))
```

maple [B] time = 0.63, size = 361, normalized size = 1.82

$$\frac{ia^5\left(-\frac{\left(\sin^4(dx+c)\right)\left(\cos^8(dx+c)\right)}{12}-\frac{\left(\sin^2(dx+c)\right)\left(\cos^8(dx+c)\right)}{30}-\frac{\left(\cos^8(dx+c)\right)}{120}\right)+5a^5\left(-\frac{\left(\sin^3(dx+c)\right)\left(\cos^9(dx+c)\right)}{12}-\frac{\sin(dx+c)\left(\cos^9(dx+\right.}{40}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^12*(a+I*a*tan(d*x+c))^5,x)
```

```
[Out] 1/d*(I*a^5*(-1/12*sin(d*x+c)^4*cos(d*x+c)^8-1/30*sin(d*x+c)^2*cos(d*x+c)^8-
1/120*cos(d*x+c)^8)+5*a^5*(-1/12*sin(d*x+c)^3*cos(d*x+c)^9-1/40*sin(d*x+c)*
cos(d*x+c)^9+1/320*(cos(d*x+c)^7+7/6*cos(d*x+c)^5+35/24*cos(d*x+c)^3+35/16*
cos(d*x+c))*sin(d*x+c)+7/1024*d*x+7/1024*c)-10*I*a^5*(-1/12*sin(d*x+c)^2*co
s(d*x+c)^10-1/60*cos(d*x+c)^10)-10*a^5*(-1/12*sin(d*x+c)*cos(d*x+c)^11+1/12
0*(cos(d*x+c)^9+9/8*cos(d*x+c)^7+21/16*cos(d*x+c)^5+105/64*cos(d*x+c)^3+315
/128*cos(d*x+c))*sin(d*x+c)+21/1024*d*x+21/1024*c)-5/12*I*a^5*cos(d*x+c)^12
+a^5*(1/12*(cos(d*x+c)^11+11/10*cos(d*x+c)^9+99/80*cos(d*x+c)^7+231/160*cos
(d*x+c)^5+231/128*cos(d*x+c)^3+693/256*cos(d*x+c))*sin(d*x+c)+231/1024*d*x+
231/1024*c))
```

maxima [A] time = 0.54, size = 187, normalized size = 0.94

$$\frac{840\,(dx+c)a^5+\frac{840\,a^5\tan(dx+c)^{11}+4760\,a^5\tan(dx+c)^9+11088\,a^5\tan(dx+c)^7+13488\,a^5\tan(dx+c)^5-1920i\,a^5\tan(dx+c)^4+360\,a^5\tan(dx+c)}{\tan(dx+c)^{12}+6\,\tan(dx+c)^{10}+15\,\tan(dx+c)^8+20\,\tan(dx+c)^6+15\,\tan(dx+c)^4+6\,\mathrm{ta}}}{15360\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^12*(a+I*a*tan(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] 1/15360*(840*(d*x + c)*a^5 + (840*a^5*tan(d*x + c)^11 + 4760*a^5*tan(d*x +
c)^9 + 11088*a^5*tan(d*x + c)^7 + 13488*a^5*tan(d*x + c)^5 - 1920*I*a^5*tan
(d*x + c)^4 + 360*a^5*tan(d*x + c)^3 + 14592*I*a^5*tan(d*x + c)^2 + 14520*a
^5*tan(d*x + c) - 3968*I*a^5)/(tan(d*x + c)^12 + 6*tan(d*x + c)^10 + 15*tan
(d*x + c)^8 + 20*tan(d*x + c)^6 + 15*tan(d*x + c)^4 + 6*tan(d*x + c)^2 + 1)
)/d
```

mupad [B] time = 4.90, size = 171, normalized size = 0.86

$$\frac{7\,a^5\,x}{128}-\frac{-\frac{7\,a^5\,\tan(c+d\,x)^6}{128}-\frac{a^5\,\tan(c+d\,x)^5\,35\mathrm{i}}{128}+\frac{49\,a^5\,\tan(c+d\,x)^4}{96}+\frac{a^5\,\tan(c+d\,x)^3\,35\mathrm{i}}{96}+\frac{63\,a^5\,\tan(c+d\,x)^2}{640}+\frac{a^5\,\tan(c+d\,x)}{384}}{d\,\left(\tan\left(c+d\,x\right)^7+\tan\left(c+d\,x\right)^6\,5\mathrm{i}-9\,\tan\left(c+d\,x\right)^5-\tan\left(c+d\,x\right)^4\,5\mathrm{i}-5\,\tan\left(c+d\,x\right)^3-\tan\left(c+d\,x\right)^2\,9\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^12*(a + a*tan(c + d*x)*1i)^5,x)
```

```
[Out] (7*a^5*x)/128 - ((a^5*tan(c + d*x)*133i)/384 - (31*a^5)/120 + (63*a^5*tan(c
 + d*x)^2)/640 + (a^5*tan(c + d*x)^3*35i)/96 + (49*a^5*tan(c + d*x)^4)/96 -
 (a^5*tan(c + d*x)^5*35i)/128 - (7*a^5*tan(c + d*x)^6)/128)/(d*(5*tan(c + d
*x) - tan(c + d*x)^2*9i - 5*tan(c + d*x)^3 - tan(c + d*x)^4*5i - 9*tan(c +
d*x)^5 + tan(c + d*x)^6*5i + tan(c + d*x)^7 + 1i))
```

sympy [A] time = 0.94, size = 304, normalized size = 1.54

$$\frac{7a^5x}{128}+\begin{cases}-\frac{\left(33776997205278720ia^5d^6e^{14ic}e^{12idx}+283726776524341248ia^5d^6e^{12ic}e^{10idx}+1063975411966279680ia^5d^6e^{10ic}e^{8idx}+23643898043695104\ldots\right.}{51881467707308\ldots} \\ x\left(-\frac{7a^5}{128}+\frac{\left(a^5e^{14ic}+7a^5e^{12ic}+21a^5e^{10ic}+35a^5e^{8ic}+35a^5e^{6ic}+21a^5e^{4ic}+7a^5e^{2ic}+a^5\right)e^{-2ic}}{128}\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**12*(a+I*a*tan(d*x+c))**5,x)
```

```
[Out] 7*a**5*x/128 + Piecewise((-(33776997205278720*I*a**5*d**6*exp(14*I*c)*exp(1
2*I*d*x) + 283726776524341248*I*a**5*d**6*exp(12*I*c)*exp(10*I*d*x) + 10639
75411966279680*I*a**5*d**6*exp(10*I*c)*exp(8*I*d*x) + 2364389804369510400*I
*a**5*d**6*exp(8*I*c)*exp(6*I*d*x) + 3546584706554265600*I*a**5*d**6*exp(6*
I*c)*exp(4*I*d*x) + 4255901647865118720*I*a**5*d**6*exp(4*I*c)*exp(2*I*d*x)
 - 202661983231672320*I*a**5*d**6*exp(-2*I*d*x))*exp(-2*I*c)/(5188146770730
8113920*d**7), Ne(51881467707308113920*d**7*exp(2*I*c), 0)), (x*(-7*a**5/12
8 + (a**5*exp(14*I*c) + 7*a**5*exp(12*I*c) + 21*a**5*exp(10*I*c) + 35*a**5*
exp(8*I*c) + 35*a**5*exp(6*I*c) + 21*a**5*exp(4*I*c) + 7*a**5*exp(2*I*c) +
a**5)*exp(-2*I*c)/128), True))
```

3.70 $\int \sec(c+dx)(a+ia\tan(c+dx))^5\,dx$

Optimal. Leaf size=167

$$\frac{63ia^5\sec(c+dx)}{8d}+\frac{63a^5\tanh^{-1}(\sin(c+dx))}{8d}+\frac{21i\sec(c+dx)\left(a^5+ia^5\tan(c+dx)\right)}{8d}+\frac{9ia^2\sec(c+dx)(a+ia\tan(c+dx))^3}{20d}$$

```
[Out] 63/8*a^5*arctanh(sin(d*x+c))/d+63/8*I*a^5*sec(d*x+c)/d+9/20*I*a^2*sec(d*x+c
)*(a+I*a*tan(d*x+c))^3/d+1/5*I*a*sec(d*x+c)*(a+I*a*tan(d*x+c))^4/d+21/20*I*
a*sec(d*x+c)*(a^2+I*a^2*tan(d*x+c))^2/d+21/8*I*sec(d*x+c)*(a^5+I*a^5*tan(d*
x+c))/d
```

Rubi [A] time = 0.13, antiderivative size = 167, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {3498, 3486, 3770}

$$\frac{63ia^5\sec(c+dx)}{8d}+\frac{63a^5\tanh^{-1}(\sin(c+dx))}{8d}+\frac{9ia^2\sec(c+dx)(a+ia\tan(c+dx))^3}{20d}+\frac{21ia\sec(c+dx)\left(a^2+ia^2\right.}{20d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (63*a^5*ArcTanh[Sin[c + d*x]])/(8*d) + (((63*I)/8)*a^5*Sec[c + d*x])/d + ((
(9*I)/20)*a^2*Sec[c + d*x]*(a + I*a*Tan[c + d*x])^3)/d + ((I/5)*a*Sec[c + d
*x]*(a + I*a*Tan[c + d*x])^4)/d + (((21*I)/20)*a*Sec[c + d*x]*(a^2 + I*a^2*
Tan[c + d*x])^2)/d + (((21*I)/8)*Sec[c + d*x]*(a^5 + I*a^5*Tan[c + d*x]))/d
```

Rule 3486

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

Rule 3498

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \sec(c+dx)(a+ia\tan(c+dx))^5\,dx = \frac{ia\sec(c+dx)(a+ia\tan(c+dx))^4}{5d} + \frac{1}{5}(9a)\int \sec(c+dx)(a+ia\tan(c+$$
$$= \frac{9ia^2\sec(c+dx)(a+ia\tan(c+dx))^3}{20d} + \frac{ia\sec(c+dx)(a+ia\tan(c+dx)}{5d}$$
$$= \frac{21ia^3\sec(c+dx)(a+ia\tan(c+dx))^2}{20d} + \frac{9ia^2\sec(c+dx)(a+ia\tan(c+}{20d}$$
$$= \frac{21ia^3\sec(c+dx)(a+ia\tan(c+dx))^2}{20d} + \frac{9ia^2\sec(c+dx)(a+ia\tan(c+}{20d}$$
$$= \frac{63ia^5\sec(c+dx)}{8d} + \frac{21ia^3\sec(c+dx)(a+ia\tan(c+dx))^2}{20d} + \frac{9ia^2\sec(c}{}$$
$$= \frac{63a^5\tanh^{-1}(\sin(c+dx))}{8d} + \frac{63ia^5\sec(c+dx)}{8d} + \frac{21ia^3\sec(c+dx)(a+ia}{20d}$$

Mathematica [A] time = 1.28, size = 115, normalized size = 0.69

$$\frac{a^5(\cos(5dx)+i\sin(5dx))\left(5040\tanh^{-1}\left(\cos(c)\tan\left(\frac{dx}{2}\right)+\sin(c)\right)+i\sec^5(c+dx)(450i\sin(2(c+dx))+325i\sin}{320d(\cos(dx)+i\sin(dx))^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (a^5*(Cos[5*d*x] + I*Sin[5*d*x])*(5040*ArcTanh[Sin[c] + Cos[c]*Tan[(d*x)/2]
] + I*Sec[c + d*x]^5*(1344 + 1920*Cos[2*(c + d*x)] + 640*Cos[4*(c + d*x)] +
 (450*I)*Sin[2*(c + d*x)] + (325*I)*Sin[4*(c + d*x)])))/(320*d*(Cos[d*x] +
I*Sin[d*x])^5)
```

fricas [B] time = 0.52, size = 310, normalized size = 1.86

$$\frac{1930i\,a^5e^{(9i\,dx+9i\,c)}+4740i\,a^5e^{(7i\,dx+7i\,c)}+5376i\,a^5e^{(5i\,dx+5i\,c)}+2940i\,a^5e^{(3i\,dx+3i\,c)}+630i\,a^5e^{(i\,dx+i\,c)}+315\left(a^5e^{(10i\,dx}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/40*(1930*I*a^5*e^(9*I*d*x + 9*I*c) + 4740*I*a^5*e^(7*I*d*x + 7*I*c) + 537
6*I*a^5*e^(5*I*d*x + 5*I*c) + 2940*I*a^5*e^(3*I*d*x + 3*I*c) + 630*I*a^5*e^
(I*d*x + I*c) + 315*(a^5*e^(10*I*d*x + 10*I*c) + 5*a^5*e^(8*I*d*x + 8*I*c)
+ 10*a^5*e^(6*I*d*x + 6*I*c) + 10*a^5*e^(4*I*d*x + 4*I*c) + 5*a^5*e^(2*I*d*
x + 2*I*c) + a^5)*log(e^(I*d*x + I*c) + I) - 315*(a^5*e^(10*I*d*x + 10*I*c)
 + 5*a^5*e^(8*I*d*x + 8*I*c) + 10*a^5*e^(6*I*d*x + 6*I*c) + 10*a^5*e^(4*I*d
*x + 4*I*c) + 5*a^5*e^(2*I*d*x + 2*I*c) + a^5)*log(e^(I*d*x + I*c) - I))/(d
*e^(10*I*d*x + 10*I*c) + 5*d*e^(8*I*d*x + 8*I*c) + 10*d*e^(6*I*d*x + 6*I*c)
 + 10*d*e^(4*I*d*x + 4*I*c) + 5*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [A] time = 2.09, size = 189, normalized size = 1.13

$$\frac{315\,a^5\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)-315\,a^5\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)-\frac{2\left(275\,a^5\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^9+200i\,a^5\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^8-750\,a}{}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^5,x, algorithm="giac")
```

```
[Out] 1/40*(315*a^5*log(tan(1/2*d*x + 1/2*c) + 1) - 315*a^5*log(tan(1/2*d*x + 1/2
*c) - 1) - 2*(275*a^5*tan(1/2*d*x + 1/2*c)^9 + 200*I*a^5*tan(1/2*d*x + 1/2*
c)^8 - 750*a^5*tan(1/2*d*x + 1/2*c)^7 - 1600*I*a^5*tan(1/2*d*x + 1/2*c)^6 +
 3280*I*a^5*tan(1/2*d*x + 1/2*c)^4 + 750*a^5*tan(1/2*d*x + 1/2*c)^3 - 2240*
I*a^5*tan(1/2*d*x + 1/2*c)^2 - 275*a^5*tan(1/2*d*x + 1/2*c) + 488*I*a^5)/(t
an(1/2*d*x + 1/2*c)^2 - 1)^5)/d
```

maple [B] time = 0.34, size = 329, normalized size = 1.97

$$-\frac{ia^5\left(\sin^6(dx+c)\right)}{15d\cos(dx+c)^3}-\frac{10ia^5\left(\sin^4(dx+c)\right)}{3d\cos(dx+c)^3}+\frac{18ia^5\cos(dx+c)\left(\sin^2(dx+c)\right)}{5d}+\frac{ia^5\left(\sin^6(dx+c)\right)}{5d\cos(dx+c)^5}+\frac{5ia^5}{d\cos(dx+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)*(a+I*a*tan(d*x+c))^5,x)
```

```
[Out] -1/15*I/d*a^5*sin(d*x+c)^6/cos(d*x+c)^3-10/3*I/d*a^5*sin(d*x+c)^4/cos(d*x+c
)^3+18/5*I/d*a^5*cos(d*x+c)*sin(d*x+c)^2+1/5*I/d*a^5*sin(d*x+c)^6/cos(d*x+c
)^5+5*I/d*a^5/cos(d*x+c)+1/5*I/d*a^5*sin(d*x+c)^6/cos(d*x+c)+5/4/d*a^5*sin(
d*x+c)^5/cos(d*x+c)^4-5/8/d*a^5*sin(d*x+c)^5/cos(d*x+c)^2-5/8*a^5*sin(d*x+c
)^3/d-55/8*a^5*sin(d*x+c)/d+63/8/d*a^5*ln(sec(d*x+c)+tan(d*x+c))+36/5*I/d*a
^5*cos(d*x+c)+10/3*I/d*a^5*sin(d*x+c)^4/cos(d*x+c)+1/5*I/d*a^5*cos(d*x+c)*s
in(d*x+c)^4-5/d*a^5*sin(d*x+c)^3/cos(d*x+c)^2
```

maxima [A] time = 0.76, size = 215, normalized size = 1.29

$$75\,a^5\left(\frac{2\left(5\,\sin(dx+c)^3-3\,\sin(dx+c)\right)}{\sin(dx+c)^4-2\,\sin(dx+c)^2+1}+3\,\log\left(\sin\left(dx+c\right)+1\right)-3\,\log\left(\sin\left(dx+c\right)-1\right)\right)+600\,a^5\left(\frac{2\,\sin(dx+c)}{\sin(dx+c)^2-1}+\log($$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] 1/240*(75*a^5*(2*(5*sin(d*x + c)^3 - 3*sin(d*x + c))/(sin(d*x + c)^4 - 2*si
n(d*x + c)^2 + 1) + 3*log(sin(d*x + c) + 1) - 3*log(sin(d*x + c) - 1)) + 60
0*a^5*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) + log(sin(d*x + c) + 1) - log(si
n(d*x + c) - 1)) + 240*a^5*log(sec(d*x + c) + tan(d*x + c)) + 1200*I*a^5/co
s(d*x + c) + 800*I*(3*cos(d*x + c)^2 - 1)*a^5/cos(d*x + c)^3 + 16*I*(15*cos
(d*x + c)^4 - 10*cos(d*x + c)^2 + 3)*a^5/cos(d*x + c)^5)/d
```

mupad [B] time = 7.04, size = 228, normalized size = 1.37

$$\frac{63\,a^5\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{4\,d}-\frac{\frac{55\,a^5\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9}{4}+a^5\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8\,10\mathrm{i}-\frac{75\,a^5\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{2}-a^5\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6\,80\mathrm{i}+a}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}-5\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8+10\,\tan\left(\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^5/cos(c + d*x),x)
```

```
[Out] (63*a^5*atanh(tan(c/2 + (d*x)/2)))/(4*d) - ((75*a^5*tan(c/2 + (d*x)/2)^3)/2
 - a^5*tan(c/2 + (d*x)/2)^2*112i + a^5*tan(c/2 + (d*x)/2)^4*164i - a^5*tan(
c/2 + (d*x)/2)^6*80i - (75*a^5*tan(c/2 + (d*x)/2)^7)/2 + a^5*tan(c/2 + (d*x
)/2)^8*10i + (55*a^5*tan(c/2 + (d*x)/2)^9)/4 + (a^5*122i)/5 - (55*a^5*tan(c
/2 + (d*x)/2))/4)/(d*(5*tan(c/2 + (d*x)/2)^2 - 10*tan(c/2 + (d*x)/2)^4 + 10
*tan(c/2 + (d*x)/2)^6 - 5*tan(c/2 + (d*x)/2)^8 + tan(c/2 + (d*x)/2)^10 - 1)
)
```

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

$$ia^5\left(\int(-i\sec(c+dx))\,dx+\int 5\tan(c+dx)\sec(c+dx)\,dx+\int\left(-10\tan^3(c+dx)\sec(c+dx)\right)dx+\int\tan^5(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))**5,x)
```

```
[Out] I*a**5*(Integral(-I*sec(c + d*x), x) + Integral(5*tan(c + d*x)*sec(c + d*x)
, x) + Integral(-10*tan(c + d*x)**3*sec(c + d*x), x) + Integral(tan(c + d*x
)**5*sec(c + d*x), x) + Integral(10*I*tan(c + d*x)**2*sec(c + d*x), x) + In
tegral(-5*I*tan(c + d*x)**4*sec(c + d*x), x))
```

3.71 $\int \cos(c+dx)(a+ia\tan(c+dx))^5\,dx$

Optimal. Leaf size=130

$$-\frac{35ia^5\sec(c+dx)}{2d}-\frac{35a^5\tanh^{-1}(\sin(c+dx))}{2d}-\frac{35i\sec(c+dx)\left(a^5+ia^5\tan(c+dx)\right)}{6d}-\frac{7ia^3\sec(c+dx)(a+ia}{3d}$$

```
[Out] -35/2*a^5*arctanh(sin(d*x+c))/d-35/2*I*a^5*sec(d*x+c)/d-7/3*I*a^3*sec(d*x+c
)*(a+I*a*tan(d*x+c))^2/d-2*I*a*cos(d*x+c)*(a+I*a*tan(d*x+c))^4/d-35/6*I*sec
(d*x+c)*(a^5+I*a^5*tan(d*x+c))/d
```

Rubi [A] time = 0.10, antiderivative size = 130, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {3496, 3498, 3486, 3770}

$$-\frac{35ia^5\sec(c+dx)}{2d}-\frac{35a^5\tanh^{-1}(\sin(c+dx))}{2d}-\frac{7ia^3\sec(c+dx)(a+ia\tan(c+dx))^2}{3d}-\frac{35i\sec(c+dx)\left(a^5+ia^5\right.}{6d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (-35*a^5*ArcTanh[Sin[c + d*x]])/(2*d) - (((35*I)/2)*a^5*Sec[c + d*x])/d - (
((7*I)/3)*a^3*Sec[c + d*x]*(a + I*a*Tan[c + d*x])^2)/d - ((2*I)*a*Cos[c + d
*x]*(a + I*a*Tan[c + d*x])^4)/d - (((35*I)/6)*Sec[c + d*x]*(a^5 + I*a^5*Tan
[c + d*x]))/d
```

Rule 3486

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

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3498

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \cos(c+dx)(a+ia\tan(c+dx))^5\,dx = -\frac{2ia\cos(c+dx)(a+ia\tan(c+dx))^4}{d} - \left(7a^2\right)\int \sec(c+dx)(a+ia\tan($$
$$= -\frac{7ia^3\sec(c+dx)(a+ia\tan(c+dx))^2}{3d} - \frac{2ia\cos(c+dx)(a+ia\tan(c+}{d}$$
$$= -\frac{7ia^3\sec(c+dx)(a+ia\tan(c+dx))^2}{3d} - \frac{2ia\cos(c+dx)(a+ia\tan(c+}{d}$$
$$= -\frac{35ia^5\sec(c+dx)}{2d} - \frac{7ia^3\sec(c+dx)(a+ia\tan(c+dx))^2}{3d} - \frac{2ia\cos(c+}{}$$
$$= -\frac{35a^5\tanh^{-1}(\sin(c+dx))}{2d} - \frac{35ia^5\sec(c+dx)}{2d} - \frac{7ia^3\sec(c+dx)(a+i}{3d}$$

Mathematica [A] time = 1.69, size = 151, normalized size = 1.16

$$\frac{a^5\cos^2(c+dx)(\tan(c+dx)-i)^5\Big((\cos(4c-dx)-i\sin(4c-dx))(-i(49\sin(c+dx)+57\sin(3(c+dx)))+511\cos}{24d(\cos(dx)+i}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (a^5*Cos[c + d*x]^2*((-840*I)*ArcTanh[Sin[c] + Cos[c]*Tan[(d*x)/2]]*Cos[c +
 d*x]^3*(Cos[5*c] - I*Sin[5*c]) + (Cos[4*c - d*x] - I*Sin[4*c - d*x])*(511*
Cos[c + d*x] + 153*Cos[3*(c + d*x)] - I*(49*Sin[c + d*x] + 57*Sin[3*(c + d*
x)])))*(-I + Tan[c + d*x])^5)/(24*d*(Cos[d*x] + I*Sin[d*x])^5)
```

fricas [A] time = 0.63, size = 216, normalized size = 1.66

$$\frac{-96i\,a^5e^{(7i\,dx+7i\,c)} - 462i\,a^5e^{(5i\,dx+5i\,c)} - 560i\,a^5e^{(3i\,dx+3i\,c)} - 210i\,a^5e^{(i\,dx+i\,c)} - 105\left(a^5e^{(6i\,dx+6i\,c)} + 3\,a^5e^{(4i\,dx+4i\,c)} + 3\right.}{6\left(de^{(6i\,dx+6i\,c)} + 3\,de^{(4i\,dx+}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/6*(-96*I*a^5*e^(7*I*d*x + 7*I*c) - 462*I*a^5*e^(5*I*d*x + 5*I*c) - 560*I*
a^5*e^(3*I*d*x + 3*I*c) - 210*I*a^5*e^(I*d*x + I*c) - 105*(a^5*e^(6*I*d*x +
 6*I*c) + 3*a^5*e^(4*I*d*x + 4*I*c) + 3*a^5*e^(2*I*d*x + 2*I*c) + a^5)*log(
e^(I*d*x + I*c) + I) + 105*(a^5*e^(6*I*d*x + 6*I*c) + 3*a^5*e^(4*I*d*x + 4*
I*c) + 3*a^5*e^(2*I*d*x + 2*I*c) + a^5)*log(e^(I*d*x + I*c) - I))/(d*e^(6*I
*d*x + 6*I*c) + 3*d*e^(4*I*d*x + 4*I*c) + 3*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [B] time = 3.49, size = 510, normalized size = 3.92

$$\frac{8295\,a^5e^{(6i\,dx+6i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}+1\right) + 24885\,a^5e^{(4i\,dx+4i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}+1\right) + 24885\,a^5e^{(2i\,dx+2i\,c)}\log\left(i\,e^{(i\,dx+i\,c)}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^5,x, algorithm="giac")
```

```
[Out] 1/1536*(8295*a^5*e^(6*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*c) + 1) + 24885*a^5
*e^(4*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 24885*a^5*e^(2*I*d*x + 2*
I*c)*log(I*e^(I*d*x + I*c) + 1) - 18585*a^5*e^(6*I*d*x + 6*I*c)*log(I*e^(I*
d*x + I*c) - 1) - 55755*a^5*e^(4*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) - 1)
- 55755*a^5*e^(2*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) - 1) - 8295*a^5*e^(6*
```

```
I*d*x + 6*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 24885*a^5*e^(4*I*d*x + 4*I*c)*
log(-I*e^(I*d*x + I*c) + 1) - 24885*a^5*e^(2*I*d*x + 2*I*c)*log(-I*e^(I*d*x
 + I*c) + 1) + 18585*a^5*e^(6*I*d*x + 6*I*c)*log(-I*e^(I*d*x + I*c) - 1) +
55755*a^5*e^(4*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) - 1) + 55755*a^5*e^(2*
I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 24576*I*a^5*e^(7*I*d*x + 7*I*c
) - 118272*I*a^5*e^(5*I*d*x + 5*I*c) - 143360*I*a^5*e^(3*I*d*x + 3*I*c) - 5
3760*I*a^5*e^(I*d*x + I*c) + 8295*a^5*log(I*e^(I*d*x + I*c) + 1) - 18585*a^
5*log(I*e^(I*d*x + I*c) - 1) - 8295*a^5*log(-I*e^(I*d*x + I*c) + 1) + 18585
*a^5*log(-I*e^(I*d*x + I*c) - 1))/(d*e^(6*I*d*x + 6*I*c) + 3*d*e^(4*I*d*x +
 4*I*c) + 3*d*e^(2*I*d*x + 2*I*c) + d)
```

maple [A] time = 0.48, size = 214, normalized size = 1.65

$$\frac{ia^5\left(\sin^6(dx+c)\right)}{3d\cos(dx+c)^3}-\frac{34ia^5\cos(dx+c)\left(\sin^2(dx+c)\right)}{3d}-\frac{ia^5\left(\sin^6(dx+c)\right)}{d\cos(dx+c)}-\frac{ia^5\cos(dx+c)\left(\sin^4(dx+c)\right)}{d}-\frac{83 \cdots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)*(a+I*a*tan(d*x+c))^5,x)
```

```
[Out] 1/3*I/d*a^5*sin(d*x+c)^6/cos(d*x+c)^3-34/3*I/d*a^5*cos(d*x+c)*sin(d*x+c)^2-
I/d*a^5*sin(d*x+c)^6/cos(d*x+c)-I/d*a^5*cos(d*x+c)*sin(d*x+c)^4-83/3*I/d*a^
5*cos(d*x+c)+5/2/d*a^5*sin(d*x+c)^5/cos(d*x+c)^2+5/2*a^5*sin(d*x+c)^3/d+37/
2*a^5*sin(d*x+c)/d-35/2/d*a^5*ln(sec(d*x+c)+tan(d*x+c))-10*I/d*a^5*sin(d*x+
c)^4/cos(d*x+c)
```

maxima [A] time = 0.64, size = 173, normalized size = 1.33

$$-\frac{15\,a^5\left(\frac{2\,\sin(dx+c)}{\sin(dx+c)^2-1}+3\,\log(\sin(dx+c)+1)-3\,\log(\sin(dx+c)-1)-4\,\sin(dx+c)\right)+120i\,a^5\left(\frac{1}{\cos(dx+c)}+c \cdots\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] -1/12*(15*a^5*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) + 3*log(sin(d*x + c) + 1
) - 3*log(sin(d*x + c) - 1) - 4*sin(d*x + c)) + 120*I*a^5*(1/cos(d*x + c) +
 cos(d*x + c)) + 4*I*a^5*((6*cos(d*x + c)^2 - 1)/cos(d*x + c)^3 + 3*cos(d*x
 + c)) + 60*a^5*(log(sin(d*x + c) + 1) - log(sin(d*x + c) - 1) - 2*sin(d*x
+ c)) + 60*I*a^5*cos(d*x + c) - 12*a^5*sin(d*x + c))/d
```

mupad [B] time = 7.14, size = 222, normalized size = 1.71

$$-\frac{35\,a^5\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d}-\frac{37\,a^5\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6+a^5\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5\,27\mathrm{i}-118\,a^5\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-a^5\,\tan\left(\frac{c}{2}+ \cdots\right.}{d\,\left(-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6\,1\mathrm{i}+3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4\,3\mathrm{i}- \cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^5,x)
```

```
[Out] - (35*a^5*atanh(tan(c/2 + (d*x)/2)))/d - (139*a^5*tan(c/2 + (d*x)/2)^2 - a^
5*tan(c/2 + (d*x)/2)^3*48i - 118*a^5*tan(c/2 + (d*x)/2)^4 + a^5*tan(c/2 + (
d*x)/2)^5*27i + 37*a^5*tan(c/2 + (d*x)/2)^6 - (166*a^5)/3 + (a^5*tan(c/2 +
(d*x)/2)*55i)/3)/(d*(tan(c/2 + (d*x)/2) - tan(c/2 + (d*x)/2)^2*3i - 3*tan(c
/2 + (d*x)/2)^3 + tan(c/2 + (d*x)/2)^4*3i + 3*tan(c/2 + (d*x)/2)^5 - tan(c/
2 + (d*x)/2)^6*1i - tan(c/2 + (d*x)/2)^7 + 1i))
```

sympy [A] time = 0.54, size = 201, normalized size = 1.55

$$\frac{35a^5\left(\frac{\log\left(e^{idx}-ie^{-ic}\right)}{2}-\frac{\log\left(e^{idx}+ie^{-ic}\right)}{2}\right)}{d}+\frac{-87a^5e^{5ic}e^{5idx}-136a^5e^{3ic}e^{3idx}-57a^5e^{ic}e^{idx}}{-3ide^{6ic}e^{6idx}-9ide^{4ic}e^{4idx}-9ide^{2ic}e^{2idx}-3id}+\begin{cases}-\frac{16ia^5e^{ic}e^{idx}}{d} & \text{for } d\neq 0\\ 16a^5xe^{ic} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))**5,x)
```

```
[Out] 35*a**5*(log(exp(I*d*x) - I*exp(-I*c))/2 - log(exp(I*d*x) + I*exp(-I*c))/2)
/d + (-87*a**5*exp(5*I*c)*exp(5*I*d*x) - 136*a**5*exp(3*I*c)*exp(3*I*d*x) -
 57*a**5*exp(I*c)*exp(I*d*x))/(-3*I*d*exp(6*I*c)*exp(6*I*d*x) - 9*I*d*exp(4
*I*c)*exp(4*I*d*x) - 9*I*d*exp(2*I*c)*exp(2*I*d*x) - 3*I*d) + Piecewise((-1
6*I*a**5*exp(I*c)*exp(I*d*x)/d, Ne(d, 0)), (16*a**5*x*exp(I*c), True))
```

3.72 $\int \cos^3(c+dx)(a+ia\tan(c+dx))^5\,dx$

Optimal. Leaf size=98

$$\frac{5ia^5\sec(c+dx)}{d}+\frac{5a^5\tanh^{-1}(\sin(c+dx))}{d}+\frac{10ia^3\cos(c+dx)(a+ia\tan(c+dx))^2}{3d}-\frac{2ia\cos^3(c+dx)(a+ia\tan}{3d}$$

```
[Out] 5*a^5*arctanh(sin(d*x+c))/d+5*I*a^5*sec(d*x+c)/d+10/3*I*a^3*cos(d*x+c)*(a+I
*a*tan(d*x+c))^2/d-2/3*I*a*cos(d*x+c)^3*(a+I*a*tan(d*x+c))^4/d
```

Rubi [A] time = 0.09, antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3496, 3486, 3770}

$$\frac{5ia^5\sec(c+dx)}{d}+\frac{5a^5\tanh^{-1}(\sin(c+dx))}{d}+\frac{10ia^3\cos(c+dx)(a+ia\tan(c+dx))^2}{3d}-\frac{2ia\cos^3(c+dx)(a+ia\tan}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (5*a^5*ArcTanh[Sin[c + d*x]])/d + ((5*I)*a^5*Sec[c + d*x])/d + (((10*I)/3)*
a^3*Cos[c + d*x]*(a + I*a*Tan[c + d*x])^2)/d - (((2*I)/3)*a*Cos[c + d*x]^3*
(a + I*a*Tan[c + d*x])^4)/d
```

Rule 3486

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

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\int \cos^3(c+dx)(a+ia\tan(c+dx))^5\,dx &= -\frac{2ia\cos^3(c+dx)(a+ia\tan(c+dx))^4}{3d}-\frac{1}{3}\left(5a^2\right)\int \cos(c+dx)(a+\\
&= \frac{10ia^3\cos(c+dx)(a+ia\tan(c+dx))^2}{3d}-\frac{2ia\cos^3(c+dx)(a+ia\tan(}{3d}\\
&= \frac{5ia^5\sec(c+dx)}{d}+\frac{10ia^3\cos(c+dx)(a+ia\tan(c+dx))^2}{3d}-\frac{2ia\cos^3}{}\\
&= \frac{5a^5\tanh^{-1}(\sin(c+dx))}{d}+\frac{5ia^5\sec(c+dx)}{d}+\frac{10ia^3\cos(c+dx)(a+}{3d}
\end{aligned}$$

Mathematica [A] time = 1.88, size = 130, normalized size = 1.33

$$\frac{a^5\cos^4(c+dx)(\tan(c+dx)-i)^5\left(30(\sin(5c)+i\cos(5c))\cos(c+dx)\tanh^{-1}\left(\cos(c)\tan\left(\frac{dx}{2}\right)+\sin(c)\right)-(\cos(3c}{3d(\cos(dx)+i\sin(dx))^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (a^5*Cos[c + d*x]^4*(30*ArcTanh[Sin[c] + Cos[c]*Tan[(d*x)/2]]*Cos[c + d*x]*
(I*Cos[5*c] + Sin[5*c]) - (Cos[3*c - 2*d*x] - I*Sin[3*c - 2*d*x])*(10 + 13*
Cos[2*(c + d*x)] - (17*I)*Sin[2*(c + d*x)]))*(-I + Tan[c + d*x])^5)/(3*d*(C
os[d*x] + I*Sin[d*x])^5)
```

fricas [A] time = 0.49, size = 122, normalized size = 1.24

$$\frac{-4i\,a^5e^{(5i\,dx+5i\,c)}+20i\,a^5e^{(3i\,dx+3i\,c)}+30i\,a^5e^{(i\,dx+i\,c)}+15\left(a^5e^{(2i\,dx+2i\,c)}+a^5\right)\log\left(e^{(i\,dx+i\,c)}+i\right)-15\left(a^5e^{(2i\,dx+2i\,c)}+\right.}{3\left(de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/3*(-4*I*a^5*e^(5*I*d*x + 5*I*c) + 20*I*a^5*e^(3*I*d*x + 3*I*c) + 30*I*a^5
*e^(I*d*x + I*c) + 15*(a^5*e^(2*I*d*x + 2*I*c) + a^5)*log(e^(I*d*x + I*c) +
 I) - 15*(a^5*e^(2*I*d*x + 2*I*c) + a^5)*log(e^(I*d*x + I*c) - I))/(d*e^(2*
I*d*x + 2*I*c) + d)
```

giac [B] time = 3.23, size = 1683, normalized size = 17.17

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^5,x, algorithm="giac")
```

```
[Out] -1/6144*(39225*a^5*e^(16*I*d*x + 8*I*c)*log(I*e^(I*d*x + I*c) + 1) + 313800
*a^5*e^(14*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*c) + 1) + 1098300*a^5*e^(12*I*
d*x + 4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 2196600*a^5*e^(10*I*d*x + 2*I*c)*
log(I*e^(I*d*x + I*c) + 1) + 2196600*a^5*e^(6*I*d*x - 2*I*c)*log(I*e^(I*d*x
 + I*c) + 1) + 1098300*a^5*e^(4*I*d*x - 4*I*c)*log(I*e^(I*d*x + I*c) + 1) +
 313800*a^5*e^(2*I*d*x - 6*I*c)*log(I*e^(I*d*x + I*c) + 1) + 2745750*a^5*e^
(8*I*d*x)*log(I*e^(I*d*x + I*c) + 1) + 39225*a^5*e^(-8*I*c)*log(I*e^(I*d*x
+ I*c) + 1) + 8520*a^5*e^(16*I*d*x + 8*I*c)*log(I*e^(I*d*x + I*c) - 1) + 68
160*a^5*e^(14*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*c) - 1) + 238560*a^5*e^(12*
I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) - 1) + 477120*a^5*e^(10*I*d*x + 2*I*c)
*log(I*e^(I*d*x + I*c) - 1) + 477120*a^5*e^(6*I*d*x - 2*I*c)*log(I*e^(I*d*x
 + I*c) - 1) + 238560*a^5*e^(4*I*d*x - 4*I*c)*log(I*e^(I*d*x + I*c) - 1) +
68160*a^5*e^(2*I*d*x - 6*I*c)*log(I*e^(I*d*x + I*c) - 1) + 596400*a^5*e^(8*
I*d*x)*log(I*e^(I*d*x + I*c) - 1) + 8520*a^5*e^(-8*I*c)*log(I*e^(I*d*x + I*
c) - 1) - 39225*a^5*e^(16*I*d*x + 8*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 3138
00*a^5*e^(14*I*d*x + 6*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 1098300*a^5*e^(12
*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 2196600*a^5*e^(10*I*d*x + 2*I
*c)*log(-I*e^(I*d*x + I*c) + 1) - 2196600*a^5*e^(6*I*d*x - 2*I*c)*log(-I*e^
(I*d*x + I*c) + 1) - 1098300*a^5*e^(4*I*d*x - 4*I*c)*log(-I*e^(I*d*x + I*c)
 + 1) - 313800*a^5*e^(2*I*d*x - 6*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 274575
0*a^5*e^(8*I*d*x)*log(-I*e^(I*d*x + I*c) + 1) - 39225*a^5*e^(-8*I*c)*log(-I
*e^(I*d*x + I*c) + 1) - 8520*a^5*e^(16*I*d*x + 8*I*c)*log(-I*e^(I*d*x + I*c
) - 1) - 68160*a^5*e^(14*I*d*x + 6*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 23856
0*a^5*e^(12*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 477120*a^5*e^(10*I
```

```
*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 477120*a^5*e^(6*I*d*x - 2*I*c)*
log(-I*e^(I*d*x + I*c) - 1) - 238560*a^5*e^(4*I*d*x - 4*I*c)*log(-I*e^(I*d*
x + I*c) - 1) - 68160*a^5*e^(2*I*d*x - 6*I*c)*log(-I*e^(I*d*x + I*c) - 1) -
 596400*a^5*e^(8*I*d*x)*log(-I*e^(I*d*x + I*c) - 1) - 8520*a^5*e^(-8*I*c)*l
og(-I*e^(I*d*x + I*c) - 1) + 15*a^5*e^(16*I*d*x + 8*I*c)*log(I*e^(I*d*x) +
e^(-I*c)) + 120*a^5*e^(14*I*d*x + 6*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 420*
a^5*e^(12*I*d*x + 4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 840*a^5*e^(10*I*d*x
+ 2*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 840*a^5*e^(6*I*d*x - 2*I*c)*log(I*e^
(I*d*x) + e^(-I*c)) + 420*a^5*e^(4*I*d*x - 4*I*c)*log(I*e^(I*d*x) + e^(-I*c
)) + 120*a^5*e^(2*I*d*x - 6*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 1050*a^5*e^(
8*I*d*x)*log(I*e^(I*d*x) + e^(-I*c)) + 15*a^5*e^(-8*I*c)*log(I*e^(I*d*x) +
e^(-I*c)) - 15*a^5*e^(16*I*d*x + 8*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 120*
a^5*e^(14*I*d*x + 6*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 420*a^5*e^(12*I*d*x
 + 4*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 840*a^5*e^(10*I*d*x + 2*I*c)*log(-
I*e^(I*d*x) + e^(-I*c)) - 840*a^5*e^(6*I*d*x - 2*I*c)*log(-I*e^(I*d*x) + e^
(-I*c)) - 420*a^5*e^(4*I*d*x - 4*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 120*a^
5*e^(2*I*d*x - 6*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 1050*a^5*e^(8*I*d*x)*l
og(-I*e^(I*d*x) + e^(-I*c)) - 15*a^5*e^(-8*I*c)*log(-I*e^(I*d*x) + e^(-I*c)
) + 8192*I*a^5*e^(19*I*d*x + 11*I*c) + 16384*I*a^5*e^(17*I*d*x + 9*I*c) - 1
76128*I*a^5*e^(15*I*d*x + 7*I*c) - 1003520*I*a^5*e^(13*I*d*x + 5*I*c) - 243
7120*I*a^5*e^(11*I*d*x + 3*I*c) - 3411968*I*a^5*e^(9*I*d*x + I*c) - 2953216
*I*a^5*e^(7*I*d*x - I*c) - 1568768*I*a^5*e^(5*I*d*x - 3*I*c) - 471040*I*a^5
*e^(3*I*d*x - 5*I*c) - 61440*I*a^5*e^(I*d*x - 7*I*c))/(d*e^(16*I*d*x + 8*I*
c) + 8*d*e^(14*I*d*x + 6*I*c) + 28*d*e^(12*I*d*x + 4*I*c) + 56*d*e^(10*I*d*
x + 2*I*c) + 56*d*e^(6*I*d*x - 2*I*c) + 28*d*e^(4*I*d*x - 4*I*c) + 8*d*e^(2
*I*d*x - 6*I*c) + 70*d*e^(8*I*d*x) + d*e^(-8*I*c))
```

maple [A] time = 0.53, size = 179, normalized size = 1.83

$$\frac{ia^5\left(\sin^6(dx+c)\right)}{d\cos(dx+c)}+\frac{28ia^5\cos(dx+c)}{3d}+\frac{ia^5\cos(dx+c)\left(\sin^4(dx+c)\right)}{d}+\frac{14ia^5\cos(dx+c)\left(\sin^2(dx+c)\right)}{3d}-\frac{5a^5}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^5,x)
```

```
[Out] I/d*a^5*sin(d*x+c)^6/cos(d*x+c)+28/3*I/d*a^5*cos(d*x+c)+I/d*a^5*cos(d*x+c)*
sin(d*x+c)^4+14/3*I/d*a^5*cos(d*x+c)*sin(d*x+c)^2-5*a^5*sin(d*x+c)^3/d-13/3
*a^5*sin(d*x+c)/d+5/d*a^5*ln(sec(d*x+c)+tan(d*x+c))-5/3*I/d*a^5*cos(d*x+c)^
3+1/3/d*sin(d*x+c)*cos(d*x+c)^2*a^5
```

maxima [A] time = 0.75, size = 154, normalized size = 1.57

$$-\frac{10i\,a^5\cos(dx+c)^3+20\,a^5\sin(dx+c)^3+2i\left(\cos(dx+c)^3-\frac{3}{\cos(dx+c)}-6\,\cos(dx+c)\right)a^5+20i\left(\cos(dx+c\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] -1/6*(10*I*a^5*cos(d*x + c)^3 + 20*a^5*sin(d*x + c)^3 + 2*I*(cos(d*x + c)^3
 - 3/cos(d*x + c) - 6*cos(d*x + c))*a^5 + 20*I*(cos(d*x + c)^3 - 3*cos(d*x
+ c))*a^5 + 5*(2*sin(d*x + c)^3 - 3*log(sin(d*x + c) + 1) + 3*log(sin(d*x +
 c) - 1) + 6*sin(d*x + c))*a^5 + 2*(sin(d*x + c)^3 - 3*sin(d*x + c))*a^5)/d
```

mupad [B] time = 5.43, size = 162, normalized size = 1.65

$$\frac{10\,a^5\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d}-\frac{8\,a^5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+a^5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3 34\mathrm{i}-\frac{82\,a^5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2}{3}-a^5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4 3\mathrm{i}-4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2 4\mathrm{i}+3\tan\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^5,x)
```

```
[Out] (10*a^5*atanh(tan(c/2 + (d*x)/2)))/d - (a^5*tan(c/2 + (d*x)/2)^3*34i - (82*
a^5*tan(c/2 + (d*x)/2)^2)/3 + 8*a^5*tan(c/2 + (d*x)/2)^4 + (46*a^5)/3 - a^5
*tan(c/2 + (d*x)/2)*38i)/(d*(3*tan(c/2 + (d*x)/2) - tan(c/2 + (d*x)/2)^2*4i
 - 4*tan(c/2 + (d*x)/2)^3 + tan(c/2 + (d*x)/2)^4*3i + tan(c/2 + (d*x)/2)^5
+ 1i))
```

sympy [A] time = 0.54, size = 151, normalized size = 1.54

$$-\frac{2ia^5e^{ic}e^{idx}}{-de^{2ic}e^{2idx}-d}+\frac{5a^5\left(-\log\left(e^{idx}-ie^{-ic}\right)+\log\left(e^{idx}+ie^{-ic}\right)\right)}{d}+\begin{cases}\frac{-4ia^5de^{3ic}e^{3idx}+24ia^5de^{ic}e^{idx}}{3d^2} & \text{for } 3d^2\neq 0\\ x\left(4a^5e^{3ic}-8a^5e^{ic}\right) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3*(a+I*a*tan(d*x+c))**5,x)
```

```
[Out] -2*I*a**5*exp(I*c)*exp(I*d*x)/(-d*exp(2*I*c)*exp(2*I*d*x) - d) + 5*a**5*(-l
og(exp(I*d*x) - I*exp(-I*c)) + log(exp(I*d*x) + I*exp(-I*c)))/d + Piecewise
(((-4*I*a**5*d*exp(3*I*c)*exp(3*I*d*x) + 24*I*a**5*d*exp(I*c)*exp(I*d*x))/(
3*d**2), Ne(3*d**2, 0)), (x*(4*a**5*exp(3*I*c) - 8*a**5*exp(I*c)), True))
```

3.73 $\int \cos^5(c+dx)(a+ia\tan(c+dx))^5\,dx$

Optimal. Leaf size=32

$$-\frac{i\cos^5(c+dx)(a+ia\tan(c+dx))^5}{5d}$$

```
[Out] -1/5*I*cos(d*x+c)^5*(a+I*a*tan(d*x+c))^5/d
```

Rubi [A] time = 0.04, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.042$, Rules used = {3488}

$$-\frac{i\cos^5(c+dx)(a+ia\tan(c+dx))^5}{5d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] ((-I/5)*Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^5)/d
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rubi steps

$$\int \cos^5(c+dx)(a+ia\tan(c+dx))^5\,dx = -\frac{i\cos^5(c+dx)(a+ia\tan(c+dx))^5}{5d}$$

Mathematica [A] time = 0.16, size = 31, normalized size = 0.97

$$-\frac{ia^5(\cos(c+dx)+i\sin(c+dx))^5}{5d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] ((-1/5*I)*a^5*(Cos[c + d*x] + I*Sin[c + d*x])^5)/d
```

fricas [A] time = 0.42, size = 17, normalized size = 0.53

$$-\frac{i\,a^5e^{(5i\,dx+5i\,c)}}{5\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] -1/5*I*a^5*e^(5*I*d*x + 5*I*c)/d
```

giac [B] time = 6.63, size = 1669, normalized size = 52.16

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^5,x, algorithm="giac")
```

```
[Out] -1/122880*(34125*a^5*e^(16*I*d*x + 8*I*c)*log(I*e^(I*d*x + I*c) + 1) + 2730
00*a^5*e^(14*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*c) + 1) + 955500*a^5*e^(12*I
*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 1911000*a^5*e^(10*I*d*x + 2*I*c)
*log(I*e^(I*d*x + I*c) + 1) + 1911000*a^5*e^(6*I*d*x - 2*I*c)*log(I*e^(I*d*
x + I*c) + 1) + 955500*a^5*e^(4*I*d*x - 4*I*c)*log(I*e^(I*d*x + I*c) + 1) +
 273000*a^5*e^(2*I*d*x - 6*I*c)*log(I*e^(I*d*x + I*c) + 1) + 2388750*a^5*e^
(8*I*d*x)*log(I*e^(I*d*x + I*c) + 1) + 34125*a^5*e^(-8*I*c)*log(I*e^(I*d*x
+ I*c) + 1) + 34770*a^5*e^(16*I*d*x + 8*I*c)*log(I*e^(I*d*x + I*c) - 1) + 2
78160*a^5*e^(14*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*c) - 1) + 973560*a^5*e^(1
2*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) - 1) + 1947120*a^5*e^(10*I*d*x + 2*I
*c)*log(I*e^(I*d*x + I*c) - 1) + 1947120*a^5*e^(6*I*d*x - 2*I*c)*log(I*e^(I
*d*x + I*c) - 1) + 973560*a^5*e^(4*I*d*x - 4*I*c)*log(I*e^(I*d*x + I*c) - 1
) + 278160*a^5*e^(2*I*d*x - 6*I*c)*log(I*e^(I*d*x + I*c) - 1) + 2433900*a^5
*e^(8*I*d*x)*log(I*e^(I*d*x + I*c) - 1) + 34770*a^5*e^(-8*I*c)*log(I*e^(I*d
*x + I*c) - 1) - 34125*a^5*e^(16*I*d*x + 8*I*c)*log(-I*e^(I*d*x + I*c) + 1)
 - 273000*a^5*e^(14*I*d*x + 6*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 955500*a^5
*e^(12*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 1911000*a^5*e^(10*I*d*x
 + 2*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 1911000*a^5*e^(6*I*d*x - 2*I*c)*log
(-I*e^(I*d*x + I*c) + 1) - 955500*a^5*e^(4*I*d*x - 4*I*c)*log(-I*e^(I*d*x +
 I*c) + 1) - 273000*a^5*e^(2*I*d*x - 6*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 2
388750*a^5*e^(8*I*d*x)*log(-I*e^(I*d*x + I*c) + 1) - 34125*a^5*e^(-8*I*c)*l
og(-I*e^(I*d*x + I*c) + 1) - 34770*a^5*e^(16*I*d*x + 8*I*c)*log(-I*e^(I*d*x
 + I*c) - 1) - 278160*a^5*e^(14*I*d*x + 6*I*c)*log(-I*e^(I*d*x + I*c) - 1)
- 973560*a^5*e^(12*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 1947120*a^5
*e^(10*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 1947120*a^5*e^(6*I*d*x
- 2*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 973560*a^5*e^(4*I*d*x - 4*I*c)*log(-
I*e^(I*d*x + I*c) - 1) - 278160*a^5*e^(2*I*d*x - 6*I*c)*log(-I*e^(I*d*x + I
*c) - 1) - 2433900*a^5*e^(8*I*d*x)*log(-I*e^(I*d*x + I*c) - 1) - 34770*a^5*
e^(-8*I*c)*log(-I*e^(I*d*x + I*c) - 1) + 645*a^5*e^(16*I*d*x + 8*I*c)*log(I
*e^(I*d*x) + e^(-I*c)) + 5160*a^5*e^(14*I*d*x + 6*I*c)*log(I*e^(I*d*x) + e^
(-I*c)) + 18060*a^5*e^(12*I*d*x + 4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 3612
0*a^5*e^(10*I*d*x + 2*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 36120*a^5*e^(6*I*d
*x - 2*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 18060*a^5*e^(4*I*d*x - 4*I*c)*log
(I*e^(I*d*x) + e^(-I*c)) + 5160*a^5*e^(2*I*d*x - 6*I*c)*log(I*e^(I*d*x) + e
^(-I*c)) + 45150*a^5*e^(8*I*d*x)*log(I*e^(I*d*x) + e^(-I*c)) + 645*a^5*e^(-
8*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 645*a^5*e^(16*I*d*x + 8*I*c)*log(-I*e^
(I*d*x) + e^(-I*c)) - 5160*a^5*e^(14*I*d*x + 6*I*c)*log(-I*e^(I*d*x) + e^(-
I*c)) - 18060*a^5*e^(12*I*d*x + 4*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 36120
*a^5*e^(10*I*d*x + 2*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 36120*a^5*e^(6*I*d
*x - 2*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 18060*a^5*e^(4*I*d*x - 4*I*c)*lo
g(-I*e^(I*d*x) + e^(-I*c)) - 5160*a^5*e^(2*I*d*x - 6*I*c)*log(-I*e^(I*d*x)
+ e^(-I*c)) - 45150*a^5*e^(8*I*d*x)*log(-I*e^(I*d*x) + e^(-I*c)) - 645*a^5*
e^(-8*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 24576*I*a^5*e^(21*I*d*x + 13*I*c)
 + 196608*I*a^5*e^(19*I*d*x + 11*I*c) + 688128*I*a^5*e^(17*I*d*x + 9*I*c) +
 1376256*I*a^5*e^(15*I*d*x + 7*I*c) + 1720320*I*a^5*e^(13*I*d*x + 5*I*c) +
1376256*I*a^5*e^(11*I*d*x + 3*I*c) + 688128*I*a^5*e^(9*I*d*x + I*c) + 19660
8*I*a^5*e^(7*I*d*x - I*c) + 24576*I*a^5*e^(5*I*d*x - 3*I*c))/(d*e^(16*I*d*x
 + 8*I*c) + 8*d*e^(14*I*d*x + 6*I*c) + 28*d*e^(12*I*d*x + 4*I*c) + 56*d*e^(
10*I*d*x + 2*I*c) + 56*d*e^(6*I*d*x - 2*I*c) + 28*d*e^(4*I*d*x - 4*I*c) + 8
*d*e^(2*I*d*x - 6*I*c) + 70*d*e^(8*I*d*x) + d*e^(-8*I*c))
```

maple [B] time = 0.54, size = 170, normalized size = 5.31

$$\frac{-\frac{i a^5\left(\frac{8}{3}+\sin^4(dx+c)+\frac{4\left(\sin^2(dx+c)\right)}{3}\right)\cos(dx+c)}{5}+a^5\left(\sin^5(dx+c)\right)-10 i a^5\left(-\frac{\left(\cos^3(dx+c)\right)\left(\sin^2(dx+c)\right)}{5}-\frac{2\left(\cos^3(dx+c)\right)}{15}\right)-10 a^5\left(-\frac{\mathrm{si}\cdots}{}\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^5,x)
```

```
[Out] 1/d*(-1/5*I*a^5*(8/3+sin(d*x+c)^4+4/3*sin(d*x+c)^2)*cos(d*x+c)+a^5*sin(d*x+
c)^5-10*I*a^5*(-1/5*cos(d*x+c)^3*sin(d*x+c)^2-2/15*cos(d*x+c)^3)-10*a^5*(-1
/5*sin(d*x+c)*cos(d*x+c)^4+1/15*(2+cos(d*x+c)^2)*sin(d*x+c))-I*a^5*cos(d*x+
c)^5+1/5*a^5*(8/3+cos(d*x+c)^4+4/3*cos(d*x+c)^2)*sin(d*x+c))
```

maxima [B] time = 0.40, size = 152, normalized size = 4.75

$$-\frac{15i\,a^5\cos{(dx+c)}^5 - 15\,a^5\sin{(dx+c)}^5 + 10i\left(3\,\cos{(dx+c)}^5 - 5\,\cos{(dx+c)}^3\right)a^5 + i\left(3\,\cos{(dx+c)}^5 - 10\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] -1/15*(15*I*a^5*cos(d*x + c)^5 - 15*a^5*sin(d*x + c)^5 + 10*I*(3*cos(d*x +
c)^5 - 5*cos(d*x + c)^3)*a^5 + I*(3*cos(d*x + c)^5 - 10*cos(d*x + c)^3 + 15
*cos(d*x + c))*a^5 - 10*(3*sin(d*x + c)^5 - 5*sin(d*x + c)^3)*a^5 - (3*sin(
d*x + c)^5 - 10*sin(d*x + c)^3 + 15*sin(d*x + c))*a^5)/d
```

mupad [B] time = 3.45, size = 104, normalized size = 3.25

$$\frac{2\,a^5\,\left(5\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-10\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)}{5\,d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4\,5{}\mathrm{i}-10\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2\,10{}\mathrm{i}+5\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+1{}\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^5,x)
```

```
[Out] (2*a^5*(5*tan(c/2 + (d*x)/2)^4 - 10*tan(c/2 + (d*x)/2)^2 + 1))/(5*d*(5*tan(
c/2 + (d*x)/2) - tan(c/2 + (d*x)/2)^2*10i - 10*tan(c/2 + (d*x)/2)^3 + tan(c
/2 + (d*x)/2)^4*5i + tan(c/2 + (d*x)/2)^5 + 1i))
```

sympy [A] time = 0.39, size = 37, normalized size = 1.16

$$\begin{cases} -\frac{ia^5e^{5ic}e^{5idx}}{5d} & \text{for } 5d \neq 0 \\ a^5xe^{5ic} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**5*(a+I*a*tan(d*x+c))**5,x)
```

```
[Out] Piecewise((-I*a**5*exp(5*I*c)*exp(5*I*d*x)/(5*d), Ne(5*d, 0)), (a**5*x*exp(
5*I*c), True))
```

3.74 $\int \cos^7(c+dx)(a+ia\tan(c+dx))^5\,dx$

Optimal. Leaf size=101

$$-\frac{2ia^2\cos^3(c+dx)(a+ia\tan(c+dx))^3}{105d}-\frac{i\cos^7(c+dx)(a+ia\tan(c+dx))^5}{7d}-\frac{2ia\cos^5(c+dx)(a+ia\tan(c+dx))}{35d}$$

```
[Out] -2/105*I*a^2*cos(d*x+c)^3*(a+I*a*tan(d*x+c))^3/d-2/35*I*a*cos(d*x+c)^5*(a+I
*a*tan(d*x+c))^4/d-1/7*I*cos(d*x+c)^7*(a+I*a*tan(d*x+c))^5/d
```

Rubi [A] time = 0.11, antiderivative size = 101, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3497, 3488}

$$-\frac{2ia^2\cos^3(c+dx)(a+ia\tan(c+dx))^3}{105d}-\frac{i\cos^7(c+dx)(a+ia\tan(c+dx))^5}{7d}-\frac{2ia\cos^5(c+dx)(a+ia\tan(c+dx))}{35d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^7*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (((-2*I)/105)*a^2*Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^3)/d - (((2*I)/35)*
a*Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^4)/d - ((I/7)*Cos[c + d*x]^7*(a + I
*a*Tan[c + d*x])^5)/d
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rubi steps

$$\begin{aligned}\int \cos^7(c+dx)(a+ia\tan(c+dx))^5\,dx &= -\frac{i\cos^7(c+dx)(a+ia\tan(c+dx))^5}{7d}+\frac{1}{7}(2a)\int \cos^5(c+dx)(a+ia\tan \\ &= -\frac{2ia\cos^5(c+dx)(a+ia\tan(c+dx))^4}{35d}-\frac{i\cos^7(c+dx)(a+ia\tan(c+d}{7d} \\ &= -\frac{2ia^2\cos^3(c+dx)(a+ia\tan(c+dx))^3}{105d}-\frac{2ia\cos^5(c+dx)(a+ia\tan(c}{35d}\end{aligned}$$

Mathematica [A] time = 1.00, size = 55, normalized size = 0.54

$$\frac{a^5(-10i\sin(2(c+dx))+25\cos(2(c+dx))+21)(\sin(5(c+dx))-i\cos(5(c+dx)))}{210d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^7*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (a^5*(21 + 25*Cos[2*(c + d*x)] - (10*I)*Sin[2*(c + d*x)])*((-I)*Cos[5*(c +
d*x)] + Sin[5*(c + d*x)]))/(210*d)
```

fricas [A] time = 0.54, size = 48, normalized size = 0.48

$$\frac{-15i\,a^5e^{(7i\,dx+7i\,c)} - 42i\,a^5e^{(5i\,dx+5i\,c)} - 35i\,a^5e^{(3i\,dx+3i\,c)}}{420\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/420*(-15*I*a^5*e^(7*I*d*x + 7*I*c) - 42*I*a^5*e^(5*I*d*x + 5*I*c) - 35*I*
a^5*e^(3*I*d*x + 3*I*c))/d
```

giac [B] time = 6.69, size = 1697, normalized size = 16.80

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^5,x, algorithm="giac")
```

```
[Out] -1/3440640*(7357770*a^5*e^(16*I*d*x + 8*I*c)*log(I*e^(I*d*x + I*c) + 1) + 5
8862160*a^5*e^(14*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*c) + 1) + 206017560*a^5
*e^(12*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 412035120*a^5*e^(10*I*d*
x + 2*I*c)*log(I*e^(I*d*x + I*c) + 1) + 412035120*a^5*e^(6*I*d*x - 2*I*c)*l
og(I*e^(I*d*x + I*c) + 1) + 206017560*a^5*e^(4*I*d*x - 4*I*c)*log(I*e^(I*d*
x + I*c) + 1) + 58862160*a^5*e^(2*I*d*x - 6*I*c)*log(I*e^(I*d*x + I*c) + 1)
 + 515043900*a^5*e^(8*I*d*x)*log(I*e^(I*d*x + I*c) + 1) + 7357770*a^5*e^(-8
*I*c)*log(I*e^(I*d*x + I*c) + 1) + 7390425*a^5*e^(16*I*d*x + 8*I*c)*log(I*e
^(I*d*x + I*c) - 1) + 59123400*a^5*e^(14*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*
c) - 1) + 206931900*a^5*e^(12*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) - 1) + 4
13863800*a^5*e^(10*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) - 1) + 413863800*a^
5*e^(6*I*d*x - 2*I*c)*log(I*e^(I*d*x + I*c) - 1) + 206931900*a^5*e^(4*I*d*x
 - 4*I*c)*log(I*e^(I*d*x + I*c) - 1) + 59123400*a^5*e^(2*I*d*x - 6*I*c)*log
(I*e^(I*d*x + I*c) - 1) + 517329750*a^5*e^(8*I*d*x)*log(I*e^(I*d*x + I*c) -
 1) + 7390425*a^5*e^(-8*I*c)*log(I*e^(I*d*x + I*c) - 1) - 7357770*a^5*e^(16
*I*d*x + 8*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 58862160*a^5*e^(14*I*d*x + 6*
I*c)*log(-I*e^(I*d*x + I*c) + 1) - 206017560*a^5*e^(12*I*d*x + 4*I*c)*log(-
I*e^(I*d*x + I*c) + 1) - 412035120*a^5*e^(10*I*d*x + 2*I*c)*log(-I*e^(I*d*x
 + I*c) + 1) - 412035120*a^5*e^(6*I*d*x - 2*I*c)*log(-I*e^(I*d*x + I*c) + 1
) - 206017560*a^5*e^(4*I*d*x - 4*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 5886216
0*a^5*e^(2*I*d*x - 6*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 515043900*a^5*e^(8*
I*d*x)*log(-I*e^(I*d*x + I*c) + 1) - 7357770*a^5*e^(-8*I*c)*log(-I*e^(I*d*x
 + I*c) + 1) - 7390425*a^5*e^(16*I*d*x + 8*I*c)*log(-I*e^(I*d*x + I*c) - 1)
 - 59123400*a^5*e^(14*I*d*x + 6*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 20693190
0*a^5*e^(12*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 413863800*a^5*e^(1
0*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 413863800*a^5*e^(6*I*d*x - 2
*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 206931900*a^5*e^(4*I*d*x - 4*I*c)*log(-
I*e^(I*d*x + I*c) - 1) - 59123400*a^5*e^(2*I*d*x - 6*I*c)*log(-I*e^(I*d*x +
 I*c) - 1) - 517329750*a^5*e^(8*I*d*x)*log(-I*e^(I*d*x + I*c) - 1) - 739042
5*a^5*e^(-8*I*c)*log(-I*e^(I*d*x + I*c) - 1) + 32655*a^5*e^(16*I*d*x + 8*I*
c)*log(I*e^(I*d*x) + e^(-I*c)) + 261240*a^5*e^(14*I*d*x + 6*I*c)*log(I*e^(I
*d*x) + e^(-I*c)) + 914340*a^5*e^(12*I*d*x + 4*I*c)*log(I*e^(I*d*x) + e^(-I
*c)) + 1828680*a^5*e^(10*I*d*x + 2*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 18286
80*a^5*e^(6*I*d*x - 2*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 914340*a^5*e^(4*I*
d*x - 4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 261240*a^5*e^(2*I*d*x - 6*I*c)*l
og(I*e^(I*d*x) + e^(-I*c)) + 2285850*a^5*e^(8*I*d*x)*log(I*e^(I*d*x) + e^(-
I*c)) + 32655*a^5*e^(-8*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 32655*a^5*e^(16*
I*d*x + 8*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 261240*a^5*e^(14*I*d*x + 6*I*
c)*log(-I*e^(I*d*x) + e^(-I*c)) - 914340*a^5*e^(12*I*d*x + 4*I*c)*log(-I*e^
```

```
(I*d*x) + e^(-I*c)) - 1828680*a^5*e^(10*I*d*x + 2*I*c)*log(-I*e^(I*d*x) + e
^(-I*c)) - 1828680*a^5*e^(6*I*d*x - 2*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 9
14340*a^5*e^(4*I*d*x - 4*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 261240*a^5*e^(
2*I*d*x - 6*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 2285850*a^5*e^(8*I*d*x)*log
(-I*e^(I*d*x) + e^(-I*c)) - 32655*a^5*e^(-8*I*c)*log(-I*e^(I*d*x) + e^(-I*c
)) + 122880*I*a^5*e^(23*I*d*x + 15*I*c) + 1327104*I*a^5*e^(21*I*d*x + 13*I*
c) + 6479872*I*a^5*e^(19*I*d*x + 11*I*c) + 18808832*I*a^5*e^(17*I*d*x + 9*I
*c) + 35897344*I*a^5*e^(15*I*d*x + 7*I*c) + 47022080*I*a^5*e^(13*I*d*x + 5*
I*c) + 42778624*I*a^5*e^(11*I*d*x + 3*I*c) + 26673152*I*a^5*e^(9*I*d*x + I*
c) + 10903552*I*a^5*e^(7*I*d*x - I*c) + 2637824*I*a^5*e^(5*I*d*x - 3*I*c) +
 286720*I*a^5*e^(3*I*d*x - 5*I*c))/(d*e^(16*I*d*x + 8*I*c) + 8*d*e^(14*I*d*
x + 6*I*c) + 28*d*e^(12*I*d*x + 4*I*c) + 56*d*e^(10*I*d*x + 2*I*c) + 56*d*e
^(6*I*d*x - 2*I*c) + 28*d*e^(4*I*d*x - 4*I*c) + 8*d*e^(2*I*d*x - 6*I*c) + 7
0*d*e^(8*I*d*x) + d*e^(-8*I*c))
```

maple [B] time = 0.60, size = 257, normalized size = 2.54

$$\frac{ia^5\left(-\frac{\left(\sin^4(dx+c)\right)\left(\cos^3(dx+c)\right)}{7}-\frac{4\left(\cos^3(dx+c)\right)\left(\sin^2(dx+c)\right)}{35}-\frac{8\left(\cos^3(dx+c)\right)}{105}\right)+5a^5\left(-\frac{\left(\sin^3(dx+c)\right)\left(\cos^4(dx+c)\right)}{7}-\frac{3\sin(dx+c)\left(\cos^4(dx+c)\right.}{35}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^5,x)
```

```
[Out] 1/d*(I*a^5*(-1/7*sin(d*x+c)^4*cos(d*x+c)^3-4/35*cos(d*x+c)^3*sin(d*x+c)^2-8
/105*cos(d*x+c)^3)+5*a^5*(-1/7*sin(d*x+c)^3*cos(d*x+c)^4-3/35*sin(d*x+c)*co
s(d*x+c)^4+1/35*(2+cos(d*x+c)^2)*sin(d*x+c))-10*I*a^5*(-1/7*sin(d*x+c)^2*co
s(d*x+c)^5-2/35*cos(d*x+c)^5)-10*a^5*(-1/7*sin(d*x+c)*cos(d*x+c)^6+1/35*(8/
3+cos(d*x+c)^4+4/3*cos(d*x+c)^2)*sin(d*x+c))-5/7*I*a^5*cos(d*x+c)^7+1/7*a^5
*(16/5+cos(d*x+c)^6+6/5*cos(d*x+c)^4+8/5*cos(d*x+c)^2)*sin(d*x+c))
```

maxima [B] time = 0.37, size = 187, normalized size = 1.85

$$-\frac{75i\,a^5\cos\left(dx+c\right)^7+i\left(15\,\cos\left(dx+c\right)^7-42\,\cos\left(dx+c\right)^5+35\,\cos\left(dx+c\right)^3\right)a^5+30i\left(5\,\cos\left(dx+c\right)^7-7\,\cos\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] -1/105*(75*I*a^5*cos(d*x + c)^7 + I*(15*cos(d*x + c)^7 - 42*cos(d*x + c)^5
+ 35*cos(d*x + c)^3)*a^5 + 30*I*(5*cos(d*x + c)^7 - 7*cos(d*x + c)^5)*a^5 +
 10*(15*sin(d*x + c)^7 - 42*sin(d*x + c)^5 + 35*sin(d*x + c)^3)*a^5 + 15*(5
*sin(d*x + c)^7 - 7*sin(d*x + c)^5)*a^5 + 3*(5*sin(d*x + c)^7 - 21*sin(d*x
+ c)^5 + 35*sin(d*x + c)^3 - 35*sin(d*x + c))*a^5)/d
```

mupad [B] time = 4.21, size = 186, normalized size = 1.84

$$-\frac{2\,a^5\,\left(105\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5\,210{}\mathrm{i}-455\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3\,350{}\mathrm{i}+273\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right.\right.}{105\,d\,\left(-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6\,7{}\mathrm{i}+21\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4\,35{}\mathrm{i}-35\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3-\tan\left(\frac{c}{2}+\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^7*(a + a*tan(c + d*x)*1i)^5,x)
```

```
[Out] -(2*a^5*(tan(c/2 + (d*x)/2)*56i + 273*tan(c/2 + (d*x)/2)^2 - tan(c/2 + (d*x
)/2)^3*350i - 455*tan(c/2 + (d*x)/2)^4 + tan(c/2 + (d*x)/2)^5*210i + 105*ta
```

```
n(c/2 + (d*x)/2)^6 - 23))/(105*d*(7*tan(c/2 + (d*x)/2) - tan(c/2 + (d*x)/2)
^2*21i - 35*tan(c/2 + (d*x)/2)^3 + tan(c/2 + (d*x)/2)^4*35i + 21*tan(c/2 +
(d*x)/2)^5 - tan(c/2 + (d*x)/2)^6*7i - tan(c/2 + (d*x)/2)^7 + 1i))
```

sympy [A] time = 0.62, size = 122, normalized size = 1.21

$$\begin{cases} -\frac{120ia^5d^2e^{7ic}e^{7idx}+336ia^5d^2e^{5ic}e^{5idx}+280ia^5d^2e^{3ic}e^{3idx}}{3360d^3} & \text{for } 3360d^3 \neq 0 \\ x\left(\frac{a^5e^{7ic}}{4}+\frac{a^5e^{5ic}}{2}+\frac{a^5e^{3ic}}{4}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**7*(a+I*a*tan(d*x+c))**5,x)
```

```
[Out] Piecewise((-(120*I*a**5*d**2*exp(7*I*c)*exp(7*I*d*x) + 336*I*a**5*d**2*exp(
5*I*c)*exp(5*I*d*x) + 280*I*a**5*d**2*exp(3*I*c)*exp(3*I*d*x))/(3360*d**3),
 Ne(3360*d**3, 0)), (x*(a**5*exp(7*I*c)/4 + a**5*exp(5*I*c)/2 + a**5*exp(3*
I*c)/4), True))
```

3.75 $\int \cos^9(c+dx)(a+ia\tan(c+dx))^5\,dx$

Optimal. Leaf size=141

$$\frac{a^5\sin^5(c+dx)}{105d}-\frac{2a^5\sin^3(c+dx)}{63d}+\frac{a^5\sin(c+dx)}{21d}-\frac{ia^5\cos^5(c+dx)}{105d}-\frac{2ia^3\cos^7(c+dx)(a+ia\tan(c+dx))^2}{63d}-\frac{2ia\,c}{}$$

```
[Out] -1/105*I*a^5*cos(d*x+c)^5/d+1/21*a^5*sin(d*x+c)/d-2/63*a^5*sin(d*x+c)^3/d+1
/105*a^5*sin(d*x+c)^5/d-2/63*I*a^3*cos(d*x+c)^7*(a+I*a*tan(d*x+c))^2/d-2/9*
I*a*cos(d*x+c)^9*(a+I*a*tan(d*x+c))^4/d
```

Rubi [A] time = 0.12, antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3496, 3486, 2633}

$$\frac{a^5\sin^5(c+dx)}{105d}-\frac{2a^5\sin^3(c+dx)}{63d}+\frac{a^5\sin(c+dx)}{21d}-\frac{ia^5\cos^5(c+dx)}{105d}-\frac{2ia^3\cos^7(c+dx)(a+ia\tan(c+dx))^2}{63d}-\frac{2ia\,c}{}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^9*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] ((-I/105)*a^5*Cos[c + d*x]^5)/d + (a^5*Sin[c + d*x])/(21*d) - (2*a^5*Sin[c
+ d*x]^3)/(63*d) + (a^5*Sin[c + d*x]^5)/(105*d) - (((2*I)/63)*a^3*Cos[c + d
*x]^7*(a + I*a*Tan[c + d*x])^2)/d - (((2*I)/9)*a*Cos[c + d*x]^9*(a + I*a*Ta
n[c + d*x])^4)/d
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3486

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

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rubi steps

$$\int \cos^9(c+dx)(a+ia\tan(c+dx))^5\,dx = -\frac{2ia\cos^9(c+dx)(a+ia\tan(c+dx))^4}{9d} + \frac{1}{9}a^2\int \cos^7(c+dx)(a+ia$$
$$= -\frac{2ia^3\cos^7(c+dx)(a+ia\tan(c+dx))^2}{63d} - \frac{2ia\cos^9(c+dx)(a+ia\tan$$
$$= -\frac{ia^5\cos^5(c+dx)}{105d} - \frac{2ia^3\cos^7(c+dx)(a+ia\tan(c+dx))^2}{63d} - \frac{2ia\cos$$
$$= -\frac{ia^5\cos^5(c+dx)}{105d} - \frac{2ia^3\cos^7(c+dx)(a+ia\tan(c+dx))^2}{63d} - \frac{2ia\cos$$
$$= -\frac{ia^5\cos^5(c+dx)}{105d} + \frac{a^5\sin(c+dx)}{21d} - \frac{2a^5\sin^3(c+dx)}{63d} + \frac{a^5\sin^5(c+}{105d}$$

Mathematica [A] time = 0.98, size = 94, normalized size = 0.67

$$\frac{a^5(-120i\sin(2(c+dx)) - 140i\sin(4(c+dx)) + 300\cos(2(c+dx)) + 175\cos(4(c+dx)) + 189)(\sin(5(c+2dx)}{2520d(\cos(dx)+i\sin(dx))^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^9*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (a^5*(189 + 300*Cos[2*(c + d*x)] + 175*Cos[4*(c + d*x)] - (120*I)*Sin[2*(c
+ d*x)] - (140*I)*Sin[4*(c + d*x)])*((-I)*Cos[5*(c + 2*d*x)] + Sin[5*(c + 2
*d*x)]))/(2520*d*(Cos[d*x] + I*Sin[d*x])^5)
```

fricas [A] time = 0.57, size = 76, normalized size = 0.54

$$\frac{-35i\,a^5e^{(9i\,dx+9i\,c)} - 180i\,a^5e^{(7i\,dx+7i\,c)} - 378i\,a^5e^{(5i\,dx+5i\,c)} - 420i\,a^5e^{(3i\,dx+3i\,c)} - 315i\,a^5e^{(i\,dx+i\,c)}}{5040\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/5040*(-35*I*a^5*e^(9*I*d*x + 9*I*c) - 180*I*a^5*e^(7*I*d*x + 7*I*c) - 378
*I*a^5*e^(5*I*d*x + 5*I*c) - 420*I*a^5*e^(3*I*d*x + 3*I*c) - 315*I*a^5*e^(I
*d*x + I*c))/d
```

giac [B] time = 6.27, size = 1725, normalized size = 12.23

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^5,x, algorithm="giac")
```

```
[Out] -1/41287680*(69853455*a^5*e^(16*I*d*x + 8*I*c)*log(I*e^(I*d*x + I*c) + 1) +
 558827640*a^5*e^(14*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*c) + 1) + 1955896740
*a^5*e^(12*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 3911793480*a^5*e^(10
*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) + 1) + 3911793480*a^5*e^(6*I*d*x - 2*
I*c)*log(I*e^(I*d*x + I*c) + 1) + 1955896740*a^5*e^(4*I*d*x - 4*I*c)*log(I*
e^(I*d*x + I*c) + 1) + 558827640*a^5*e^(2*I*d*x - 6*I*c)*log(I*e^(I*d*x + I
*c) + 1) + 4889741850*a^5*e^(8*I*d*x)*log(I*e^(I*d*x + I*c) + 1) + 69853455
*a^5*e^(-8*I*c)*log(I*e^(I*d*x + I*c) + 1) + 70703325*a^5*e^(16*I*d*x + 8*I
*c)*log(I*e^(I*d*x + I*c) - 1) + 565626600*a^5*e^(14*I*d*x + 6*I*c)*log(I*e
^(I*d*x + I*c) - 1) + 1979693100*a^5*e^(12*I*d*x + 4*I*c)*log(I*e^(I*d*x +
I*c) - 1) + 3959386200*a^5*e^(10*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) - 1)
+ 3959386200*a^5*e^(6*I*d*x - 2*I*c)*log(I*e^(I*d*x + I*c) - 1) + 197969310
0*a^5*e^(4*I*d*x - 4*I*c)*log(I*e^(I*d*x + I*c) - 1) + 565626600*a^5*e^(2*I
```

```
*d*x - 6*I*c)*log(I*e^(I*d*x + I*c) - 1) + 4949232750*a^5*e^(8*I*d*x)*log(I
*e^(I*d*x + I*c) - 1) + 70703325*a^5*e^(-8*I*c)*log(I*e^(I*d*x + I*c) - 1)
- 69853455*a^5*e^(16*I*d*x + 8*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 558827640
*a^5*e^(14*I*d*x + 6*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 1955896740*a^5*e^(1
2*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 3911793480*a^5*e^(10*I*d*x +
 2*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 3911793480*a^5*e^(6*I*d*x - 2*I*c)*lo
g(-I*e^(I*d*x + I*c) + 1) - 1955896740*a^5*e^(4*I*d*x - 4*I*c)*log(-I*e^(I*
d*x + I*c) + 1) - 558827640*a^5*e^(2*I*d*x - 6*I*c)*log(-I*e^(I*d*x + I*c)
+ 1) - 4889741850*a^5*e^(8*I*d*x)*log(-I*e^(I*d*x + I*c) + 1) - 69853455*a^
5*e^(-8*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 70703325*a^5*e^(16*I*d*x + 8*I*c
)*log(-I*e^(I*d*x + I*c) - 1) - 565626600*a^5*e^(14*I*d*x + 6*I*c)*log(-I*e
^(I*d*x + I*c) - 1) - 1979693100*a^5*e^(12*I*d*x + 4*I*c)*log(-I*e^(I*d*x +
 I*c) - 1) - 3959386200*a^5*e^(10*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) - 1
) - 3959386200*a^5*e^(6*I*d*x - 2*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 197969
3100*a^5*e^(4*I*d*x - 4*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 565626600*a^5*e^
(2*I*d*x - 6*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 4949232750*a^5*e^(8*I*d*x)*
log(-I*e^(I*d*x + I*c) - 1) - 70703325*a^5*e^(-8*I*c)*log(-I*e^(I*d*x + I*c
) - 1) + 849870*a^5*e^(16*I*d*x + 8*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 6798
960*a^5*e^(14*I*d*x + 6*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 23796360*a^5*e^(
12*I*d*x + 4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 47592720*a^5*e^(10*I*d*x +
2*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 47592720*a^5*e^(6*I*d*x - 2*I*c)*log(I
*e^(I*d*x) + e^(-I*c)) + 23796360*a^5*e^(4*I*d*x - 4*I*c)*log(I*e^(I*d*x) +
 e^(-I*c)) + 6798960*a^5*e^(2*I*d*x - 6*I*c)*log(I*e^(I*d*x) + e^(-I*c)) +
59490900*a^5*e^(8*I*d*x)*log(I*e^(I*d*x) + e^(-I*c)) + 849870*a^5*e^(-8*I*c
)*log(I*e^(I*d*x) + e^(-I*c)) - 849870*a^5*e^(16*I*d*x + 8*I*c)*log(-I*e^(I
*d*x) + e^(-I*c)) - 6798960*a^5*e^(14*I*d*x + 6*I*c)*log(-I*e^(I*d*x) + e^(
-I*c)) - 23796360*a^5*e^(12*I*d*x + 4*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 4
7592720*a^5*e^(10*I*d*x + 2*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 47592720*a^
5*e^(6*I*d*x - 2*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 23796360*a^5*e^(4*I*d*
x - 4*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 6798960*a^5*e^(2*I*d*x - 6*I*c)*l
og(-I*e^(I*d*x) + e^(-I*c)) - 59490900*a^5*e^(8*I*d*x)*log(-I*e^(I*d*x) + e
^(-I*c)) - 849870*a^5*e^(-8*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 286720*I*a^
5*e^(25*I*d*x + 17*I*c) + 3768320*I*a^5*e^(23*I*d*x + 15*I*c) + 22921216*I*
a^5*e^(21*I*d*x + 13*I*c) + 85557248*I*a^5*e^(19*I*d*x + 11*I*c) + 21945548
8*I*a^5*e^(17*I*d*x + 9*I*c) + 409665536*I*a^5*e^(15*I*d*x + 7*I*c) + 57229
3120*I*a^5*e^(13*I*d*x + 5*I*c) + 602341376*I*a^5*e^(11*I*d*x + 3*I*c) + 47
2096768*I*a^5*e^(9*I*d*x + I*c) + 267091968*I*a^5*e^(7*I*d*x - I*c) + 10287
5136*I*a^5*e^(5*I*d*x - 3*I*c) + 24084480*I*a^5*e^(3*I*d*x - 5*I*c) + 25804
80*I*a^5*e^(I*d*x - 7*I*c))/(d*e^(16*I*d*x + 8*I*c) + 8*d*e^(14*I*d*x + 6*I
*c) + 28*d*e^(12*I*d*x + 4*I*c) + 56*d*e^(10*I*d*x + 2*I*c) + 56*d*e^(6*I*d
*x - 2*I*c) + 28*d*e^(4*I*d*x - 4*I*c) + 8*d*e^(2*I*d*x - 6*I*c) + 70*d*e^(
8*I*d*x) + d*e^(-8*I*c))
```

maple [B] time = 0.54, size = 287, normalized size = 2.04

$$\frac{ia^5\left(-\frac{(\sin^4(dx+c))(\cos^5(dx+c))}{9}-\frac{4(\sin^2(dx+c))(\cos^5(dx+c))}{63}-\frac{8(\cos^5(dx+c))}{315}\right)+5a^5\left(-\frac{(\sin^3(dx+c))(\cos^6(dx+c))}{9}-\frac{\sin(dx+c)(\cos^6(dx+c)}{21}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^5,x)
```

```
[Out] 1/d*(I*a^5*(-1/9*sin(d*x+c)^4*cos(d*x+c)^5-4/63*sin(d*x+c)^2*cos(d*x+c)^5-8
/315*cos(d*x+c)^5)+5*a^5*(-1/9*sin(d*x+c)^3*cos(d*x+c)^6-1/21*sin(d*x+c)*co
s(d*x+c)^6+1/105*(8/3+cos(d*x+c)^4+4/3*cos(d*x+c)^2)*sin(d*x+c))-10*I*a^5*(
-1/9*sin(d*x+c)^2*cos(d*x+c)^7-2/63*cos(d*x+c)^7)-10*a^5*(-1/9*sin(d*x+c)*c
os(d*x+c)^8+1/63*(16/5+cos(d*x+c)^6+6/5*cos(d*x+c)^4+8/5*cos(d*x+c)^2)*sin(
d*x+c))-5/9*I*a^5*cos(d*x+c)^9+1/9*a^5*(128/35+cos(d*x+c)^8+8/7*cos(d*x+c)^
6+48/35*cos(d*x+c)^4+64/35*cos(d*x+c)^2)*sin(d*x+c))
```

maxima [A] time = 0.55, size = 217, normalized size = 1.54

$$-\frac{175i\,a^5\cos\left(dx+c\right)^9+i\left(35\,\cos\left(dx+c\right)^9-90\,\cos\left(dx+c\right)^7+63\,\cos\left(dx+c\right)^5\right)a^5+50i\left(7\,\cos\left(dx+c\right)^9-9\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] -1/315*(175*I*a^5*cos(d*x + c)^9 + I*(35*cos(d*x + c)^9 - 90*cos(d*x + c)^7
 + 63*cos(d*x + c)^5)*a^5 + 50*I*(7*cos(d*x + c)^9 - 9*cos(d*x + c)^7)*a^5
- 5*(35*sin(d*x + c)^9 - 90*sin(d*x + c)^7 + 63*sin(d*x + c)^5)*a^5 - 10*(3
5*sin(d*x + c)^9 - 135*sin(d*x + c)^7 + 189*sin(d*x + c)^5 - 105*sin(d*x +
c)^3)*a^5 - (35*sin(d*x + c)^9 - 180*sin(d*x + c)^7 + 378*sin(d*x + c)^5 -
420*sin(d*x + c)^3 + 315*sin(d*x + c))*a^5)/d
```

mupad [B] time = 3.94, size = 79, normalized size = 0.56

$$-\frac{a^5\left(\frac{e^{c\,1i+d\,x\,1i}\,1i}{16}+\frac{e^{c\,3i+d\,x\,3i}\,1i}{12}+\frac{e^{c\,5i+d\,x\,5i}\,3i}{40}+\frac{e^{c\,7i+d\,x\,7i}\,1i}{28}+\frac{e^{c\,9i+d\,x\,9i}\,1i}{144}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^9*(a + a*tan(c + d*x)*1i)^5,x)
```

```
[Out] -(a^5*((exp(c*1i + d*x*1i)*1i)/16 + (exp(c*3i + d*x*3i)*1i)/12 + (exp(c*5i
+ d*x*5i)*3i)/40 + (exp(c*7i + d*x*7i)*1i)/28 + (exp(c*9i + d*x*9i)*1i)/144
))/d
```

sympy [A] time = 0.77, size = 194, normalized size = 1.38

$$\begin{cases} -\frac{215040ia^5d^4e^{9ic}e^{9idx}+1105920ia^5d^4e^{7ic}e^{7idx}+2322432ia^5d^4e^{5ic}e^{5idx}+2580480ia^5d^4e^{3ic}e^{3idx}+1935360ia^5d^4e^{ic}e^{idx}}{30965760d^5} & \text{for } 30965760d^5 \neq 0 \\ x\left(\frac{a^5e^{9ic}}{16}+\frac{a^5e^{7ic}}{4}+\frac{3a^5e^{5ic}}{8}+\frac{a^5e^{3ic}}{4}+\frac{a^5e^{ic}}{16}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**9*(a+I*a*tan(d*x+c))**5,x)
```

```
[Out] Piecewise((-(215040*I*a**5*d**4*exp(9*I*c)*exp(9*I*d*x) + 1105920*I*a**5*d*
*4*exp(7*I*c)*exp(7*I*d*x) + 2322432*I*a**5*d**4*exp(5*I*c)*exp(5*I*d*x) +
2580480*I*a**5*d**4*exp(3*I*c)*exp(3*I*d*x) + 1935360*I*a**5*d**4*exp(I*c)*
exp(I*d*x))/(30965760*d**5), Ne(30965760*d**5, 0)), (x*(a**5*exp(9*I*c)/16
+ a**5*exp(7*I*c)/4 + 3*a**5*exp(5*I*c)/8 + a**5*exp(3*I*c)/4 + a**5*exp(I*
c)/16), True))
```

3.76 $\int \cos^{11}(c+dx)(a+ia\tan(c+dx))^5\,dx$

Optimal. Leaf size=159

$$-\frac{5a^5\sin^7(c+dx)}{231d}+\frac{a^5\sin^5(c+dx)}{11d}-\frac{5a^5\sin^3(c+dx)}{33d}+\frac{5a^5\sin(c+dx)}{33d}-\frac{5ia^5\cos^7(c+dx)}{231d}-\frac{2ia^3\cos^9(c+dx)(a+}{33d}$$

```
[Out] -5/231*I*a^5*cos(d*x+c)^7/d+5/33*a^5*sin(d*x+c)/d-5/33*a^5*sin(d*x+c)^3/d+1
/11*a^5*sin(d*x+c)^5/d-5/231*a^5*sin(d*x+c)^7/d-2/33*I*a^3*cos(d*x+c)^9*(a+
I*a*tan(d*x+c))^2/d-2/11*I*a*cos(d*x+c)^11*(a+I*a*tan(d*x+c))^4/d
```

Rubi [A] time = 0.13, antiderivative size = 159, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3496, 3486, 2633}

$$-\frac{5a^5\sin^7(c+dx)}{231d}+\frac{a^5\sin^5(c+dx)}{11d}-\frac{5a^5\sin^3(c+dx)}{33d}+\frac{5a^5\sin(c+dx)}{33d}-\frac{5ia^5\cos^7(c+dx)}{231d}-\frac{2ia^3\cos^9(c+dx)(a+}{33d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^11*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (((-5*I)/231)*a^5*Cos[c + d*x]^7)/d + (5*a^5*Sin[c + d*x])/(33*d) - (5*a^5*
Sin[c + d*x]^3)/(33*d) + (a^5*Sin[c + d*x]^5)/(11*d) - (5*a^5*Sin[c + d*x]^
7)/(231*d) - (((2*I)/33)*a^3*Cos[c + d*x]^9*(a + I*a*Tan[c + d*x])^2)/d - (
((2*I)/11)*a*Cos[c + d*x]^11*(a + I*a*Tan[c + d*x])^4)/d
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3486

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

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rubi steps

$$\int \cos^{11}(c+dx)(a+ia\tan(c+dx))^5\,dx = -\frac{2ia\cos^{11}(c+dx)(a+ia\tan(c+dx))^4}{11d} + \frac{1}{11}\left(3a^2\right)\int \cos^9(c+dx)($$
$$= -\frac{2ia^3\cos^9(c+dx)(a+ia\tan(c+dx))^2}{33d} - \frac{2ia\cos^{11}(c+dx)(a+ia\,\mathrm{t}}{11d}$$
$$= -\frac{5ia^5\cos^7(c+dx)}{231d} - \frac{2ia^3\cos^9(c+dx)(a+ia\tan(c+dx))^2}{33d} - \frac{2ia\,\mathrm{c}}{}$$
$$= -\frac{5ia^5\cos^7(c+dx)}{231d} - \frac{2ia^3\cos^9(c+dx)(a+ia\tan(c+dx))^2}{33d} - \frac{2ia\,\mathrm{c}}{}$$
$$= -\frac{5ia^5\cos^7(c+dx)}{231d} + \frac{5a^5\sin(c+dx)}{33d} - \frac{5a^5\sin^3(c+dx)}{33d} + \frac{a^5\sin^5(}{11}$$

Mathematica [A] time = 1.43, size = 118, normalized size = 0.74

$$\frac{ia^5(330i\sin(2(c+dx))+616i\sin(4(c+dx))-126i\sin(6(c+dx))-825\cos(2(c+dx))-770\cos(4(c+dx))+}{7392d(\cos(dx)+i\sin(dx))^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^11*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] ((I/7392)*a^5*(-462 - 825*Cos[2*(c + d*x)] - 770*Cos[4*(c + d*x)] + 105*Cos
[6*(c + d*x)] + (330*I)*Sin[2*(c + d*x)] + (616*I)*Sin[4*(c + d*x)] - (126*
I)*Sin[6*(c + d*x)])*(Cos[5*(c + 2*d*x)] + I*Sin[5*(c + 2*d*x)]))/(d*(Cos[d
*x] + I*Sin[d*x])^5)
```

fricas [A] time = 0.48, size = 104, normalized size = 0.65

$$\frac{\left(-21i\,a^5e^{(12i\,dx+12i\,c)}-154i\,a^5e^{(10i\,dx+10i\,c)}-495i\,a^5e^{(8i\,dx+8i\,c)}-924i\,a^5e^{(6i\,dx+6i\,c)}-1155i\,a^5e^{(4i\,dx+4i\,c)}-1386i\,a^5}{14784\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^11*(a+I*a*tan(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] 1/14784*(-21*I*a^5*e^(12*I*d*x + 12*I*c) - 154*I*a^5*e^(10*I*d*x + 10*I*c)
- 495*I*a^5*e^(8*I*d*x + 8*I*c) - 924*I*a^5*e^(6*I*d*x + 6*I*c) - 1155*I*a^
5*e^(4*I*d*x + 4*I*c) - 1386*I*a^5*e^(2*I*d*x + 2*I*c) + 231*I*a^5)*e^(-I*d
*x - I*c)/d
```

giac [B] time = 6.91, size = 1807, normalized size = 11.36

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^11*(a+I*a*tan(d*x+c))^5,x, algorithm="giac")
```

```
[Out] -1/121110528*(168111405*a^5*e^(17*I*d*x + 9*I*c)*log(I*e^(I*d*x + I*c) + 1)
 + 1344891240*a^5*e^(15*I*d*x + 7*I*c)*log(I*e^(I*d*x + I*c) + 1) + 4707119
340*a^5*e^(13*I*d*x + 5*I*c)*log(I*e^(I*d*x + I*c) + 1) + 9414238680*a^5*e^
(11*I*d*x + 3*I*c)*log(I*e^(I*d*x + I*c) + 1) + 11767798350*a^5*e^(9*I*d*x
+ I*c)*log(I*e^(I*d*x + I*c) + 1) + 9414238680*a^5*e^(7*I*d*x - I*c)*log(I*
e^(I*d*x + I*c) + 1) + 4707119340*a^5*e^(5*I*d*x - 3*I*c)*log(I*e^(I*d*x +
I*c) + 1) + 1344891240*a^5*e^(3*I*d*x - 5*I*c)*log(I*e^(I*d*x + I*c) + 1) +
 168111405*a^5*e^(I*d*x - 7*I*c)*log(I*e^(I*d*x + I*c) + 1) + 170251620*a^5
*e^(17*I*d*x + 9*I*c)*log(I*e^(I*d*x + I*c) - 1) + 1362012960*a^5*e^(15*I*d
*x + 7*I*c)*log(I*e^(I*d*x + I*c) - 1) + 4767045360*a^5*e^(13*I*d*x + 5*I*c
)*log(I*e^(I*d*x + I*c) - 1) + 9534090720*a^5*e^(11*I*d*x + 3*I*c)*log(I*e^
```

```
(I*d*x + I*c) - 1) + 11917613400*a^5*e^(9*I*d*x + I*c)*log(I*e^(I*d*x + I*c
) - 1) + 9534090720*a^5*e^(7*I*d*x - I*c)*log(I*e^(I*d*x + I*c) - 1) + 4767
045360*a^5*e^(5*I*d*x - 3*I*c)*log(I*e^(I*d*x + I*c) - 1) + 1362012960*a^5*
e^(3*I*d*x - 5*I*c)*log(I*e^(I*d*x + I*c) - 1) + 170251620*a^5*e^(I*d*x - 7
*I*c)*log(I*e^(I*d*x + I*c) - 1) - 168111405*a^5*e^(17*I*d*x + 9*I*c)*log(-
I*e^(I*d*x + I*c) + 1) - 1344891240*a^5*e^(15*I*d*x + 7*I*c)*log(-I*e^(I*d*
x + I*c) + 1) - 4707119340*a^5*e^(13*I*d*x + 5*I*c)*log(-I*e^(I*d*x + I*c)
+ 1) - 9414238680*a^5*e^(11*I*d*x + 3*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 11
767798350*a^5*e^(9*I*d*x + I*c)*log(-I*e^(I*d*x + I*c) + 1) - 9414238680*a^
5*e^(7*I*d*x - I*c)*log(-I*e^(I*d*x + I*c) + 1) - 4707119340*a^5*e^(5*I*d*x
 - 3*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 1344891240*a^5*e^(3*I*d*x - 5*I*c)*
log(-I*e^(I*d*x + I*c) + 1) - 168111405*a^5*e^(I*d*x - 7*I*c)*log(-I*e^(I*d
*x + I*c) + 1) - 170251620*a^5*e^(17*I*d*x + 9*I*c)*log(-I*e^(I*d*x + I*c)
- 1) - 1362012960*a^5*e^(15*I*d*x + 7*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 47
67045360*a^5*e^(13*I*d*x + 5*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 9534090720*
a^5*e^(11*I*d*x + 3*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 11917613400*a^5*e^(9
*I*d*x + I*c)*log(-I*e^(I*d*x + I*c) - 1) - 9534090720*a^5*e^(7*I*d*x - I*c
)*log(-I*e^(I*d*x + I*c) - 1) - 4767045360*a^5*e^(5*I*d*x - 3*I*c)*log(-I*e
^(I*d*x + I*c) - 1) - 1362012960*a^5*e^(3*I*d*x - 5*I*c)*log(-I*e^(I*d*x +
I*c) - 1) - 170251620*a^5*e^(I*d*x - 7*I*c)*log(-I*e^(I*d*x + I*c) - 1) + 2
140215*a^5*e^(17*I*d*x + 9*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 17121720*a^5*
e^(15*I*d*x + 7*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 59926020*a^5*e^(13*I*d*x
 + 5*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 119852040*a^5*e^(11*I*d*x + 3*I*c)*
log(I*e^(I*d*x) + e^(-I*c)) + 149815050*a^5*e^(9*I*d*x + I*c)*log(I*e^(I*d*
x) + e^(-I*c)) + 119852040*a^5*e^(7*I*d*x - I*c)*log(I*e^(I*d*x) + e^(-I*c)
) + 59926020*a^5*e^(5*I*d*x - 3*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 17121720
*a^5*e^(3*I*d*x - 5*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 2140215*a^5*e^(I*d*x
 - 7*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 2140215*a^5*e^(17*I*d*x + 9*I*c)*lo
g(-I*e^(I*d*x) + e^(-I*c)) - 17121720*a^5*e^(15*I*d*x + 7*I*c)*log(-I*e^(I*
d*x) + e^(-I*c)) - 59926020*a^5*e^(13*I*d*x + 5*I*c)*log(-I*e^(I*d*x) + e^(
-I*c)) - 119852040*a^5*e^(11*I*d*x + 3*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) -
149815050*a^5*e^(9*I*d*x + I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 119852040*a^
5*e^(7*I*d*x - I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 59926020*a^5*e^(5*I*d*x
- 3*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 17121720*a^5*e^(3*I*d*x - 5*I*c)*lo
g(-I*e^(I*d*x) + e^(-I*c)) - 2140215*a^5*e^(I*d*x - 7*I*c)*log(-I*e^(I*d*x)
 + e^(-I*c)) + 172032*I*a^5*e^(28*I*d*x + 20*I*c) + 2637824*I*a^5*e^(26*I*d
*x + 18*I*c) + 18964480*I*a^5*e^(24*I*d*x + 16*I*c) + 84967424*I*a^5*e^(22*
I*d*x + 14*I*c) + 266248192*I*a^5*e^(20*I*d*x + 12*I*c) + 624017408*I*a^5*e
^(18*I*d*x + 10*I*c) + 1137074176*I*a^5*e^(16*I*d*x + 8*I*c) + 1626275840*I
*a^5*e^(14*I*d*x + 6*I*c) + 1792860160*I*a^5*e^(12*I*d*x + 4*I*c) + 1464320
000*I*a^5*e^(10*I*d*x + 2*I*c) + 295206912*I*a^5*e^(6*I*d*x - 2*I*c) + 4730
8800*I*a^5*e^(4*I*d*x - 4*I*c) - 3784704*I*a^5*e^(2*I*d*x - 6*I*c) + 832905
216*I*a^5*e^(8*I*d*x) - 1892352*I*a^5*e^(-8*I*c))/(d*e^(17*I*d*x + 9*I*c) +
 8*d*e^(15*I*d*x + 7*I*c) + 28*d*e^(13*I*d*x + 5*I*c) + 56*d*e^(11*I*d*x +
3*I*c) + 70*d*e^(9*I*d*x + I*c) + 56*d*e^(7*I*d*x - I*c) + 28*d*e^(5*I*d*x
- 3*I*c) + 8*d*e^(3*I*d*x - 5*I*c) + d*e^(I*d*x - 7*I*c))
```

maple [B] time = 0.60, size = 317, normalized size = 1.99

$$ia^5\left(-\frac{\left(\sin^4(dx+c)\right)\left(\cos^7(dx+c)\right)}{11}-\frac{4\left(\sin^2(dx+c)\right)\left(\cos^7(dx+c)\right)}{99}-\frac{8\left(\cos^7(dx+c)\right)}{693}\right)+5a^5\left(-\frac{\left(\sin^3(dx+c)\right)\left(\cos^8(dx+c)\right)}{11}-\frac{\sin(dx+c)\left(\cos^8(dx+c\right.}{33}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^11*(a+I*a*tan(d*x+c))^5,x)
```

```
[Out] 1/d*(I*a^5*(-1/11*sin(d*x+c)^4*cos(d*x+c)^7-4/99*sin(d*x+c)^2*cos(d*x+c)^7-
8/693*cos(d*x+c)^7)+5*a^5*(-1/11*sin(d*x+c)^3*cos(d*x+c)^8-1/33*sin(d*x+c)*
```

```
cos(d*x+c)^8+1/231*(16/5+cos(d*x+c)^6+6/5*cos(d*x+c)^4+8/5*cos(d*x+c)^2)*si
n(d*x+c))-10*I*a^5*(-1/11*sin(d*x+c)^2*cos(d*x+c)^9-2/99*cos(d*x+c)^9)-10*a
^5*(-1/11*sin(d*x+c)*cos(d*x+c)^10+1/99*(128/35+cos(d*x+c)^8+8/7*cos(d*x+c)
^6+48/35*cos(d*x+c)^4+64/35*cos(d*x+c)^2)*sin(d*x+c))-5/11*I*a^5*cos(d*x+c)
^11+1/11*a^5*(256/63+cos(d*x+c)^10+10/9*cos(d*x+c)^8+80/63*cos(d*x+c)^6+32/
21*cos(d*x+c)^4+128/63*cos(d*x+c)^2)*sin(d*x+c))
```

maxima [A] time = 0.48, size = 246, normalized size = 1.55

$$-\frac{315i\,a^5\cos\left(dx+c\right)^{11}+i\left(63\,\cos\left(dx+c\right)^{11}-154\,\cos\left(dx+c\right)^{9}+99\,\cos\left(dx+c\right)^{7}\right)a^5+70i\left(9\,\cos\left(dx+c\right)^{11}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^11*(a+I*a*tan(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] -1/693*(315*I*a^5*cos(d*x + c)^11 + I*(63*cos(d*x + c)^11 - 154*cos(d*x + c
)^9 + 99*cos(d*x + c)^7)*a^5 + 70*I*(9*cos(d*x + c)^11 - 11*cos(d*x + c)^9)
*a^5 + 2*(315*sin(d*x + c)^11 - 1540*sin(d*x + c)^9 + 2970*sin(d*x + c)^7 -
 2772*sin(d*x + c)^5 + 1155*sin(d*x + c)^3)*a^5 + 3*(105*sin(d*x + c)^11 -
385*sin(d*x + c)^9 + 495*sin(d*x + c)^7 - 231*sin(d*x + c)^5)*a^5 + (63*sin
(d*x + c)^11 - 385*sin(d*x + c)^9 + 990*sin(d*x + c)^7 - 1386*sin(d*x + c)^
5 + 1155*sin(d*x + c)^3 - 693*sin(d*x + c))*a^5)/d
```

mupad [B] time = 4.60, size = 139, normalized size = 0.87

$$\frac{a^5\left(\frac{5\,\sin(3\,c+3\,d\,x)}{64}-\frac{\cos(5\,c+5\,d\,x)\,1\mathrm{i}}{16}-\frac{\cos(7\,c+7\,d\,x)\,15\mathrm{i}}{448}-\frac{\cos(9\,c+9\,d\,x)\,1\mathrm{i}}{96}-\frac{\cos(11\,c+11\,d\,x)\,1\mathrm{i}}{704}-\frac{\cos(3\,c+3\,d\,x)\,5\mathrm{i}}{64}+\frac{\sin(5\,c+5\,d\,x)}{16}+\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^11*(a + a*tan(c + d*x)*1i)^5,x)
```

```
[Out] (a^5*((5*sin(3*c + 3*d*x))/64 - (cos(5*c + 5*d*x)*1i)/16 - (cos(7*c + 7*d*x
)*15i)/448 - (cos(9*c + 9*d*x)*1i)/96 - (cos(11*c + 11*d*x)*1i)/704 - (cos(
3*c + 3*d*x)*5i)/64 + sin(5*c + 5*d*x)/16 + (15*sin(7*c + 7*d*x))/448 + sin
(9*c + 9*d*x)/96 + sin(11*c + 11*d*x)/704 + (24^(1/2)*cos(c - atanh(7/5)*1i
 + d*x))/64))/d
```

sympy [A] time = 0.98, size = 269, normalized size = 1.69

$$\begin{cases}-\frac{\left(90194313216ia^5d^6e^{12ic}e^{11idx}+661424963584ia^5d^6e^{10ic}e^{9idx}+2126008811520ia^5d^6e^{8ic}e^{7idx}+3968549781504ia^5d^6e^{6ic}e^{5idx}+4960687226880ia^5\right.}{63496796504064d^7} \\ \frac{x\left(a^5e^{12ic}+6a^5e^{10ic}+15a^5e^{8ic}+20a^5e^{6ic}+15a^5e^{4ic}+6a^5e^{2ic}+a^5\right)e^{-ic}}{64}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**11*(a+I*a*tan(d*x+c))**5,x)
```

```
[Out] Piecewise((-(90194313216*I*a**5*d**6*exp(12*I*c)*exp(11*I*d*x) + 6614249635
84*I*a**5*d**6*exp(10*I*c)*exp(9*I*d*x) + 2126008811520*I*a**5*d**6*exp(8*I
*c)*exp(7*I*d*x) + 3968549781504*I*a**5*d**6*exp(6*I*c)*exp(5*I*d*x) + 4960
687226880*I*a**5*d**6*exp(4*I*c)*exp(3*I*d*x) + 5952824672256*I*a**5*d**6*e
xp(2*I*c)*exp(I*d*x) - 992137445376*I*a**5*d**6*exp(-I*d*x))*exp(-I*c)/(634
96796504064*d**7), Ne(63496796504064*d**7*exp(I*c), 0)), (x*(a**5*exp(12*I*
c) + 6*a**5*exp(10*I*c) + 15*a**5*exp(8*I*c) + 20*a**5*exp(6*I*c) + 15*a**5
*exp(4*I*c) + 6*a**5*exp(2*I*c) + a**5)*exp(-I*c)/64, True))
```

3.77 $\int \sec^8(c+dx)(a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=109

$$\frac{i(a+ia\tan(c+dx))^{15}}{15a^7d}-\frac{3i(a+ia\tan(c+dx))^{14}}{7a^6d}+\frac{12i(a+ia\tan(c+dx))^{13}}{13a^5d}-\frac{2i(a+ia\tan(c+dx))^{12}}{3a^4d}$$

```
[Out] -2/3*I*(a+I*a*tan(d*x+c))^12/a^4/d+12/13*I*(a+I*a*tan(d*x+c))^13/a^5/d-3/7*
I*(a+I*a*tan(d*x+c))^14/a^6/d+1/15*I*(a+I*a*tan(d*x+c))^15/a^7/d
```

Rubi [A] time = 0.08, antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{i(a+ia\tan(c+dx))^{15}}{15a^7d}-\frac{3i(a+ia\tan(c+dx))^{14}}{7a^6d}+\frac{12i(a+ia\tan(c+dx))^{13}}{13a^5d}-\frac{2i(a+ia\tan(c+dx))^{12}}{3a^4d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^8*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (((-2*I)/3)*(a + I*a*Tan[c + d*x])^12)/(a^4*d) + (((12*I)/13)*(a + I*a*Tan[
c + d*x])^13)/(a^5*d) - (((3*I)/7)*(a + I*a*Tan[c + d*x])^14)/(a^6*d) + ((I
/15)*(a + I*a*Tan[c + d*x])^15)/(a^7*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^8(c+dx)(a+ia\tan(c+dx))^8\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^3(a+x)^{11}\,dx, x, ia\tan(c+dx)\right)}{a^7d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(8a^3(a+x)^{11}-12a^2(a+x)^{12}+6a(a+x)^{13}-(a+x)^{14}\right) dx\right.}{a^7d}\\ &= -\frac{2i(a+ia\tan(c+dx))^{12}}{3a^4d}+\frac{12i(a+ia\tan(c+dx))^{13}}{13a^5d}-\frac{3i(a+ia\tan(c\right.}{7a^6d}\end{aligned}$$

Mathematica [B] time = 9.50, size = 245, normalized size = 2.25

$$\frac{a^8\sec(c)\sec^{15}(c+dx)(-6435\sin(2c+dx)+5005\sin(2c+3dx)-5005\sin(4c+3dx)+3003\sin(4c+5dx)-30}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^8*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (a^8*Sec[c]*Sec[c + d*x]^15*((6435*I)*Cos[d*x] + (6435*I)*Cos[2*c + d*x] +
(5005*I)*Cos[2*c + 3*d*x] + (5005*I)*Cos[4*c + 3*d*x] + (3003*I)*Cos[4*c +
5*d*x] + (3003*I)*Cos[6*c + 5*d*x] + (1365*I)*Cos[6*c + 7*d*x] + (1365*I)*C
os[8*c + 7*d*x] + 6435*Sin[d*x] - 6435*Sin[2*c + d*x] + 5005*Sin[2*c + 3*d*
x] - 5005*Sin[4*c + 3*d*x] + 3003*Sin[4*c + 5*d*x] - 3003*Sin[6*c + 5*d*x]
+ 1365*Sin[6*c + 7*d*x] - 1365*Sin[8*c + 7*d*x] + 910*Sin[8*c + 9*d*x] + 21
0*Sin[10*c + 11*d*x] + 30*Sin[12*c + 13*d*x] + 2*Sin[14*c + 15*d*x]))/(1092
0*d)
```

fricas [B] time = 0.66, size = 345, normalized size = 3.17

$$\frac{11182080i\,a^8e^{(22i\,dx+22i\,c)} + 24600576i\,a^8e^{(20i\,dx+20i\,c)} + 41000960i\,a^8e^{(18i\,dx+18i\,c)} + 52715520i\,a^8e^{(16i\,dx+16i\,c)} + \cdots}{1365\left(de^{(30i\,dx+30i\,c)} + 15\,de^{(28i\,dx+28i\,c)} + 105\,de^{(26i\,dx+26i\,c)} + 455\,de^{(24i\,dx+24i\,c)} + 1365\,de^{(22i\,dx+22i\,c)} + 3003\,de^{(20i\cdots}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/1365*(11182080*I*a^8*e^(22*I*d*x + 22*I*c) + 24600576*I*a^8*e^(20*I*d*x +
 20*I*c) + 41000960*I*a^8*e^(18*I*d*x + 18*I*c) + 52715520*I*a^8*e^(16*I*d*
x + 16*I*c) + 52715520*I*a^8*e^(14*I*d*x + 14*I*c) + 41000960*I*a^8*e^(12*I
*d*x + 12*I*c) + 24600576*I*a^8*e^(10*I*d*x + 10*I*c) + 11182080*I*a^8*e^(8
*I*d*x + 8*I*c) + 3727360*I*a^8*e^(6*I*d*x + 6*I*c) + 860160*I*a^8*e^(4*I*d
*x + 4*I*c) + 122880*I*a^8*e^(2*I*d*x + 2*I*c) + 8192*I*a^8)/(d*e^(30*I*d*x
 + 30*I*c) + 15*d*e^(28*I*d*x + 28*I*c) + 105*d*e^(26*I*d*x + 26*I*c) + 455
*d*e^(24*I*d*x + 24*I*c) + 1365*d*e^(22*I*d*x + 22*I*c) + 3003*d*e^(20*I*d*
x + 20*I*c) + 5005*d*e^(18*I*d*x + 18*I*c) + 6435*d*e^(16*I*d*x + 16*I*c) +
 6435*d*e^(14*I*d*x + 14*I*c) + 5005*d*e^(12*I*d*x + 12*I*c) + 3003*d*e^(10
*I*d*x + 10*I*c) + 1365*d*e^(8*I*d*x + 8*I*c) + 455*d*e^(6*I*d*x + 6*I*c) +
 105*d*e^(4*I*d*x + 4*I*c) + 15*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [B] time = 5.28, size = 186, normalized size = 1.71

$$\frac{91\,a^8\tan\left(dx+c\right)^{15} - 780i\,a^8\tan\left(dx+c\right)^{14} - 2625\,a^8\tan\left(dx+c\right)^{13} + 3640i\,a^8\tan\left(dx+c\right)^{12} - 1365\,a^8\tan\left(d\cdots\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/1365*(91*a^8*tan(d*x + c)^15 - 780*I*a^8*tan(d*x + c)^14 - 2625*a^8*tan(d
*x + c)^13 + 3640*I*a^8*tan(d*x + c)^12 - 1365*a^8*tan(d*x + c)^11 + 12012*
I*a^8*tan(d*x + c)^10 + 15015*a^8*tan(d*x + c)^9 + 19305*a^8*tan(d*x + c)^7
 - 20020*I*a^8*tan(d*x + c)^6 - 3003*a^8*tan(d*x + c)^5 - 10920*I*a^8*tan(d
*x + c)^4 - 11375*a^8*tan(d*x + c)^3 + 5460*I*a^8*tan(d*x + c)^2 + 1365*a^8
*tan(d*x + c))/d
```

maple [B] time = 0.55, size = 611, normalized size = 5.61

$$\frac{a^8\left(\frac{\sin^9(dx+c)}{15\cos(dx+c)^{15}} + \frac{2\left(\sin^9(dx+c)\right)}{65\cos(dx+c)^{13}} + \frac{8\left(\sin^9(dx+c)\right)}{715\cos(dx+c)^{11}} + \frac{16\left(\sin^9(dx+c)\right)}{6435\cos(dx+c)^9}\right) + \frac{ia^8}{\cos(dx+c)^8} - 28a^8\left(\frac{\sin^7(dx+c)}{13\cos(dx+c)^{13}} + \frac{6\left(\sin^7(dx+c)\right)}{143\cos(dx+c)^{11}}\cdots\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/d*(a^8*(1/15*sin(d*x+c)^9/cos(d*x+c)^15+2/65*sin(d*x+c)^9/cos(d*x+c)^13+8
/715*sin(d*x+c)^9/cos(d*x+c)^11+16/6435*sin(d*x+c)^9/cos(d*x+c)^9)+I*a^8/co
s(d*x+c)^8-28*a^8*(1/13*sin(d*x+c)^7/cos(d*x+c)^13+6/143*sin(d*x+c)^7/cos(d
*x+c)^11+8/429*sin(d*x+c)^7/cos(d*x+c)^9+16/3003*sin(d*x+c)^7/cos(d*x+c)^7)
-8*I*a^8*(1/14*sin(d*x+c)^8/cos(d*x+c)^14+1/28*sin(d*x+c)^8/cos(d*x+c)^12+1
```

```
/70*sin(d*x+c)^8/cos(d*x+c)^10+1/280*sin(d*x+c)^8/cos(d*x+c)^8)+70*a^8*(1/1
1*sin(d*x+c)^5/cos(d*x+c)^11+2/33*sin(d*x+c)^5/cos(d*x+c)^9+8/231*sin(d*x+c
)^5/cos(d*x+c)^7+16/1155*sin(d*x+c)^5/cos(d*x+c)^5)+56*I*a^8*(1/12*sin(d*x+
c)^6/cos(d*x+c)^12+1/20*sin(d*x+c)^6/cos(d*x+c)^10+1/40*sin(d*x+c)^6/cos(d*
x+c)^8+1/120*sin(d*x+c)^6/cos(d*x+c)^6)-28*a^8*(1/9*sin(d*x+c)^3/cos(d*x+c)
^9+2/21*sin(d*x+c)^3/cos(d*x+c)^7+8/105*sin(d*x+c)^3/cos(d*x+c)^5+16/315*si
n(d*x+c)^3/cos(d*x+c)^3)-56*I*a^8*(1/10*sin(d*x+c)^4/cos(d*x+c)^10+3/40*sin
(d*x+c)^4/cos(d*x+c)^8+1/20*sin(d*x+c)^4/cos(d*x+c)^6+1/40*sin(d*x+c)^4/cos
(d*x+c)^4)-a^8*(-16/35-1/7*sec(d*x+c)^6-6/35*sec(d*x+c)^4-8/35*sec(d*x+c)^2
)*tan(d*x+c))
```

maxima [B] time = 0.32, size = 186, normalized size = 1.71

$$\frac{3003\,a^8\tan(dx+c)^{15} - 25740i\,a^8\tan(dx+c)^{14} - 86625\,a^8\tan(dx+c)^{13} + 120120i\,a^8\tan(dx+c)^{12} - 45045\,a^8}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] 1/45045*(3003*a^8*tan(d*x + c)^15 - 25740*I*a^8*tan(d*x + c)^14 - 86625*a^8
*tan(d*x + c)^13 + 120120*I*a^8*tan(d*x + c)^12 - 45045*a^8*tan(d*x + c)^11
 + 396396*I*a^8*tan(d*x + c)^10 + 495495*a^8*tan(d*x + c)^9 + 637065*a^8*ta
n(d*x + c)^7 - 660660*I*a^8*tan(d*x + c)^6 - 99099*a^8*tan(d*x + c)^5 - 360
360*I*a^8*tan(d*x + c)^4 - 375375*a^8*tan(d*x + c)^3 + 180180*I*a^8*tan(d*x
 + c)^2 + 45045*a^8*tan(d*x + c))/d
```

mupad [B] time = 4.83, size = 153, normalized size = 1.40

$$\frac{a^8\left(\frac{\sin(9\,c+9\,d\,x)}{12}+\frac{\sin(11\,c+11\,d\,x)}{52}+\frac{\sin(13\,c+13\,d\,x)}{364}+\frac{\sin(15\,c+15\,d\,x)}{5460}+\frac{\cos(c+d\,x)\,297\mathrm{i}}{7168}+\frac{\cos(3\,c+3\,d\,x)\,33\mathrm{i}}{1024}+\frac{\cos(5\,c+5\,d\,x)\,99\mathrm{i}}{5120}+\cos\right.}{d\cos\left(c+d\,x\right)^{15}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^8/cos(c + d*x)^8,x)
```

```
[Out] (a^8*((cos(c + d*x)*297i)/7168 + (cos(3*c + 3*d*x)*33i)/1024 + (cos(5*c + 5
*d*x)*99i)/5120 + (cos(7*c + 7*d*x)*9i)/1024 - (cos(9*c + 9*d*x)*247i)/3072
 - (cos(11*c + 11*d*x)*19i)/1024 - (cos(13*c + 13*d*x)*19i)/7168 - (cos(15*
c + 15*d*x)*19i)/107520 + sin(9*c + 9*d*x)/12 + sin(11*c + 11*d*x)/52 + sin
(13*c + 13*d*x)/364 + sin(15*c + 15*d*x)/5460))/(d*cos(c + d*x)^15)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8*(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Timed out
```

3.78 $\int \sec^6(c+dx)(a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=82

$$-\frac{i(a+ia\tan(c+dx))^{13}}{13a^5d}+\frac{i(a+ia\tan(c+dx))^{12}}{3a^4d}-\frac{4i(a+ia\tan(c+dx))^{11}}{11a^3d}$$

```
[Out] -4/11*I*(a+I*a*tan(d*x+c))^11/a^3/d+1/3*I*(a+I*a*tan(d*x+c))^12/a^4/d-1/13*
I*(a+I*a*tan(d*x+c))^13/a^5/d
```

Rubi [A] time = 0.07, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$-\frac{i(a+ia\tan(c+dx))^{13}}{13a^5d}+\frac{i(a+ia\tan(c+dx))^{12}}{3a^4d}-\frac{4i(a+ia\tan(c+dx))^{11}}{11a^3d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (((-4*I)/11)*(a + I*a*Tan[c + d*x])^11)/(a^3*d) + ((I/3)*(a + I*a*Tan[c + d
*x])^12)/(a^4*d) - ((I/13)*(a + I*a*Tan[c + d*x])^13)/(a^5*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^6(c+dx)(a+ia\tan(c+dx))^8\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^2(a+x)^{10}\,dx, x, ia\tan(c+dx)\right)}{a^5d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(4a^2(a+x)^{10}-4a(a+x)^{11}+(a+x)^{12}\right)dx, x, ia\tan(c+\right.}{a^5d}\\ &= -\frac{4i(a+ia\tan(c+dx))^{11}}{11a^3d}+\frac{i(a+ia\tan(c+dx))^{12}}{3a^4d}-\frac{i(a+ia\tan(c+}{13a^5d}\end{aligned}$$

Mathematica [B] time = 7.04, size = 234, normalized size = 2.85

$$\frac{a^8\sec(c)\sec^{13}(c+dx)(-1716\sin(2c+dx)+1287\sin(2c+3dx)-1287\sin(4c+3dx)+715\sin(4c+5dx)-7}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (a^8*Sec[c]*Sec[c + d*x]^13*((1716*I)*Cos[d*x] + (1716*I)*Cos[2*c + d*x] +
(1287*I)*Cos[2*c + 3*d*x] + (1287*I)*Cos[4*c + 3*d*x] + (715*I)*Cos[4*c + 5
```

```
*d*x] + (715*I)*Cos[6*c + 5*d*x] + (286*I)*Cos[6*c + 7*d*x] + (286*I)*Cos[8
*c + 7*d*x] + 1716*Sin[d*x] - 1716*Sin[2*c + d*x] + 1287*Sin[2*c + 3*d*x] -
 1287*Sin[4*c + 3*d*x] + 715*Sin[4*c + 5*d*x] - 715*Sin[6*c + 5*d*x] + 286*
Sin[6*c + 7*d*x] - 286*Sin[8*c + 7*d*x] + 156*Sin[8*c + 9*d*x] + 26*Sin[10*
c + 11*d*x] + 2*Sin[12*c + 13*d*x]))/(1716*d)
```

fricas [B] time = 0.47, size = 307, normalized size = 3.74

$$\frac{1171456i\,a^8e^{(20i\,dx+20i\,c)} + 2928640i\,a^8e^{(18i\,dx+18i\,c)} + 5271552i\,a^8e^{(16i\,dx+16i\,c)} + 7028736i\,a^8e^{(14i\,dx+14i\,c)} + 7028736}{429\left(de^{(26i\,dx+26i\,c)} + 13\,de^{(24i\,dx+24i\,c)} + 78\,de^{(22i\,dx+22i\,c)} + 286\,de^{(20i\,dx+20i\,c)} + 715\,de^{(18i\,dx+18i\,c)} + 1287\,de^{(16i\,dx}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/429*(1171456*I*a^8*e^(20*I*d*x + 20*I*c) + 2928640*I*a^8*e^(18*I*d*x + 18
*I*c) + 5271552*I*a^8*e^(16*I*d*x + 16*I*c) + 7028736*I*a^8*e^(14*I*d*x + 1
4*I*c) + 7028736*I*a^8*e^(12*I*d*x + 12*I*c) + 5271552*I*a^8*e^(10*I*d*x +
10*I*c) + 2928640*I*a^8*e^(8*I*d*x + 8*I*c) + 1171456*I*a^8*e^(6*I*d*x + 6*
I*c) + 319488*I*a^8*e^(4*I*d*x + 4*I*c) + 53248*I*a^8*e^(2*I*d*x + 2*I*c) +
 4096*I*a^8)/(d*e^(26*I*d*x + 26*I*c) + 13*d*e^(24*I*d*x + 24*I*c) + 78*d*e
^(22*I*d*x + 22*I*c) + 286*d*e^(20*I*d*x + 20*I*c) + 715*d*e^(18*I*d*x + 18
*I*c) + 1287*d*e^(16*I*d*x + 16*I*c) + 1716*d*e^(14*I*d*x + 14*I*c) + 1716*
d*e^(12*I*d*x + 12*I*c) + 1287*d*e^(10*I*d*x + 10*I*c) + 715*d*e^(8*I*d*x +
 8*I*c) + 286*d*e^(6*I*d*x + 6*I*c) + 78*d*e^(4*I*d*x + 4*I*c) + 13*d*e^(2*
I*d*x + 2*I*c) + d)
```

giac [B] time = 4.33, size = 173, normalized size = 2.11

$$\frac{33\,a^8\tan\left(dx+c\right)^{13} - 286i\,a^8\tan\left(dx+c\right)^{12} - 1014\,a^8\tan\left(dx+c\right)^{11} + 1716i\,a^8\tan\left(dx+c\right)^{10} + 715\,a^8\tan\left(dx+c\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/429*(33*a^8*tan(d*x + c)^13 - 286*I*a^8*tan(d*x + c)^12 - 1014*a^8*tan(d*
x + c)^11 + 1716*I*a^8*tan(d*x + c)^10 + 715*a^8*tan(d*x + c)^9 + 2574*I*a^
8*tan(d*x + c)^8 + 5148*a^8*tan(d*x + c)^7 - 3432*I*a^8*tan(d*x + c)^6 + 12
87*a^8*tan(d*x + c)^5 - 4290*I*a^8*tan(d*x + c)^4 - 3718*a^8*tan(d*x + c)^3
 + 1716*I*a^8*tan(d*x + c)^2 + 429*a^8*tan(d*x + c))/d
```

maple [B] time = 0.53, size = 475, normalized size = 5.79

$$\frac{a^8\left(\frac{\sin^9(dx+c)}{13\cos(dx+c)^{13}} + \frac{4\left(\sin^9(dx+c)\right)}{143\cos(dx+c)^{11}} + \frac{8\left(\sin^9(dx+c)\right)}{1287\cos(dx+c)^9}\right) + \frac{4ia^8}{3\cos(dx+c)^6} - 28a^8\left(\frac{\sin^7(dx+c)}{11\cos(dx+c)^{11}} + \frac{4\left(\sin^7(dx+c)\right)}{99\cos(dx+c)^9} + \frac{8\left(\sin^7(dx+c)\right)}{693\cos(dx+c)^7}\right) -}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/d*(a^8*(1/13*sin(d*x+c)^9/cos(d*x+c)^13+4/143*sin(d*x+c)^9/cos(d*x+c)^11+
8/1287*sin(d*x+c)^9/cos(d*x+c)^9)+4/3*I*a^8/cos(d*x+c)^6-28*a^8*(1/11*sin(d
*x+c)^7/cos(d*x+c)^11+4/99*sin(d*x+c)^7/cos(d*x+c)^9+8/693*sin(d*x+c)^7/cos
(d*x+c)^7)-56*I*a^8*(1/8*sin(d*x+c)^4/cos(d*x+c)^8+1/12*sin(d*x+c)^4/cos(d*
x+c)^6+1/24*sin(d*x+c)^4/cos(d*x+c)^4)+70*a^8*(1/9*sin(d*x+c)^5/cos(d*x+c)^
9+4/63*sin(d*x+c)^5/cos(d*x+c)^7+8/315*sin(d*x+c)^5/cos(d*x+c)^5)+56*I*a^8*
(1/10*sin(d*x+c)^6/cos(d*x+c)^10+1/20*sin(d*x+c)^6/cos(d*x+c)^8+1/60*sin(d*
x+c)^6/cos(d*x+c)^6)-28*a^8*(1/7*sin(d*x+c)^3/cos(d*x+c)^7+4/35*sin(d*x+c)^
3/cos(d*x+c)^5+8/105*sin(d*x+c)^3/cos(d*x+c)^3)-8*I*a^8*(1/12*sin(d*x+c)^8/
```

```
cos(d*x+c)^12+1/30*sin(d*x+c)^8/cos(d*x+c)^10+1/120*sin(d*x+c)^8/cos(d*x+c)
^8)-a^8*(-8/15-1/5*sec(d*x+c)^4-4/15*sec(d*x+c)^2)*tan(d*x+c))
```

maxima [B] time = 0.40, size = 173, normalized size = 2.11

$$\frac{495\,a^8\tan(dx+c)^{13} - 4290i\,a^8\tan(dx+c)^{12} - 15210\,a^8\tan(dx+c)^{11} + 25740i\,a^8\tan(dx+c)^{10} + 10725\,a^8}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] 1/6435*(495*a^8*tan(d*x + c)^13 - 4290*I*a^8*tan(d*x + c)^12 - 15210*a^8*ta
n(d*x + c)^11 + 25740*I*a^8*tan(d*x + c)^10 + 10725*a^8*tan(d*x + c)^9 + 38
610*I*a^8*tan(d*x + c)^8 + 77220*a^8*tan(d*x + c)^7 - 51480*I*a^8*tan(d*x +
 c)^6 + 19305*a^8*tan(d*x + c)^5 - 64350*I*a^8*tan(d*x + c)^4 - 55770*a^8*t
an(d*x + c)^3 + 25740*I*a^8*tan(d*x + c)^2 + 6435*a^8*tan(d*x + c))/d
```

mupad [B] time = 5.34, size = 190, normalized size = 2.32

$$\frac{a^8\,\sin(c+d\,x)\,\left(2\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-1\right)\,\left(-184\sin(c+d\,x)^2-184\sin(2\,c+2\,d\,x)^2+\frac{\sin(2\,c+2\,d\,x)\,9867\mathrm{i}}{256}-184\sin(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^8/cos(c + d*x)^6,x)
```

```
[Out] (a^8*sin(c + d*x)*(2*sin(c/2 + (d*x)/2)^2 - 1)*((sin(2*c + 2*d*x)*9867i)/25
6 + (sin(4*c + 4*d*x)*69069i)/1024 + (sin(6*c + 6*d*x)*42757i)/512 + (sin(8
*c + 8*d*x)*23023i)/256 + (sin(10*c + 10*d*x)*7007i)/512 + (sin(12*c + 12*d
*x)*1001i)/1024 - 184*sin(2*c + 2*d*x)^2 - 184*sin(3*c + 3*d*x)^2 - 184*sin
(4*c + 4*d*x)^2 - 28*sin(5*c + 5*d*x)^2 - 2*sin(6*c + 6*d*x)^2 - 184*sin(c
+ d*x)^2 + 429))/(429*d*(sin(c + d*x)^2 - 1)^7)
```

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

$$a^8\left(\int\left(-28\tan^2(c+dx)\sec^6(c+dx)\right)dx+\int 70\tan^4(c+dx)\sec^6(c+dx)\,dx+\int\left(-28\tan^6(c+dx)\sec^6(\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6*(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] a**8*(Integral(-28*tan(c + d*x)**2*sec(c + d*x)**6, x) + Integral(70*tan(c
+ d*x)**4*sec(c + d*x)**6, x) + Integral(-28*tan(c + d*x)**6*sec(c + d*x)**
6, x) + Integral(tan(c + d*x)**8*sec(c + d*x)**6, x) + Integral(8*I*tan(c +
 d*x)*sec(c + d*x)**6, x) + Integral(-56*I*tan(c + d*x)**3*sec(c + d*x)**6,
 x) + Integral(56*I*tan(c + d*x)**5*sec(c + d*x)**6, x) + Integral(-8*I*tan
(c + d*x)**7*sec(c + d*x)**6, x) + Integral(sec(c + d*x)**6, x))
```

3.79 $\int \sec^4(c+dx)(a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=55

$$\frac{i(a+ia\tan(c+dx))^{11}}{11a^3d}-\frac{i(a+ia\tan(c+dx))^{10}}{5a^2d}$$

```
[Out] -1/5*I*(a+I*a*tan(d*x+c))^10/a^2/d+1/11*I*(a+I*a*tan(d*x+c))^11/a^3/d
```

Rubi [A] time = 0.05, antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{i(a+ia\tan(c+dx))^{11}}{11a^3d}-\frac{i(a+ia\tan(c+dx))^{10}}{5a^2d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((-I/5)*(a + I*a*Tan[c + d*x])^10)/(a^2*d) + ((I/11)*(a + I*a*Tan[c + d*x])
^11)/(a^3*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^4(c+dx)(a+ia\tan(c+dx))^8\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)(a+x)^9\,dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(2a(a+x)^9-(a+x)^{10}\right)dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{i(a+ia\tan(c+dx))^{10}}{5a^2d}+\frac{i(a+ia\tan(c+dx))^{11}}{11a^3d}\end{aligned}$$

Mathematica [B] time = 4.94, size = 223, normalized size = 4.05

$$\frac{a^8\sec(c)\sec^{11}(c+dx)(-462\sin(2c+dx)+330\sin(2c+3dx)-330\sin(4c+3dx)+165\sin(4c+5dx)-165\sin}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (a^8*Sec[c]*Sec[c + d*x]^11*((462*I)*Cos[d*x] + (462*I)*Cos[2*c + d*x] + (3
30*I)*Cos[2*c + 3*d*x] + (330*I)*Cos[4*c + 3*d*x] + (165*I)*Cos[4*c + 5*d*x
] + (165*I)*Cos[6*c + 5*d*x] + (55*I)*Cos[6*c + 7*d*x] + (55*I)*Cos[8*c + 7
```

```
*d*x] + 462*Sin[d*x] - 462*Sin[2*c + d*x] + 330*Sin[2*c + 3*d*x] - 330*Sin[
4*c + 3*d*x] + 165*Sin[4*c + 5*d*x] - 165*Sin[6*c + 5*d*x] + 55*Sin[6*c + 7
*d*x] - 55*Sin[8*c + 7*d*x] + 22*Sin[8*c + 9*d*x] + 2*Sin[10*c + 11*d*x]))/
(220*d)
```

fricas [B] time = 0.44, size = 269, normalized size = 4.89

$$\frac{56320i\,a^8e^{(18i\,dx+18i\,c)} + 168960i\,a^8e^{(16i\,dx+16i\,c)} + 337920i\,a^8e^{(14i\,dx+14i\,c)} + 473088i\,a^8e^{(12i\,dx+12i\,c)} + 473088i\,a^8e}{55\left(de^{(22i\,dx+22i\,c)} + 11\,de^{(20i\,dx+20i\,c)} + 55\,de^{(18i\,dx+18i\,c)} + 165\,de^{(16i\,dx+16i\,c)} + 330\,de^{(14i\,dx+14i\,c)} + 462\,de\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/55*(56320*I*a^8*e^(18*I*d*x + 18*I*c) + 168960*I*a^8*e^(16*I*d*x + 16*I*c
) + 337920*I*a^8*e^(14*I*d*x + 14*I*c) + 473088*I*a^8*e^(12*I*d*x + 12*I*c)
 + 473088*I*a^8*e^(10*I*d*x + 10*I*c) + 337920*I*a^8*e^(8*I*d*x + 8*I*c) +
168960*I*a^8*e^(6*I*d*x + 6*I*c) + 56320*I*a^8*e^(4*I*d*x + 4*I*c) + 11264*
I*a^8*e^(2*I*d*x + 2*I*c) + 1024*I*a^8)/(d*e^(22*I*d*x + 22*I*c) + 11*d*e^(
20*I*d*x + 20*I*c) + 55*d*e^(18*I*d*x + 18*I*c) + 165*d*e^(16*I*d*x + 16*I*
c) + 330*d*e^(14*I*d*x + 14*I*c) + 462*d*e^(12*I*d*x + 12*I*c) + 462*d*e^(1
0*I*d*x + 10*I*c) + 330*d*e^(8*I*d*x + 8*I*c) + 165*d*e^(6*I*d*x + 6*I*c) +
 55*d*e^(4*I*d*x + 4*I*c) + 11*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [B] time = 3.56, size = 134, normalized size = 2.44

$$\frac{5\,a^8\tan\left(dx+c\right)^{11} - 44i\,a^8\tan\left(dx+c\right)^{10} - 165\,a^8\tan\left(dx+c\right)^{9} + 330i\,a^8\tan\left(dx+c\right)^{8} + 330\,a^8\tan\left(dx+c\right)^{7} -}{55}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/55*(5*a^8*tan(d*x + c)^11 - 44*I*a^8*tan(d*x + c)^10 - 165*a^8*tan(d*x +
c)^9 + 330*I*a^8*tan(d*x + c)^8 + 330*a^8*tan(d*x + c)^7 + 462*a^8*tan(d*x
+ c)^5 - 660*I*a^8*tan(d*x + c)^4 - 495*a^8*tan(d*x + c)^3 + 220*I*a^8*tan(
d*x + c)^2 + 55*a^8*tan(d*x + c))/d
```

maple [B] time = 0.51, size = 339, normalized size = 6.16

$$\frac{a^8\left(\frac{\sin^9(dx+c)}{11\cos(dx+c)^{11}} + \frac{2\left(\sin^9(dx+c)\right)}{99\cos(dx+c)^9}\right) - 56ia^8\left(\frac{\sin^4(dx+c)}{6\cos(dx+c)^6} + \frac{\sin^4(dx+c)}{12\cos(dx+c)^4}\right) - 28a^8\left(\frac{\sin^7(dx+c)}{9\cos(dx+c)^9} + \frac{2\left(\sin^7(dx+c)\right)}{63\cos(dx+c)^7}\right) + \frac{2ia^8}{\cos(dx+c)}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/d*(a^8*(1/11*sin(d*x+c)^9/cos(d*x+c)^11+2/99*sin(d*x+c)^9/cos(d*x+c)^9)-5
6*I*a^8*(1/6*sin(d*x+c)^4/cos(d*x+c)^6+1/12*sin(d*x+c)^4/cos(d*x+c)^4)-28*a
^8*(1/9*sin(d*x+c)^7/cos(d*x+c)^9+2/63*sin(d*x+c)^7/cos(d*x+c)^7)+2*I*a^8/c
os(d*x+c)^4+70*a^8*(1/7*sin(d*x+c)^5/cos(d*x+c)^7+2/35*sin(d*x+c)^5/cos(d*x
+c)^5)+56*I*a^8*(1/8*sin(d*x+c)^6/cos(d*x+c)^8+1/24*sin(d*x+c)^6/cos(d*x+c)
^6)-28*a^8*(1/5*sin(d*x+c)^3/cos(d*x+c)^5+2/15*sin(d*x+c)^3/cos(d*x+c)^3)-8
*I*a^8*(1/10*sin(d*x+c)^8/cos(d*x+c)^10+1/40*sin(d*x+c)^8/cos(d*x+c)^8)-a^8
*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c))
```

maxima [B] time = 0.33, size = 134, normalized size = 2.44

$$\frac{45\,a^8\tan\left(dx+c\right)^{11} - 396i\,a^8\tan\left(dx+c\right)^{10} - 1485\,a^8\tan\left(dx+c\right)^{9} + 2970i\,a^8\tan\left(dx+c\right)^{8} + 2970\,a^8\tan\left(dx\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] 1/495*(45*a^8*tan(d*x + c)^11 - 396*I*a^8*tan(d*x + c)^10 - 1485*a^8*tan(d*
x + c)^9 + 2970*I*a^8*tan(d*x + c)^8 + 2970*a^8*tan(d*x + c)^7 + 4158*a^8*t
an(d*x + c)^5 - 5940*I*a^8*tan(d*x + c)^4 - 4455*a^8*tan(d*x + c)^3 + 1980*
I*a^8*tan(d*x + c)^2 + 495*a^8*tan(d*x + c))/d
```

mupad [B] time = 4.22, size = 107, normalized size = 1.95

$$\frac{a^8\left(\frac{\sin(9c+9dx)}{10}+\frac{\sin(11c+11dx)}{110}+\frac{\cos(c+dx)\,63\mathrm{i}}{1280}+\frac{\cos(3c+3dx)\,9\mathrm{i}}{256}+\frac{\cos(5c+5dx)\,9\mathrm{i}}{512}+\frac{\cos(7c+7dx)\,3\mathrm{i}}{512}-\frac{\cos(9c+9dx)\,253\mathrm{i}}{2560}-\frac{\cos(\right.}{d\cos(c+dx)^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^8/cos(c + d*x)^4,x)
```

```
[Out] (a^8*((cos(c + d*x)*63i)/1280 + (cos(3*c + 3*d*x)*9i)/256 + (cos(5*c + 5*d*
x)*9i)/512 + (cos(7*c + 7*d*x)*3i)/512 - (cos(9*c + 9*d*x)*253i)/2560 - (co
s(11*c + 11*d*x)*23i)/2560 + sin(9*c + 9*d*x)/10 + sin(11*c + 11*d*x)/110))
/(d*cos(c + d*x)^11)
```

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

$$a^8\left(\int\left(-28\tan^2(c+dx)\sec^4(c+dx)\right)dx+\int 70\tan^4(c+dx)\sec^4(c+dx)\,dx+\int\left(-28\tan^6(c+dx)\sec^4(c+\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4*(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] a**8*(Integral(-28*tan(c + d*x)**2*sec(c + d*x)**4, x) + Integral(70*tan(c
+ d*x)**4*sec(c + d*x)**4, x) + Integral(-28*tan(c + d*x)**6*sec(c + d*x)**
4, x) + Integral(tan(c + d*x)**8*sec(c + d*x)**4, x) + Integral(8*I*tan(c +
 d*x)*sec(c + d*x)**4, x) + Integral(-56*I*tan(c + d*x)**3*sec(c + d*x)**4,
 x) + Integral(56*I*tan(c + d*x)**5*sec(c + d*x)**4, x) + Integral(-8*I*tan
(c + d*x)**7*sec(c + d*x)**4, x) + Integral(sec(c + d*x)**4, x))
```

3.80 $\int \sec^2(c+dx)(a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=27

$$-\frac{i(a+ia\tan(c+dx))^9}{9ad}$$

```
[Out] -1/9*I*(a+I*a*tan(d*x+c))^9/a/d
```

Rubi [A] time = 0.04, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 32}

$$-\frac{i(a+ia\tan(c+dx))^9}{9ad}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((-I/9)*(a + I*a*Tan[c + d*x])^9)/(a*d)
```

Rule 32

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^2(c+dx)(a+ia\tan(c+dx))^8\,dx &= -\frac{i\,\text{Subst}\left(\int (a+x)^8\,dx, x, ia\tan(c+dx)\right)}{ad}\\ &= -\frac{i(a+ia\tan(c+dx))^9}{9ad}\end{aligned}$$

Mathematica [B] time = 3.65, size = 212, normalized size = 7.85

$$\frac{a^8\sec(c)\sec^9(c+dx)(-126\sin(2c+dx)+84\sin(2c+3dx)-84\sin(4c+3dx)+36\sin(4c+5dx)-36\sin(6c\cdots}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (a^8*Sec[c]*Sec[c + d*x]^9*((126*I)*Cos[d*x] + (126*I)*Cos[2*c + d*x] + (84*I)*Cos[2*c + 3*d*x] + (84*I)*Cos[4*c + 3*d*x] + (36*I)*Cos[4*c + 5*d*x] + (36*I)*Cos[6*c + 5*d*x] + (9*I)*Cos[6*c + 7*d*x] + (9*I)*Cos[8*c + 7*d*x] + 126*Sin[d*x] - 126*Sin[2*c + d*x] + 84*Sin[2*c + 3*d*x] - 84*Sin[4*c + 3*d*x] + 36*Sin[4*c + 5*d*x] - 36*Sin[6*c + 5*d*x] + 9*Sin[6*c + 7*d*x] - 9*Sin[8*c + 7*d*x] + 2*Sin[8*c + 9*d*x]))/(18*d)
```

fricas [B] time = 0.50, size = 231, normalized size = 8.56

$$\frac{4608i\,a^8e^{(16i\,dx+16i\,c)}+18432i\,a^8e^{(14i\,dx+14i\,c)}+43008i\,a^8e^{(12i\,dx+12i\,c)}+64512i\,a^8e^{(10i\,dx+10i\,c)}+64512i\,a^8e^{(8i\,dx+8\cdots}}{9\left(de^{(18i\,dx+18i\,c)}+9\,de^{(16i\,dx+16i\,c)}+36\,de^{(14i\,dx+14i\,c)}+84\,de^{(12i\,dx+12i\,c)}+126\,de^{(10i\,dx+10i\,c)}+126\,d\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/9*(4608*I*a^8*e^(16*I*d*x + 16*I*c) + 18432*I*a^8*e^(14*I*d*x + 14*I*c) +
 43008*I*a^8*e^(12*I*d*x + 12*I*c) + 64512*I*a^8*e^(10*I*d*x + 10*I*c) + 64
512*I*a^8*e^(8*I*d*x + 8*I*c) + 43008*I*a^8*e^(6*I*d*x + 6*I*c) + 18432*I*a
^8*e^(4*I*d*x + 4*I*c) + 4608*I*a^8*e^(2*I*d*x + 2*I*c) + 512*I*a^8)/(d*e^(
18*I*d*x + 18*I*c) + 9*d*e^(16*I*d*x + 16*I*c) + 36*d*e^(14*I*d*x + 14*I*c)
 + 84*d*e^(12*I*d*x + 12*I*c) + 126*d*e^(10*I*d*x + 10*I*c) + 126*d*e^(8*I*
d*x + 8*I*c) + 84*d*e^(6*I*d*x + 6*I*c) + 36*d*e^(4*I*d*x + 4*I*c) + 9*d*e^
(2*I*d*x + 2*I*c) + d)
```

giac [B] time = 4.21, size = 120, normalized size = 4.44

$$\frac{a^8 \tan(dx+c)^9 - 9i\,a^8 \tan(dx+c)^8 - 36\,a^8 \tan(dx+c)^7 + 84i\,a^8 \tan(dx+c)^6 + 126\,a^8 \tan(dx+c)^5 - 126i\,a^8 \tan}{9\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/9*(a^8*tan(d*x + c)^9 - 9*I*a^8*tan(d*x + c)^8 - 36*a^8*tan(d*x + c)^7 +
84*I*a^8*tan(d*x + c)^6 + 126*a^8*tan(d*x + c)^5 - 126*I*a^8*tan(d*x + c)^4
 - 84*a^8*tan(d*x + c)^3 + 36*I*a^8*tan(d*x + c)^2 + 9*a^8*tan(d*x + c))/d
```

maple [B] time = 0.48, size = 180, normalized size = 6.67

$$\frac{\frac{a^8\left(\sin^9(dx+c)\right)}{9\cos(dx+c)^9} - \frac{14ia^8\left(\sin^4(dx+c)\right)}{\cos(dx+c)^4} - \frac{4a^8\left(\sin^7(dx+c)\right)}{\cos(dx+c)^7} + \frac{28ia^8\left(\sin^6(dx+c)\right)}{3\cos(dx+c)^6} + \frac{14a^8\left(\sin^5(dx+c)\right)}{\cos(dx+c)^5} - \frac{ia^8\left(\sin^8(dx+c)\right)}{\cos(dx+c)^8} - \frac{28a^8\left(\sin^3(dx+c)\right)}{3\cos(dx+c)^3} + \frac{}{c}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/d*(1/9*a^8*sin(d*x+c)^9/cos(d*x+c)^9-14*I*a^8*sin(d*x+c)^4/cos(d*x+c)^4-4
*a^8*sin(d*x+c)^7/cos(d*x+c)^7+28/3*I*a^8*sin(d*x+c)^6/cos(d*x+c)^6+14*a^8*
sin(d*x+c)^5/cos(d*x+c)^5-I*a^8*sin(d*x+c)^8/cos(d*x+c)^8-28/3*a^8*sin(d*x+
c)^3/cos(d*x+c)^3+4*I*a^8/cos(d*x+c)^2+a^8*tan(d*x+c))
```

maxima [A] time = 0.51, size = 21, normalized size = 0.78

$$-\frac{i\,(i\,a\tan(dx+c)+a)^9}{9\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] -1/9*I*(I*a*tan(d*x + c) + a)^9/(a*d)
```

mupad [B] time = 3.83, size = 83, normalized size = 3.07

$$\frac{a^8\left(\sin(9\,c+9\,d\,x) + \frac{\cos(c+d\,x)\,63\mathrm{i}}{128} + \frac{\cos(3\,c+3\,d\,x)\,21\mathrm{i}}{64} + \frac{\cos(5\,c+5\,d\,x)\,9\mathrm{i}}{64} + \frac{\cos(7\,c+7\,d\,x)\,9\mathrm{i}}{256} - \frac{\cos(9\,c+9\,d\,x)\,255\mathrm{i}}{256}\right)}{9\,d\cos(c+d\,x)^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^8/cos(c + d*x)^2,x)
```

```
[Out] (a^8*((cos(c + d*x)*63i)/128 + (cos(3*c + 3*d*x)*21i)/64 + (cos(5*c + 5*d*x
)*9i)/64 + (cos(7*c + 7*d*x)*9i)/256 - (cos(9*c + 9*d*x)*255i)/256 + sin(9*
c + 9*d*x)))/(9*d*cos(c + d*x)^9)
```

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

$$a^8 \left(\int \left(-28 \tan^2 (c + dx) \sec^2 (c + dx) \right) dx + \int 70 \tan^4 (c + dx) \sec^2 (c + dx) \, dx + \int \left(-28 \tan^6 (c + dx) \sec^2 (\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2*(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] a**8*(Integral(-28*tan(c + d*x)**2*sec(c + d*x)**2, x) + Integral(70*tan(c
+ d*x)**4*sec(c + d*x)**2, x) + Integral(-28*tan(c + d*x)**6*sec(c + d*x)**
2, x) + Integral(tan(c + d*x)**8*sec(c + d*x)**2, x) + Integral(8*I*tan(c +
 d*x)*sec(c + d*x)**2, x) + Integral(-56*I*tan(c + d*x)**3*sec(c + d*x)**2,
 x) + Integral(56*I*tan(c + d*x)**5*sec(c + d*x)**2, x) + Integral(-8*I*tan
(c + d*x)**7*sec(c + d*x)**2, x) + Integral(sec(c + d*x)**2, x))
```

3.81 $\int (a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=200

$$-\frac{64a^8\tan(c+dx)}{d}-\frac{128ia^8\log(\cos(c+dx))}{d}+128a^8x+\frac{16i\left(a^4+ia^4\tan(c+dx)\right)^2}{d}+\frac{4ia^3(a+ia\tan(c+dx))^5}{5d}+\frac{ia^2\cdots}{}$$

```
[Out] 128*a^8*x-128*I*a^8*ln(cos(d*x+c))/d-64*a^8*tan(d*x+c)/d+4/5*I*a^3*(a+I*a*t
an(d*x+c))^5/d+1/3*I*a^2*(a+I*a*tan(d*x+c))^6/d+1/7*I*a*(a+I*a*tan(d*x+c))^
7/d+16/3*I*a^2*(a^2+I*a^2*tan(d*x+c))^3/d+2*I*(a^2+I*a^2*tan(d*x+c))^4/d+16
*I*(a^4+I*a^4*tan(d*x+c))^2/d
```

Rubi [A] time = 0.14, antiderivative size = 200, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3478, 3477, 3475}

$$-\frac{64a^8\tan(c+dx)}{d}+\frac{4ia^3(a+ia\tan(c+dx))^5}{5d}+\frac{ia^2(a+ia\tan(c+dx))^6}{3d}+\frac{16ia^2\left(a^2+ia^2\tan(c+dx)\right)^3}{3d}+\frac{2i\left(a^2+i\cdots\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] 128*a^8*x - ((128*I)*a^8*Log[Cos[c + d*x]])/d - (64*a^8*Tan[c + d*x])/d + (
((4*I)/5)*a^3*(a + I*a*Tan[c + d*x])^5)/d + ((I/3)*a^2*(a + I*a*Tan[c + d*x
])^6)/d + ((I/7)*a*(a + I*a*Tan[c + d*x])^7)/d + (((16*I)/3)*a^2*(a^2 + I*a
^2*Tan[c + d*x])^3)/d + ((2*I)*(a^2 + I*a^2*Tan[c + d*x])^4)/d + ((16*I)*(a
^4 + I*a^4*Tan[c + d*x])^2)/d
```

Rule 3475

```
Int[tan[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[Log[RemoveContent[Cos[c + d
*x], x]]/d, x] /; FreeQ[{c, d}, x]
```

Rule 3477

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

Rule 3478

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

Rubi steps

$$\int (a+ia\tan(c+dx))^8\,dx = \frac{ia(a+ia\tan(c+dx))^7}{7d} + (2a)\int (a+ia\tan(c+dx))^7\,dx$$
$$= \frac{ia^2(a+ia\tan(c+dx))^6}{3d} + \frac{ia(a+ia\tan(c+dx))^7}{7d} + \left(4a^2\right)\int (a+ia\tan(c+dx))^6$$
$$= \frac{4ia^3(a+ia\tan(c+dx))^5}{5d} + \frac{ia^2(a+ia\tan(c+dx))^6}{3d} + \frac{ia(a+ia\tan(c+dx))^7}{7d} + ($$
$$= \frac{4ia^3(a+ia\tan(c+dx))^5}{5d} + \frac{ia^2(a+ia\tan(c+dx))^6}{3d} + \frac{ia(a+ia\tan(c+dx))^7}{7d} + $$
$$= \frac{16ia^5(a+ia\tan(c+dx))^3}{3d} + \frac{4ia^3(a+ia\tan(c+dx))^5}{5d} + \frac{ia^2(a+ia\tan(c+dx))^6}{3d}$$
$$= \frac{16ia^5(a+ia\tan(c+dx))^3}{3d} + \frac{4ia^3(a+ia\tan(c+dx))^5}{5d} + \frac{ia^2(a+ia\tan(c+dx))^6}{3d}$$
$$= 128a^8x - \frac{64a^8\tan(c+dx)}{d} + \frac{16ia^5(a+ia\tan(c+dx))^3}{3d} + \frac{4ia^3(a+ia\tan(c+dx)}{5d}$$
$$= 128a^8x - \frac{128ia^8\log(\cos(c+dx))}{d} - \frac{64a^8\tan(c+dx)}{d} + \frac{16ia^5(a+ia\tan(c+dx))}{3d}$$

Mathematica [A] time = 4.99, size = 383, normalized size = 1.92

$$\frac{a^8\sec(c)\sec^7(c+dx)\left(70\cos(dx)\left(-105i\log\left(\cos^2(c+dx)\right)+210dx-139i\right)+70\cos(2c+dx)\left(-105i\log\left(\text{co}\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (a^8*Sec[c]*Sec[c + d*x]^7*(70*Cos[d*x]*(-139*I + 210*d*x - (105*I)*Log[Cos
[c + d*x]^2]) + 70*Cos[2*c + d*x]*(-139*I + 210*d*x - (105*I)*Log[Cos[c + d
*x]^2]) + 3*((-420*I)*Cos[4*c + 5*d*x] + 980*d*x*Cos[4*c + 5*d*x] - (420*I)
*Cos[6*c + 5*d*x] + 980*d*x*Cos[6*c + 5*d*x] + 140*d*x*Cos[6*c + 7*d*x] + 1
40*d*x*Cos[8*c + 7*d*x] + 70*Cos[2*c + 3*d*x]*(-25*I + 42*d*x - (21*I)*Log[
Cos[c + d*x]^2]) + 70*Cos[4*c + 3*d*x]*(-25*I + 42*d*x - (21*I)*Log[Cos[c +
 d*x]^2]) - (490*I)*Cos[4*c + 5*d*x]*Log[Cos[c + d*x]^2] - (490*I)*Cos[6*c
+ 5*d*x]*Log[Cos[c + d*x]^2] - (70*I)*Cos[6*c + 7*d*x]*Log[Cos[c + d*x]^2]
- (70*I)*Cos[8*c + 7*d*x]*Log[Cos[c + d*x]^2] - 6965*Sin[d*x] + 5740*Sin[2*
c + d*x] - 4963*Sin[2*c + 3*d*x] + 2660*Sin[4*c + 3*d*x] - 1981*Sin[4*c + 5
*d*x] + 560*Sin[6*c + 5*d*x] - 363*Sin[6*c + 7*d*x])))/(420*d)
```

fricas [A] time = 0.56, size = 296, normalized size = 1.48

$$\frac{-94080i\,a^8e^{(12i\,dx+12i\,c)} - 423360i\,a^8e^{(10i\,dx+10i\,c)} - 862400i\,a^8e^{(8i\,dx+8i\,c)} - 980000i\,a^8e^{(6i\,dx+6i\,c)} - 644448i\,a^8e^{(4i}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/105*(-94080*I*a^8*e^(12*I*d*x + 12*I*c) - 423360*I*a^8*e^(10*I*d*x + 10*I
*c) - 862400*I*a^8*e^(8*I*d*x + 8*I*c) - 980000*I*a^8*e^(6*I*d*x + 6*I*c) -
 644448*I*a^8*e^(4*I*d*x + 4*I*c) - 230496*I*a^8*e^(2*I*d*x + 2*I*c) - 3484
8*I*a^8 + (-13440*I*a^8*e^(14*I*d*x + 14*I*c) - 94080*I*a^8*e^(12*I*d*x + 1
2*I*c) - 282240*I*a^8*e^(10*I*d*x + 10*I*c) - 470400*I*a^8*e^(8*I*d*x + 8*I
*c) - 470400*I*a^8*e^(6*I*d*x + 6*I*c) - 282240*I*a^8*e^(4*I*d*x + 4*I*c) -
```

```
94080*I*a^8*e^(2*I*d*x + 2*I*c) - 13440*I*a^8)*log(e^(2*I*d*x + 2*I*c) + 1
))/(d*e^(14*I*d*x + 14*I*c) + 7*d*e^(12*I*d*x + 12*I*c) + 21*d*e^(10*I*d*x
+ 10*I*c) + 35*d*e^(8*I*d*x + 8*I*c) + 35*d*e^(6*I*d*x + 6*I*c) + 21*d*e^(4
*I*d*x + 4*I*c) + 7*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [B] time = 1.32, size = 378, normalized size = 1.89

$$\frac{-13440i\,a^8e^{(14i\,dx+14i\,c)}\log\left(e^{(2i\,dx+2i\,c)}+1\right)-94080i\,a^8e^{(12i\,dx+12i\,c)}\log\left(e^{(2i\,dx+2i\,c)}+1\right)-282240i\,a^8e^{(10i\,dx+10i\,c)}\log}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/105*(-13440*I*a^8*e^(14*I*d*x + 14*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 94
080*I*a^8*e^(12*I*d*x + 12*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 282240*I*a^8
*e^(10*I*d*x + 10*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 470400*I*a^8*e^(8*I*d
*x + 8*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 470400*I*a^8*e^(6*I*d*x + 6*I*c)
*log(e^(2*I*d*x + 2*I*c) + 1) - 282240*I*a^8*e^(4*I*d*x + 4*I*c)*log(e^(2*I
*d*x + 2*I*c) + 1) - 94080*I*a^8*e^(2*I*d*x + 2*I*c)*log(e^(2*I*d*x + 2*I*c
) + 1) - 94080*I*a^8*e^(12*I*d*x + 12*I*c) - 423360*I*a^8*e^(10*I*d*x + 10*
I*c) - 862400*I*a^8*e^(8*I*d*x + 8*I*c) - 980000*I*a^8*e^(6*I*d*x + 6*I*c)
- 644448*I*a^8*e^(4*I*d*x + 4*I*c) - 230496*I*a^8*e^(2*I*d*x + 2*I*c) - 134
40*I*a^8*log(e^(2*I*d*x + 2*I*c) + 1) - 34848*I*a^8)/(d*e^(14*I*d*x + 14*I*
c) + 7*d*e^(12*I*d*x + 12*I*c) + 21*d*e^(10*I*d*x + 10*I*c) + 35*d*e^(8*I*d
*x + 8*I*c) + 35*d*e^(6*I*d*x + 6*I*c) + 21*d*e^(4*I*d*x + 4*I*c) + 7*d*e^(
2*I*d*x + 2*I*c) + d)
```

maple [A] time = 0.02, size = 150, normalized size = 0.75

$$-\frac{127a^8\tan(dx+c)}{d}+\frac{a^8\left(\tan^7(dx+c)\right)}{7d}-\frac{4ia^8\left(\tan^6(dx+c)\right)}{3d}-\frac{29a^8\left(\tan^5(dx+c)\right)}{5d}+\frac{16ia^8\left(\tan^4(dx+c)\right)}{d}+\frac{33a^8}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^8,x)
```

```
[Out] -127*a^8*tan(d*x+c)/d+1/7/d*a^8*tan(d*x+c)^7-4/3*I/d*a^8*tan(d*x+c)^6-29/5*
a^8*tan(d*x+c)^5/d+16*I/d*a^8*tan(d*x+c)^4+33*a^8*tan(d*x+c)^3/d-60*I/d*a^8
*tan(d*x+c)^2+64*I/d*a^8*ln(1+tan(d*x+c)^2)+128/d*a^8*arctan(tan(d*x+c))
```

maxima [A] time = 0.65, size = 121, normalized size = 0.60

$$\frac{15\,a^8\tan(dx+c)^7-140i\,a^8\tan(dx+c)^6-609\,a^8\tan(dx+c)^5+1680i\,a^8\tan(dx+c)^4+3465\,a^8\tan(dx+c)^3-}{105\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] 1/105*(15*a^8*tan(d*x + c)^7 - 140*I*a^8*tan(d*x + c)^6 - 609*a^8*tan(d*x +
 c)^5 + 1680*I*a^8*tan(d*x + c)^4 + 3465*a^8*tan(d*x + c)^3 - 6300*I*a^8*ta
n(d*x + c)^2 + 13440*(d*x + c)*a^8 + 6720*I*a^8*log(tan(d*x + c)^2 + 1) - 1
3335*a^8*tan(d*x + c))/d
```

mupad [B] time = 3.40, size = 113, normalized size = 0.56

$$\frac{33\,a^8\tan(c+d\,x)^3-127\,a^8\tan(c+d\,x)-\frac{29\,a^8\tan(c+d\,x)^5}{5}+\frac{a^8\tan(c+d\,x)^7}{7}+a^8\,\ln(\tan(c+d\,x)+1\mathrm{i})\,128\mathrm{i}-a^8\tan(}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] (a^8*log(tan(c + d*x) + 1i)*128i - 127*a^8*tan(c + d*x) - a^8*tan(c + d*x)^
2*60i + 33*a^8*tan(c + d*x)^3 + a^8*tan(c + d*x)^4*16i - (29*a^8*tan(c + d*
x)^5)/5 - (a^8*tan(c + d*x)^6*4i)/3 + (a^8*tan(c + d*x)^7)/7)/d
```

sympy [A] time = 0.82, size = 301, normalized size = 1.50

$$-\frac{128ia^8\log\left(e^{2idx}+e^{-2ic}\right)}{d}+\frac{94080ia^8e^{12ic}e^{12idx}+423360ia^8e^{10ic}e^{10idx}+862400ia^8e^{8ic}e^{8idx}+980000ia^8e^{6ic}e^{6idx}}{-105de^{14ic}e^{14idx}-735de^{12ic}e^{12idx}-2205de^{10ic}e^{10idx}-3675de^{8ic}e^{8idx}-3675d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**8,x)
```

```
[Out] -128*I*a**8*log(exp(2*I*d*x) + exp(-2*I*c))/d + (94080*I*a**8*exp(12*I*c)*e
xp(12*I*d*x) + 423360*I*a**8*exp(10*I*c)*exp(10*I*d*x) + 862400*I*a**8*exp(
8*I*c)*exp(8*I*d*x) + 980000*I*a**8*exp(6*I*c)*exp(6*I*d*x) + 644448*I*a**8
*exp(4*I*c)*exp(4*I*d*x) + 230496*I*a**8*exp(2*I*c)*exp(2*I*d*x) + 34848*I*
a**8)/(-105*d*exp(14*I*c)*exp(14*I*d*x) - 735*d*exp(12*I*c)*exp(12*I*d*x) -
 2205*d*exp(10*I*c)*exp(10*I*d*x) - 3675*d*exp(8*I*c)*exp(8*I*d*x) - 3675*d
*exp(6*I*c)*exp(6*I*d*x) - 2205*d*exp(4*I*c)*exp(4*I*d*x) - 735*d*exp(2*I*c
)*exp(2*I*d*x) - 105*d)
```

3.82 $\int \cos^2(c+dx)(a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=133

$$-\frac{64ia^9}{d(a-ia\tan(c+dx))}+\frac{a^8\tan^5(c+dx)}{5d}-\frac{2ia^8\tan^4(c+dx)}{d}-\frac{10a^8\tan^3(c+dx)}{d}+\frac{36ia^8\tan^2(c+dx)}{d}+\frac{129a^8\tan(c}{d}$$

```
[Out] -192*a^8*x+192*I*a^8*ln(cos(d*x+c))/d+129*a^8*tan(d*x+c)/d+36*I*a^8*tan(d*x
+c)^2/d-10*a^8*tan(d*x+c)^3/d-2*I*a^8*tan(d*x+c)^4/d+1/5*a^8*tan(d*x+c)^5/d
-64*I*a^9/d/(a-I*a*tan(d*x+c))
```

Rubi [A] time = 0.08, antiderivative size = 133, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {3487, 43}

$$\frac{a^8\tan^5(c+dx)}{5d}-\frac{2ia^8\tan^4(c+dx)}{d}-\frac{10a^8\tan^3(c+dx)}{d}+\frac{36ia^8\tan^2(c+dx)}{d}-\frac{64ia^9}{d(a-ia\tan(c+dx))}+\frac{129a^8\tan(c+}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] -192*a^8*x + ((192*I)*a^8*Log[Cos[c + d*x]])/d + (129*a^8*Tan[c + d*x])/d +
 ((36*I)*a^8*Tan[c + d*x]^2)/d - (10*a^8*Tan[c + d*x]^3)/d - ((2*I)*a^8*Tan
[c + d*x]^4)/d + (a^8*Tan[c + d*x]^5)/(5*d) - ((64*I)*a^9)/(d*(a - I*a*Tan[
c + d*x]))
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \cos^2(c+dx)(a+ia\tan(c+dx))^8\,dx &= -\frac{\left(ia^3\right)\text{Subst}\left(\int \frac{(a+x)^6}{(a-x)^2}\,dx, x, ia\tan(c+dx)\right)}{d}\\ &= -\frac{\left(ia^3\right)\text{Subst}\left(\int \left(129a^4+\frac{64a^6}{(a-x)^2}-\frac{192a^5}{a-x}+72a^3x+30a^2x^2+8ax^3+x^4\right)\right.}{d}\\ &= -192a^8x+\frac{192ia^8\log(\cos(c+dx))}{d}+\frac{129a^8\tan(c+dx)}{d}+\frac{36ia^8\tan^2(c}{d}\end{aligned}$$

Mathematica [B] time = 7.01, size = 321, normalized size = 2.41

$$\frac{\cos^3(c+dx)(a+ia\tan(c+dx))^8\left(-960dx\cos(8c)\cos^5(c+dx)-160i(\cos(6c)-i\sin(6c))\cos(2dx)\cos^5(c+dx)\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (Cos[c + d*x]^3*(-960*d*x*Cos[8*c]*Cos[c + d*x]^5 + (480*I)*Cos[8*c]*Cos[c
+ d*x]^5*Log[Cos[c + d*x]^2] - (160*I)*Cos[2*d*x]*Cos[c + d*x]^5*(Cos[6*c]
- I*Sin[6*c]) + (960*I)*d*x*Cos[c + d*x]^5*Sin[8*c] + 480*Cos[c + d*x]^5*Lo
g[Cos[c + d*x]^2]*Sin[8*c] + Sec[c]*(Cos[8*c] - I*Sin[8*c])*Sin[d*x] - 52*C
os[c + d*x]^2*Sec[c]*(Cos[8*c] - I*Sin[8*c])*Sin[d*x] + 696*Cos[c + d*x]^4*
Sec[c]*(Cos[8*c] - I*Sin[8*c])*Sin[d*x] + 160*Cos[c + d*x]^5*(Cos[6*c] - I*
Sin[6*c])*Sin[2*d*x] + Cos[c + d*x]*(Cos[8*c] - I*Sin[8*c])*(-10*I + Tan[c]
) - 4*Cos[c + d*x]^3*(Cos[8*c] - I*Sin[8*c])*(-50*I + 13*Tan[c]))*(a + I*a*
Tan[c + d*x])^8)/(5*d*(Cos[d*x] + I*Sin[d*x])^8)
```

fricas [B] time = 0.58, size = 244, normalized size = 1.83

$$\frac{-160i\,a^8e^{(12i\,dx+12i\,c)} - 800i\,a^8e^{(10i\,dx+10i\,c)} + 800i\,a^8e^{(8i\,dx+8i\,c)} + 6400i\,a^8e^{(6i\,dx+6i\,c)} + 9600i\,a^8e^{(4i\,dx+4i\,c)} + 6000i}{5\left(de^{(10i\,dx+10i\,c)} + \right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/5*(-160*I*a^8*e^(12*I*d*x + 12*I*c) - 800*I*a^8*e^(10*I*d*x + 10*I*c) + 8
00*I*a^8*e^(8*I*d*x + 8*I*c) + 6400*I*a^8*e^(6*I*d*x + 6*I*c) + 9600*I*a^8*
e^(4*I*d*x + 4*I*c) + 6000*I*a^8*e^(2*I*d*x + 2*I*c) + 1392*I*a^8 + (960*I*
a^8*e^(10*I*d*x + 10*I*c) + 4800*I*a^8*e^(8*I*d*x + 8*I*c) + 9600*I*a^8*e^(
6*I*d*x + 6*I*c) + 9600*I*a^8*e^(4*I*d*x + 4*I*c) + 4800*I*a^8*e^(2*I*d*x +
 2*I*c) + 960*I*a^8)*log(e^(2*I*d*x + 2*I*c) + 1))/(d*e^(10*I*d*x + 10*I*c)
 + 5*d*e^(8*I*d*x + 8*I*c) + 10*d*e^(6*I*d*x + 6*I*c) + 10*d*e^(4*I*d*x + 4
*I*c) + 5*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [B] time = 5.53, size = 302, normalized size = 2.27

$$\frac{960i\,a^8e^{(10i\,dx+10i\,c)}\log\left(e^{(2i\,dx+2i\,c)}+1\right) + 4800i\,a^8e^{(8i\,dx+8i\,c)}\log\left(e^{(2i\,dx+2i\,c)}+1\right) + 9600i\,a^8e^{(6i\,dx+6i\,c)}\log\left(e^{(2i\,dx}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/5*(960*I*a^8*e^(10*I*d*x + 10*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) + 4800*I*
a^8*e^(8*I*d*x + 8*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) + 9600*I*a^8*e^(6*I*d*
x + 6*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) + 9600*I*a^8*e^(4*I*d*x + 4*I*c)*lo
g(e^(2*I*d*x + 2*I*c) + 1) + 4800*I*a^8*e^(2*I*d*x + 2*I*c)*log(e^(2*I*d*x
+ 2*I*c) + 1) - 160*I*a^8*e^(12*I*d*x + 12*I*c) - 800*I*a^8*e^(10*I*d*x + 1
0*I*c) + 800*I*a^8*e^(8*I*d*x + 8*I*c) + 6400*I*a^8*e^(6*I*d*x + 6*I*c) + 9
600*I*a^8*e^(4*I*d*x + 4*I*c) + 6000*I*a^8*e^(2*I*d*x + 2*I*c) + 960*I*a^8*
log(e^(2*I*d*x + 2*I*c) + 1) + 1392*I*a^8)/(d*e^(10*I*d*x + 10*I*c) + 5*d*e
^(8*I*d*x + 8*I*c) + 10*d*e^(6*I*d*x + 6*I*c) + 10*d*e^(4*I*d*x + 4*I*c) +
5*d*e^(2*I*d*x + 2*I*c) + d)
```

maple [B] time = 0.59, size = 406, normalized size = 3.05

$$\frac{4ia^8\left(\sin^6(dx+c)\right)}{d} + \frac{8a^8\cos(dx+c)\left(\sin^7(dx+c)\right)}{5d} - \frac{192a^8c}{d} + \frac{34ia^8\left(\sin^4(dx+c)\right)}{d} + \frac{28ia^8\left(\sin^6(dx+c)\right)}{d\cos(dx+c)^2} - \frac{2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 4*I/d*a^8*sin(d*x+c)^6+8/5/d*a^8*cos(d*x+c)*sin(d*x+c)^7-192/d*a^8*c+34*I/d
*a^8*sin(d*x+c)^4+28*I/d*a^8*sin(d*x+c)^6/cos(d*x+c)^2-2*I/d*a^8*sin(d*x+c)
```

```
^8/cos(d*x+c)^4+4*I/d*a^8*sin(d*x+c)^8/cos(d*x+c)^2+70/d*a^8*sin(d*x+c)^5/c
os(d*x+c)+192*I*a^8*ln(cos(d*x+c))/d-4*I/d*a^8*cos(d*x+c)^2+96*I/d*a^8*sin(
d*x+c)^2+193/d*a^8*sin(d*x+c)*cos(d*x+c)-28/3/d*a^8*sin(d*x+c)^7/cos(d*x+c)
^3+112/3/d*a^8*sin(d*x+c)^7/cos(d*x+c)-192*a^8*x+1/5/d*a^8*sin(d*x+c)^9/cos
(d*x+c)^5-4/15/d*a^8*sin(d*x+c)^9/cos(d*x+c)^3+8/5/d*a^8*sin(d*x+c)^9/cos(d
*x+c)+196/5/d*a^8*cos(d*x+c)*sin(d*x+c)^5+119/d*a^8*cos(d*x+c)*sin(d*x+c)^3
```

maxima [A] time = 0.71, size = 124, normalized size = 0.93

$$\frac{a^8\tan(dx+c)^5 - 10i\,a^8\tan(dx+c)^4 - 50\,a^8\tan(dx+c)^3 + 180i\,a^8\tan(dx+c)^2 - 960\,(dx+c)a^8 - 480i\,a^8\log(}{5\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] 1/5*(a^8*tan(d*x + c)^5 - 10*I*a^8*tan(d*x + c)^4 - 50*a^8*tan(d*x + c)^3 +
 180*I*a^8*tan(d*x + c)^2 - 960*(d*x + c)*a^8 - 480*I*a^8*log(tan(d*x + c)^
2 + 1) + 645*a^8*tan(d*x + c) + 320*(a^8*tan(d*x + c) - I*a^8)/(tan(d*x + c
)^2 + 1))/d
```

mupad [B] time = 3.35, size = 102, normalized size = 0.77

$$\frac{\frac{64\,a^8}{\tan(c+d\,x)+1\mathrm{i}} + 129\,a^8\tan(c+d\,x) - 10\,a^8\tan(c+d\,x)^3 + \frac{a^8\tan(c+d\,x)^5}{5} - a^8\,\ln(\tan(c+d\,x)+1\mathrm{i})\,192\mathrm{i} + a^8\tan(c+}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] ((64*a^8)/(tan(c + d*x) + 1i) - a^8*log(tan(c + d*x) + 1i)*192i + 129*a^8*t
an(c + d*x) + a^8*tan(c + d*x)^2*36i - 10*a^8*tan(c + d*x)^3 - a^8*tan(c +
d*x)^4*2i + (a^8*tan(c + d*x)^5)/5)/d
```

sympy [A] time = 0.78, size = 257, normalized size = 1.93

$$\frac{192ia^8\log\left(e^{2idx}+e^{-2ic}\right)}{d} + \frac{2400ia^8e^{8ic}e^{8idx} + 8000ia^8e^{6ic}e^{6idx} + 10400ia^8e^{4ic}e^{4idx} + 6160ia^8e^{2ic}e^{2idx} + 1392ia^8}{5de^{10ic}e^{10idx} + 25de^{8ic}e^{8idx} + 50de^{6ic}e^{6idx} + 50de^{4ic}e^{4idx} + 25de^{2ic}e^{2idx} + 5d} + \begin{cases} - \\ 6 \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2*(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] 192*I*a**8*log(exp(2*I*d*x) + exp(-2*I*c))/d + (2400*I*a**8*exp(8*I*c)*exp(
8*I*d*x) + 8000*I*a**8*exp(6*I*c)*exp(6*I*d*x) + 10400*I*a**8*exp(4*I*c)*ex
p(4*I*d*x) + 6160*I*a**8*exp(2*I*c)*exp(2*I*d*x) + 1392*I*a**8)/(5*d*exp(10
*I*c)*exp(10*I*d*x) + 25*d*exp(8*I*c)*exp(8*I*d*x) + 50*d*exp(6*I*c)*exp(6*
I*d*x) + 50*d*exp(4*I*c)*exp(4*I*d*x) + 25*d*exp(2*I*c)*exp(2*I*d*x) + 5*d)
 + Piecewise((-32*I*a**8*exp(2*I*c)*exp(2*I*d*x)/d, Ne(d, 0)), (64*a**8*x*e
xp(2*I*c), True))
```

3.83 $\int \cos^4(c+dx)(a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=124

$$-\frac{16ia^{10}}{d(a-ia\tan(c+dx))^2}+\frac{80ia^9}{d(a-ia\tan(c+dx))}+\frac{a^8\tan^3(c+dx)}{3d}-\frac{4ia^8\tan^2(c+dx)}{d}-\frac{31a^8\tan(c+dx)}{d}-\frac{80ia^8\,\mathrm{lo}}{}$$

```
[Out] 80*a^8*x-80*I*a^8*ln(cos(d*x+c))/d-31*a^8*tan(d*x+c)/d-4*I*a^8*tan(d*x+c)^2
/d+1/3*a^8*tan(d*x+c)^3/d-16*I*a^10/d/(a-I*a*tan(d*x+c))^2+80*I*a^9/d/(a-I*
a*tan(d*x+c))
```

Rubi [A] time = 0.08, antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = $\{3487, 43\}$

$$\frac{a^8\tan^3(c+dx)}{3d}-\frac{4ia^8\tan^2(c+dx)}{d}-\frac{16ia^{10}}{d(a-ia\tan(c+dx))^2}+\frac{80ia^9}{d(a-ia\tan(c+dx))}-\frac{31a^8\tan(c+dx)}{d}-\frac{80ia^8\log}{}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] 80*a^8*x - ((80*I)*a^8*Log[Cos[c + d*x]])/d - (31*a^8*Tan[c + d*x])/d - ((4
*I)*a^8*Tan[c + d*x]^2)/d + (a^8*Tan[c + d*x]^3)/(3*d) - ((16*I)*a^10)/(d*(
a - I*a*Tan[c + d*x])^2) + ((80*I)*a^9)/(d*(a - I*a*Tan[c + d*x]))
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \cos^4(c+dx)(a+ia\tan(c+dx))^8\,dx &= -\frac{\left(ia^5\right)\operatorname{Subst}\left(\int \frac{(a+x)^5}{(a-x)^3}\,dx, x, ia\tan(c+dx)\right)}{d}\\ &= -\frac{\left(ia^5\right)\operatorname{Subst}\left(\int \left(-31a^2+\frac{32a^5}{(a-x)^3}-\frac{80a^4}{(a-x)^2}+\frac{80a^3}{a-x}-8ax-x^2\right)dx, x, ia\right.}{d}\\ &= 80a^8x-\frac{80ia^8\log(\cos(c+dx))}{d}-\frac{31a^8\tan(c+dx)}{d}-\frac{4ia^8\tan^2(c+}{d}\end{aligned}$$

Mathematica [B] time = 2.72, size = 566, normalized size = 4.56

$$\frac{a^8\sec(c)\sec^3(c+dx)(\cos(2(c+5dx))+i\sin(2(c+5dx)))\left(-120idx\sin(2c+dx)+87\sin(2c+dx)-180idx\,\mathrm{s}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (a^8*Sec[c]*Sec[c + d*x]^3*(Cos[2*(c + 5*d*x)] + I*Sin[2*(c + 5*d*x)])*((-6
6*I)*Cos[2*c + 3*d*x] + 180*d*x*Cos[2*c + 3*d*x] + (75*I)*Cos[4*c + 3*d*x]
+ 180*d*x*Cos[4*c + 3*d*x] - (50*I)*Cos[4*c + 5*d*x] + 60*d*x*Cos[4*c + 5*d
*x] - (3*I)*Cos[6*c + 5*d*x] + 60*d*x*Cos[6*c + 5*d*x] + 3*Cos[2*c + d*x]*(
71*I + 80*d*x - (40*I)*Log[Cos[c + d*x]^2]) + Cos[d*x]*(119*I + 240*d*x - (
120*I)*Log[Cos[c + d*x]^2]) - (90*I)*Cos[2*c + 3*d*x]*Log[Cos[c + d*x]^2] -
 (90*I)*Cos[4*c + 3*d*x]*Log[Cos[c + d*x]^2] - (30*I)*Cos[4*c + 5*d*x]*Log[
Cos[c + d*x]^2] - (30*I)*Cos[6*c + 5*d*x]*Log[Cos[c + d*x]^2] - 101*Sin[d*x
] - (120*I)*d*x*Sin[d*x] - 60*Log[Cos[c + d*x]^2]*Sin[d*x] + 87*Sin[2*c + d
*x] - (120*I)*d*x*Sin[2*c + d*x] - 60*Log[Cos[c + d*x]^2]*Sin[2*c + d*x] -
96*Sin[2*c + 3*d*x] - (180*I)*d*x*Sin[2*c + 3*d*x] - 90*Log[Cos[c + d*x]^2]
*Sin[2*c + 3*d*x] + 45*Sin[4*c + 3*d*x] - (180*I)*d*x*Sin[4*c + 3*d*x] - 90
*Log[Cos[c + d*x]^2]*Sin[4*c + 3*d*x] - 44*Sin[4*c + 5*d*x] - (60*I)*d*x*Si
n[4*c + 5*d*x] - 30*Log[Cos[c + d*x]^2]*Sin[4*c + 5*d*x] + 3*Sin[6*c + 5*d*
x] - (60*I)*d*x*Sin[6*c + 5*d*x] - 30*Log[Cos[c + d*x]^2]*Sin[6*c + 5*d*x])
)/(12*d*(Cos[d*x] + I*Sin[d*x])^8)
```

fricas [A] time = 0.62, size = 178, normalized size = 1.44

$$\frac{-12i\,a^8e^{(10i\,dx+10i\,c)} + 60i\,a^8e^{(8i\,dx+8i\,c)} + 252i\,a^8e^{(6i\,dx+6i\,c)} + 36i\,a^8e^{(4i\,dx+4i\,c)} - 324i\,a^8e^{(2i\,dx+2i\,c)} - 188i\,a^8 + \left(-240i\right.}{3\left(de^{(6i\,dx+6i\,c)} + 3\,de^{(4i\,dx+4i\,c)} + 3\,de^{(2i\,dx+}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/3*(-12*I*a^8*e^(10*I*d*x + 10*I*c) + 60*I*a^8*e^(8*I*d*x + 8*I*c) + 252*I
*a^8*e^(6*I*d*x + 6*I*c) + 36*I*a^8*e^(4*I*d*x + 4*I*c) - 324*I*a^8*e^(2*I*
d*x + 2*I*c) - 188*I*a^8 + (-240*I*a^8*e^(6*I*d*x + 6*I*c) - 720*I*a^8*e^(4
*I*d*x + 4*I*c) - 720*I*a^8*e^(2*I*d*x + 2*I*c) - 240*I*a^8)*log(e^(2*I*d*x
 + 2*I*c) + 1))/(d*e^(6*I*d*x + 6*I*c) + 3*d*e^(4*I*d*x + 4*I*c) + 3*d*e^(2
*I*d*x + 2*I*c) + d)
```

giac [B] time = 7.99, size = 785, normalized size = 6.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/1344*(-107520*I*a^8*e^(28*I*d*x + 14*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) -
1505280*I*a^8*e^(26*I*d*x + 12*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 9784320*
I*a^8*e^(24*I*d*x + 10*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 39137280*I*a^8*e
^(22*I*d*x + 8*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 107627520*I*a^8*e^(20*I*
d*x + 6*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 215255040*I*a^8*e^(18*I*d*x + 4
*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 322882560*I*a^8*e^(16*I*d*x + 2*I*c)*l
og(e^(2*I*d*x + 2*I*c) + 1) - 322882560*I*a^8*e^(12*I*d*x - 2*I*c)*log(e^(2
*I*d*x + 2*I*c) + 1) - 215255040*I*a^8*e^(10*I*d*x - 4*I*c)*log(e^(2*I*d*x
+ 2*I*c) + 1) - 107627520*I*a^8*e^(8*I*d*x - 6*I*c)*log(e^(2*I*d*x + 2*I*c)
 + 1) - 39137280*I*a^8*e^(6*I*d*x - 8*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 9
784320*I*a^8*e^(4*I*d*x - 10*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 1505280*I*
a^8*e^(2*I*d*x - 12*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 369008640*I*a^8*e^(
14*I*d*x)*log(e^(2*I*d*x + 2*I*c) + 1) - 107520*I*a^8*e^(-14*I*c)*log(e^(2*
I*d*x + 2*I*c) + 1) - 5376*I*a^8*e^(32*I*d*x + 18*I*c) - 32256*I*a^8*e^(30*
I*d*x + 16*I*c) + 112896*I*a^8*e^(28*I*d*x + 14*I*c) + 1849344*I*a^8*e^(26*
I*d*x + 12*I*c) + 8902656*I*a^8*e^(24*I*d*x + 10*I*c) + 24220672*I*a^8*e^(2
2*I*d*x + 8*I*c) + 40941824*I*a^8*e^(20*I*d*x + 6*I*c) + 39542272*I*a^8*e^(
18*I*d*x + 4*I*c) + 5795328*I*a^8*e^(16*I*d*x + 2*I*c) - 80602368*I*a^8*e^(
```

```
12*I*d*x - 2*I*c) - 77650944*I*a^8*e^(10*I*d*x - 4*I*c) - 49588224*I*a^8*e^
(8*I*d*x - 6*I*c) - 21590016*I*a^8*e^(6*I*d*x - 8*I*c) - 6212864*I*a^8*e^(4
*I*d*x - 10*I*c) - 1071616*I*a^8*e^(2*I*d*x - 12*I*c) - 46007808*I*a^8*e^(1
4*I*d*x) - 84224*I*a^8*e^(-14*I*c))/(d*e^(28*I*d*x + 14*I*c) + 14*d*e^(26*I
*d*x + 12*I*c) + 91*d*e^(24*I*d*x + 10*I*c) + 364*d*e^(22*I*d*x + 8*I*c) +
1001*d*e^(20*I*d*x + 6*I*c) + 2002*d*e^(18*I*d*x + 4*I*c) + 3003*d*e^(16*I*
d*x + 2*I*c) + 3003*d*e^(12*I*d*x - 2*I*c) + 2002*d*e^(10*I*d*x - 4*I*c) +
1001*d*e^(8*I*d*x - 6*I*c) + 364*d*e^(6*I*d*x - 8*I*c) + 91*d*e^(4*I*d*x -
10*I*c) + 14*d*e^(2*I*d*x - 12*I*c) + 3432*d*e^(14*I*d*x) + d*e^(-14*I*c))
```

maple [B] time = 0.65, size = 306, normalized size = 2.47

$$-\frac{2a^8\cos(dx+c)\left(\sin^7(dx+c)\right)}{d}+\frac{80a^8c}{d}-\frac{4ia^8\left(\sin^6(dx+c)\right)}{d}-\frac{4ia^8\left(\sin^8(dx+c)\right)}{d\cos(dx+c)^2}-\frac{34ia^8\left(\sin^4(dx+c)\right)}{d}-80$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] -2/d*a^8*cos(d*x+c)*sin(d*x+c)^7+80/d*a^8*c-4*I/d*a^8*sin(d*x+c)^6-4*I/d*a^
8*sin(d*x+c)^8/cos(d*x+c)^2-34*I/d*a^8*sin(d*x+c)^4-80*I*a^8*ln(cos(d*x+c))
/d+29/4/d*a^8*cos(d*x+c)^3*sin(d*x+c)-28/d*a^8*sin(d*x+c)^7/cos(d*x+c)+1/3/
d*a^8*sin(d*x+c)^9/cos(d*x+c)^3-2/d*a^8*sin(d*x+c)^9/cos(d*x+c)-91/3/d*a^8*
cos(d*x+c)*sin(d*x+c)^5-665/12/d*a^8*cos(d*x+c)*sin(d*x+c)^3-345/4/d*a^8*si
n(d*x+c)*cos(d*x+c)-2*I/d*a^8*cos(d*x+c)^4+80*a^8*x-40*I/d*a^8*sin(d*x+c)^2
```

maxima [A] time = 0.64, size = 136, normalized size = 1.10

$$\frac{8\,a^8\tan(dx+c)^3-96i\,a^8\tan(dx+c)^2+1920\,(dx+c)a^8+960i\,a^8\log\left(\tan(dx+c)^2+1\right)-744\,a^8\tan(dx+}{24\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] 1/24*(8*a^8*tan(d*x + c)^3 - 96*I*a^8*tan(d*x + c)^2 + 1920*(d*x + c)*a^8 +
 960*I*a^8*log(tan(d*x + c)^2 + 1) - 744*a^8*tan(d*x + c) - 3*(640*a^8*tan(
d*x + c)^3 - 768*I*a^8*tan(d*x + c)^2 + 384*a^8*tan(d*x + c) - 512*I*a^8)/(
tan(d*x + c)^4 + 2*tan(d*x + c)^2 + 1))/d
```

mupad [B] time = 3.37, size = 111, normalized size = 0.90

$$\frac{a^8\tan(c+d\,x)^3}{3\,d}-\frac{80\,a^8\tan(c+d\,x)+a^8\,64\mathrm{i}}{d\left(\tan(c+d\,x)^2+\tan(c+d\,x)\,2\mathrm{i}-1\right)}-\frac{31\,a^8\tan(c+d\,x)}{d}+\frac{a^8\,\ln(\tan(c+d\,x)+1\mathrm{i})\,80\mathrm{i}}{d}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] (a^8*log(tan(c + d*x) + 1i)*80i)/d - (31*a^8*tan(c + d*x))/d - (80*a^8*tan(
c + d*x) + a^8*64i)/(d*(tan(c + d*x)*2i + tan(c + d*x)^2 - 1)) - (a^8*tan(c
 + d*x)^2*4i)/d + (a^8*tan(c + d*x)^3)/(3*d)
```

sympy [A] time = 0.79, size = 216, normalized size = 1.74

$$-\frac{80ia^8\log\left(e^{2idx}+e^{-2ic}\right)}{d}+\frac{240ia^8e^{4ic}e^{4idx}+420ia^8e^{2ic}e^{2idx}+188ia^8}{-3de^{6ic}e^{6idx}-9de^{4ic}e^{4idx}-9de^{2ic}e^{2idx}-3d}+\begin{cases}\frac{-4ia^8de^{4ic}e^{4idx}+32ia^8de^{2ic}e^{2idx}}{d^2} & \text{for } d^2\neq 0\\ x\left(16a^8e^{4ic}-64a^8e^{2ic}\right) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4*(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] -80*I*a**8*log(exp(2*I*d*x) + exp(-2*I*c))/d + (240*I*a**8*exp(4*I*c)*exp(4
*I*d*x) + 420*I*a**8*exp(2*I*c)*exp(2*I*d*x) + 188*I*a**8)/(-3*d*exp(6*I*c)
*exp(6*I*d*x) - 9*d*exp(4*I*c)*exp(4*I*d*x) - 9*d*exp(2*I*c)*exp(2*I*d*x) -
 3*d) + Piecewise(((-4*I*a**8*d*exp(4*I*c)*exp(4*I*d*x) + 32*I*a**8*d*exp(2
*I*c)*exp(2*I*d*x))/d**2, Ne(d**2, 0)), (x*(16*a**8*exp(4*I*c) - 64*a**8*ex
p(2*I*c)), True))
```

3.84 $\int \cos^6(c+dx)(a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=114

$$-\frac{16ia^{11}}{3d(a-ia\tan(c+dx))^3}+\frac{16ia^{10}}{d(a-ia\tan(c+dx))^2}-\frac{24ia^9}{d(a-ia\tan(c+dx))}+\frac{a^8\tan(c+dx)}{d}+\frac{8ia^8\log(\cos(c+dx)}{d}$$

```
[Out] -8*a^8*x+8*I*a^8*ln(cos(d*x+c))/d+a^8*tan(d*x+c)/d-16/3*I*a^11/d/(a-I*a*tan
(d*x+c))^3+16*I*a^10/d/(a-I*a*tan(d*x+c))^2-24*I*a^9/d/(a-I*a*tan(d*x+c))
```

Rubi [A] time = 0.07, antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {3487, 43}

$$-\frac{16ia^{11}}{3d(a-ia\tan(c+dx))^3}+\frac{16ia^{10}}{d(a-ia\tan(c+dx))^2}-\frac{24ia^9}{d(a-ia\tan(c+dx))}+\frac{a^8\tan(c+dx)}{d}+\frac{8ia^8\log(\cos(c+dx)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^6*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] -8*a^8*x + ((8*I)*a^8*Log[Cos[c + d*x]])/d + (a^8*Tan[c + d*x])/d - (((16*I
)/3)*a^11)/(d*(a - I*a*Tan[c + d*x])^3) + ((16*I)*a^10)/(d*(a - I*a*Tan[c +
 d*x])^2) - ((24*I)*a^9)/(d*(a - I*a*Tan[c + d*x]))
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \cos^6(c+dx)(a+ia\tan(c+dx))^8\,dx &= -\frac{\left(ia^7\right)\operatorname{Subst}\left(\int \frac{(a+x)^4}{(a-x)^4}\,dx,x,ia\tan(c+dx)\right)}{d}\\ &= -\frac{\left(ia^7\right)\operatorname{Subst}\left(\int \left(1+\frac{16a^4}{(a-x)^4}-\frac{32a^3}{(a-x)^3}+\frac{24a^2}{(a-x)^2}-\frac{8a}{a-x}\right)dx,x,ia\tan(c+\right.}{d}\\ &= -8a^8x+\frac{8ia^8\log(\cos(c+dx))}{d}+\frac{a^8\tan(c+dx)}{d}-\frac{16ia^{11}}{3d(a-ia\tan(c+}\end{aligned}$$

Mathematica [B] time = 2.71, size = 414, normalized size = 3.63

$$-\frac{a^8\sec(c)\sec(c+dx)(\cos(3c+11dx)+i\sin(3c+11dx))\left(-12idx\sin(c+2dx)+11\sin(c+2dx)-12idx\sin(3\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^6*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] -1/6*(a^8*Sec[c]*Sec[c + d*x]*((12*I)*Cos[c] + (10*I)*Cos[3*c + 2*d*x] + 12
*d*x*Cos[3*c + 2*d*x] - (2*I)*Cos[3*c + 4*d*x] + 12*d*x*Cos[3*c + 4*d*x] +
I*Cos[5*c + 4*d*x] + 12*d*x*Cos[5*c + 4*d*x] + Cos[c + 2*d*x]*(7*I + 12*d*x
 - (6*I)*Log[Cos[c + d*x]^2]) - (6*I)*Cos[3*c + 2*d*x]*Log[Cos[c + d*x]^2]
- (6*I)*Cos[3*c + 4*d*x]*Log[Cos[c + d*x]^2] - (6*I)*Cos[5*c + 4*d*x]*Log[C
os[c + d*x]^2] + 11*Sin[c + 2*d*x] - (12*I)*d*x*Sin[c + 2*d*x] - 6*Log[Cos[
c + d*x]^2]*Sin[c + 2*d*x] + 14*Sin[3*c + 2*d*x] - (12*I)*d*x*Sin[3*c + 2*d
*x] - 6*Log[Cos[c + d*x]^2]*Sin[3*c + 2*d*x] - 4*Sin[3*c + 4*d*x] - (12*I)*
d*x*Sin[3*c + 4*d*x] - 6*Log[Cos[c + d*x]^2]*Sin[3*c + 4*d*x] - Sin[5*c + 4
*d*x] - (12*I)*d*x*Sin[5*c + 4*d*x] - 6*Log[Cos[c + d*x]^2]*Sin[5*c + 4*d*x
])*(Cos[3*c + 11*d*x] + I*Sin[3*c + 11*d*x]))/(d*(Cos[d*x] + I*Sin[d*x])^8)
```

fricas [A] time = 0.62, size = 112, normalized size = 0.98

$$\frac{-2i\,a^8e^{(8i\,dx+8i\,c)}+4i\,a^8e^{(6i\,dx+6i\,c)}-12i\,a^8e^{(4i\,dx+4i\,c)}-18i\,a^8e^{(2i\,dx+2i\,c)}+6i\,a^8+\left(24i\,a^8e^{(2i\,dx+2i\,c)}+24i\,a^8\right)\log\left(e^{(2i}\right.}{3\left(de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/3*(-2*I*a^8*e^(8*I*d*x + 8*I*c) + 4*I*a^8*e^(6*I*d*x + 6*I*c) - 12*I*a^8*
e^(4*I*d*x + 4*I*c) - 18*I*a^8*e^(2*I*d*x + 2*I*c) + 6*I*a^8 + (24*I*a^8*e^
(2*I*d*x + 2*I*c) + 24*I*a^8)*log(e^(2*I*d*x + 2*I*c) + 1))/(d*e^(2*I*d*x +
 2*I*c) + d)
```

giac [B] time = 7.48, size = 799, normalized size = 7.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/13440*(107520*I*a^8*e^(28*I*d*x + 14*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) +
1505280*I*a^8*e^(26*I*d*x + 12*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) + 9784320*
I*a^8*e^(24*I*d*x + 10*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) + 39137280*I*a^8*e
^(22*I*d*x + 8*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) + 107627520*I*a^8*e^(20*I*
d*x + 6*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) + 215255040*I*a^8*e^(18*I*d*x + 4
*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) + 322882560*I*a^8*e^(16*I*d*x + 2*I*c)*l
og(e^(2*I*d*x + 2*I*c) + 1) + 322882560*I*a^8*e^(12*I*d*x - 2*I*c)*log(e^(2
*I*d*x + 2*I*c) + 1) + 215255040*I*a^8*e^(10*I*d*x - 4*I*c)*log(e^(2*I*d*x
+ 2*I*c) + 1) + 107627520*I*a^8*e^(8*I*d*x - 6*I*c)*log(e^(2*I*d*x + 2*I*c)
 + 1) + 39137280*I*a^8*e^(6*I*d*x - 8*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) + 9
784320*I*a^8*e^(4*I*d*x - 10*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) + 1505280*I*
a^8*e^(2*I*d*x - 12*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) + 369008640*I*a^8*e^(
14*I*d*x)*log(e^(2*I*d*x + 2*I*c) + 1) + 107520*I*a^8*e^(-14*I*c)*log(e^(2*
I*d*x + 2*I*c) + 1) - 8960*I*a^8*e^(34*I*d*x + 20*I*c) - 98560*I*a^8*e^(32*
I*d*x + 18*I*c) - 519680*I*a^8*e^(30*I*d*x + 16*I*c) - 1944320*I*a^8*e^(28*
I*d*x + 14*I*c) - 6496000*I*a^8*e^(26*I*d*x + 12*I*c) - 20034560*I*a^8*e^(2
4*I*d*x + 10*I*c) - 51717120*I*a^8*e^(22*I*d*x + 8*I*c) - 103783680*I*a^8*e
^(20*I*d*x + 6*I*c) - 157597440*I*a^8*e^(18*I*d*x + 4*I*c) - 179379200*I*a^
8*e^(16*I*d*x + 2*I*c) - 91669760*I*a^8*e^(12*I*d*x - 2*I*c) - 37157120*I*a
^8*e^(10*I*d*x - 4*I*c) - 7813120*I*a^8*e^(8*I*d*x - 6*I*c) + 716800*I*a^8*
e^(6*I*d*x - 8*I*c) + 994560*I*a^8*e^(4*I*d*x - 10*I*c) + 268800*I*a^8*e^(2
*I*d*x - 12*I*c) - 151191040*I*a^8*e^(14*I*d*x) + 26880*I*a^8*e^(-14*I*c))/
(d*e^(28*I*d*x + 14*I*c) + 14*d*e^(26*I*d*x + 12*I*c) + 91*d*e^(24*I*d*x +
10*I*c) + 364*d*e^(22*I*d*x + 8*I*c) + 1001*d*e^(20*I*d*x + 6*I*c) + 2002*d
*e^(18*I*d*x + 4*I*c) + 3003*d*e^(16*I*d*x + 2*I*c) + 3003*d*e^(12*I*d*x -
2*I*c) + 2002*d*e^(10*I*d*x - 4*I*c) + 1001*d*e^(8*I*d*x - 6*I*c) + 364*d*e
```

```
^(6*I*d*x - 8*I*c) + 91*d*e^(4*I*d*x - 10*I*c) + 14*d*e^(2*I*d*x - 12*I*c)
+ 3432*d*e^(14*I*d*x) + d*e^(-14*I*c))
```

maple [B] time = 0.62, size = 319, normalized size = 2.80

$$\frac{a^8\cos(dx+c)\left(\sin^7(dx+c)\right)}{d}-\frac{8a^8c}{d}+\frac{4ia^8\left(\sin^2(dx+c)\right)}{d}+\frac{29a^8\sin(dx+c)\left(\cos^5(dx+c)\right)}{6d}-\frac{233a^8\left(\cos^3(dx\right.}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/d*a^8*cos(d*x+c)*sin(d*x+c)^7-8/d*a^8*c+4*I/d*a^8*sin(d*x+c)^2+29/6/d*a^8
*sin(d*x+c)*cos(d*x+c)^5-233/24/d*a^8*cos(d*x+c)^3*sin(d*x+c)+111/8/d*a^8*s
in(d*x+c)*cos(d*x+c)+32/3*I/d*a^8*sin(d*x+c)^6+2*I/d*a^8*sin(d*x+c)^4+28/3*
I/d*a^8*sin(d*x+c)^2*cos(d*x+c)^4-35/3/d*a^8*sin(d*x+c)^3*cos(d*x+c)^3+1/d*
a^8*sin(d*x+c)^9/cos(d*x+c)+35/6/d*a^8*cos(d*x+c)*sin(d*x+c)^5+175/24/d*a^8
*cos(d*x+c)*sin(d*x+c)^3+14/3*I/d*a^8*cos(d*x+c)^4+8*I*a^8*ln(cos(d*x+c))/d
-4/3*I/d*a^8*cos(d*x+c)^6-8*a^8*x
```

maxima [A] time = 0.70, size = 146, normalized size = 1.28

$$-\frac{384\,(dx+c)a^8+192i\,a^8\log\left(\tan(dx+c)^2+1\right)-48\,a^8\tan(dx+c)-\frac{1152\,a^8\tan(dx+c)^5-1920i\,a^8\tan(dx+c)^4+512\,a^8\tan}{\tan(dx+c)^6+3\tan}}{48\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] -1/48*(384*(d*x + c)*a^8 + 192*I*a^8*log(tan(d*x + c)^2 + 1) - 48*a^8*tan(d
*x + c) - (1152*a^8*tan(d*x + c)^5 - 1920*I*a^8*tan(d*x + c)^4 + 512*a^8*ta
n(d*x + c)^3 - 1536*I*a^8*tan(d*x + c)^2 + 384*a^8*tan(d*x + c) - 640*I*a^8
)/(tan(d*x + c)^6 + 3*tan(d*x + c)^4 + 3*tan(d*x + c)^2 + 1))/d
```

mupad [B] time = 3.41, size = 103, normalized size = 0.90

$$\frac{a^8\tan(c+d\,x)}{d}-\frac{24\,a^8\tan(c+d\,x)^2+a^8\tan(c+d\,x)\,32\mathrm{i}-\frac{40\,a^8}{3}}{d\,\left(-\tan(c+d\,x)^3-\tan(c+d\,x)^2\,3\mathrm{i}+3\tan(c+d\,x)+1\mathrm{i}\right)}-\frac{a^8\,\ln(\tan(c+d\,x)+1\mathrm{i})\,8\mathrm{i}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] (a^8*tan(c + d*x))/d - (a^8*log(tan(c + d*x) + 1i)*8i)/d - (a^8*tan(c + d*x
)*32i - (40*a^8)/3 + 24*a^8*tan(c + d*x)^2)/(d*(3*tan(c + d*x) - tan(c + d*
x)^2*3i - tan(c + d*x)^3 + 1i))
```

sympy [A] time = 0.84, size = 177, normalized size = 1.55

$$-\frac{2ia^8}{-de^{2ic}e^{2idx}-d}+\frac{8ia^8\log\left(e^{2idx}+e^{-2ic}\right)}{d}+\begin{cases}-\frac{2ia^8d^2e^{6ic}e^{6idx}-6ia^8d^2e^{4ic}e^{4idx}+18ia^8d^2e^{2ic}e^{2idx}}{3d^3} & \text{for } 3d^3\neq 0\\ x\left(4a^8e^{6ic}-8a^8e^{4ic}+12a^8e^{2ic}\right) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**6*(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] -2*I*a**8/(-d*exp(2*I*c)*exp(2*I*d*x) - d) + 8*I*a**8*log(exp(2*I*d*x) + ex
p(-2*I*c))/d + Piecewise((-(2*I*a**8*d**2*exp(6*I*c)*exp(6*I*d*x) - 6*I*a**
8*d**2*exp(4*I*c)*exp(4*I*d*x) + 18*I*a**8*d**2*exp(2*I*c)*exp(2*I*d*x))/(3
*d**3), Ne(3*d**3, 0)), (x*(4*a**8*exp(6*I*c) - 8*a**8*exp(4*I*c) + 12*a**8
*exp(2*I*c)), True))
```

3.85 $\int \cos^8(c+dx)(a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=43

$$-\frac{i\left(a^3+ia^3\tan(c+dx)\right)^4}{8d(a-ia\tan(c+dx))^4}$$

```
[Out] -1/8*I*(a^3+I*a^3*tan(d*x+c))^4/d/(a-I*a*tan(d*x+c))^4
```

Rubi [A] time = 0.04, antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 37}

$$-\frac{i\left(a^3+ia^3\tan(c+dx)\right)^4}{8d(a-ia\tan(c+dx))^4}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^8*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((-I/8)*(a^3 + I*a^3*Tan[c + d*x])^4)/(d*(a - I*a*Tan[c + d*x])^4)
```

Rule 37

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \cos^8(c+dx)(a+ia\tan(c+dx))^8\,dx &= -\frac{\left(ia^9\right)\text{Subst}\left(\int \frac{(a+x)^3}{(a-x)^5}\,dx,x,ia\tan(c+dx)\right)}{d}\\ &= -\frac{i\left(a^3+ia^3\tan(c+dx)\right)^4}{8d(a-ia\tan(c+dx))^4}\end{aligned}$$

Mathematica [A] time = 0.33, size = 31, normalized size = 0.72

$$-\frac{ia^8(\cos(c+dx)+i\sin(c+dx))^8}{8d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^8*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((-1/8*I)*a^8*(Cos[c + d*x] + I*Sin[c + d*x])^8)/d
```

fricas [A] time = 0.56, size = 17, normalized size = 0.40

$$-\frac{i\,a^8e^{(8i\,dx+8i\,c)}}{8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^8*(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] -1/8*I*a^8*e^(8*I*d*x + 8*I*c)/d
```

giac [B] time = 11.98, size = 381, normalized size = 8.86

$$\frac{-3840i\,a^8e^{(36i\,dx+22i\,c)} - 53760i\,a^8e^{(34i\,dx+20i\,c)} - 349440i\,a^8e^{(32i\,dx+18i\,c)} - 1397760i\,a^8e^{(30i\,dx+16i\,c)} - 3843840i\,a^8 \cdots}{30720\left(de^{(28i\,dx+14i\,c)} + 14\,de^{(26i\,dx+12i\,c)} + 91\,de^{(24i\,dx+10i\,c)} + 364 \cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^8*(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/30720*(-3840*I*a^8*e^(36*I*d*x + 22*I*c) - 53760*I*a^8*e^(34*I*d*x + 20*I
*c) - 349440*I*a^8*e^(32*I*d*x + 18*I*c) - 1397760*I*a^8*e^(30*I*d*x + 16*I
*c) - 3843840*I*a^8*e^(28*I*d*x + 14*I*c) - 7687680*I*a^8*e^(26*I*d*x + 12*
I*c) - 11531520*I*a^8*e^(24*I*d*x + 10*I*c) - 13178880*I*a^8*e^(22*I*d*x +
8*I*c) - 11531520*I*a^8*e^(20*I*d*x + 6*I*c) - 7687680*I*a^8*e^(18*I*d*x +
4*I*c) - 3843840*I*a^8*e^(16*I*d*x + 2*I*c) - 349440*I*a^8*e^(12*I*d*x - 2*
I*c) - 53760*I*a^8*e^(10*I*d*x - 4*I*c) - 3840*I*a^8*e^(8*I*d*x - 6*I*c) -
1397760*I*a^8*e^(14*I*d*x))/(d*e^(28*I*d*x + 14*I*c) + 14*d*e^(26*I*d*x + 1
2*I*c) + 91*d*e^(24*I*d*x + 10*I*c) + 364*d*e^(22*I*d*x + 8*I*c) + 1001*d*e
^(20*I*d*x + 6*I*c) + 2002*d*e^(18*I*d*x + 4*I*c) + 3003*d*e^(16*I*d*x + 2*
I*c) + 3003*d*e^(12*I*d*x - 2*I*c) + 2002*d*e^(10*I*d*x - 4*I*c) + 1001*d*e
^(8*I*d*x - 6*I*c) + 364*d*e^(6*I*d*x - 8*I*c) + 91*d*e^(4*I*d*x - 10*I*c)
+ 14*d*e^(2*I*d*x - 12*I*c) + 3432*d*e^(14*I*d*x) + d*e^(-14*I*c))
```

maple [B] time = 0.62, size = 451, normalized size = 10.49

$$a^8\left(-\frac{\left(\sin^7(dx+c)+\frac{7\left(\sin^5(dx+c)\right)}{6}+\frac{35\left(\sin^3(dx+c)\right)}{24}+\frac{35\sin(dx+c)}{16}\right)\cos(dx+c)}{8}+\frac{35dx}{128}+\frac{35c}{128}\right) - ia^8\left(\sin^8(dx+c)\right) - 28a^8\left(-\frac{\left(\sin^5(dx+c)\right) \cdots}{8 \cdots}\right. \cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^8*(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/d*(a^8*(-1/8*(sin(d*x+c)^7+7/6*sin(d*x+c)^5+35/24*sin(d*x+c)^3+35/16*sin(
d*x+c))*cos(d*x+c)+35/128*d*x+35/128*c)-I*a^8*sin(d*x+c)^8-28*a^8*(-1/8*sin
(d*x+c)^5*cos(d*x+c)^3-5/48*sin(d*x+c)^3*cos(d*x+c)^3-5/64*sin(d*x+c)*cos(d
*x+c)^3+5/128*cos(d*x+c)*sin(d*x+c)+5/128*d*x+5/128*c)+56*I*a^8*(-1/8*sin(d
*x+c)^4*cos(d*x+c)^4-1/12*sin(d*x+c)^2*cos(d*x+c)^4-1/24*cos(d*x+c)^4)+70*a
^8*(-1/8*sin(d*x+c)^3*cos(d*x+c)^5-1/16*sin(d*x+c)*cos(d*x+c)^5+1/64*(cos(d
*x+c)^3+3/2*cos(d*x+c))*sin(d*x+c)+3/128*d*x+3/128*c)-56*I*a^8*(-1/8*sin(d*
x+c)^2*cos(d*x+c)^6-1/24*cos(d*x+c)^6)-28*a^8*(-1/8*sin(d*x+c)*cos(d*x+c)^7
+1/48*(cos(d*x+c)^5+5/4*cos(d*x+c)^3+15/8*cos(d*x+c))*sin(d*x+c)+5/128*d*x+
5/128*c)-I*a^8*cos(d*x+c)^8+a^8*(1/8*(cos(d*x+c)^7+7/6*cos(d*x+c)^5+35/24*c
os(d*x+c)^3+35/16*cos(d*x+c))*sin(d*x+c)+35/128*d*x+35/128*c))
```

maxima [B] time = 0.77, size = 137, normalized size = 3.19

$$-\frac{384\,a^8\tan(dx+c)^7 - 1536i\,a^8\tan(dx+c)^6 - 2688\,a^8\tan(dx+c)^5 + 3072i\,a^8\tan(dx+c)^4 + 2688\,a^8\tan(\cdots}{384\left(\tan(dx+c)^8 + 4\,\tan(dx+c)^6 + 6\,\tan(dx+c)^4 + 4\,\tan(dx \cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^8*(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] -1/384*(384*a^8*tan(d*x + c)^7 - 1536*I*a^8*tan(d*x + c)^6 - 2688*a^8*tan(d
*x + c)^5 + 3072*I*a^8*tan(d*x + c)^4 + 2688*a^8*tan(d*x + c)^3 - 1536*I*a^
8*tan(d*x + c)^2 - 384*a^8*tan(d*x + c))/((tan(d*x + c)^8 + 4*tan(d*x + c)^
6 + 6*tan(d*x + c)^4 + 4*tan(d*x + c)^2 + 1)*d)
```

mupad [B] time = 3.48, size = 66, normalized size = 1.53

$$-\frac{a^8 \tan(c+d\,x)\,\left(\tan(c+d\,x)^2-1\right)}{d\,\left(\tan(c+d\,x)^4+\tan(c+d\,x)^3\,4\mathrm{i}-6\tan(c+d\,x)^2-\tan(c+d\,x)\,4\mathrm{i}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^8*(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] -(a^8*tan(c + d*x)*(tan(c + d*x)^2 - 1))/(d*(tan(c + d*x)^3*4i - 6*tan(c +
d*x)^2 - tan(c + d*x)*4i + tan(c + d*x)^4 + 1))
```

sympy [A] time = 0.74, size = 37, normalized size = 0.86

$$\begin{cases} -\frac{ia^8 e^{8ic} e^{8idx}}{8d} & \text{for } 8d \neq 0 \\ a^8 x e^{8ic} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**8*(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Piecewise((-I*a**8*exp(8*I*c)*exp(8*I*d*x)/(8*d), Ne(8*d, 0)), (a**8*x*exp(
8*I*c), True))
```

3.86 $\int \cos^{10}(c+dx)(a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=80

$$-\frac{4ia^{13}}{5d(a-ia\tan(c+dx))^5}+\frac{ia^{12}}{d(a-ia\tan(c+dx))^4}-\frac{ia^{11}}{3d(a-ia\tan(c+dx))^3}$$

```
[Out] -4/5*I*a^13/d/(a-I*a*tan(d*x+c))^5+I*a^12/d/(a-I*a*tan(d*x+c))^4-1/3*I*a^11
/d/(a-I*a*tan(d*x+c))^3
```

Rubi [A] time = 0.06, antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$-\frac{4ia^{13}}{5d(a-ia\tan(c+dx))^5}+\frac{ia^{12}}{d(a-ia\tan(c+dx))^4}-\frac{ia^{11}}{3d(a-ia\tan(c+dx))^3}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^10*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (((-4*I)/5)*a^13)/(d*(a - I*a*Tan[c + d*x])^5) + (I*a^12)/(d*(a - I*a*Tan[c
 + d*x])^4) - ((I/3)*a^11)/(d*(a - I*a*Tan[c + d*x])^3)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \cos^{10}(c+dx)(a+ia\tan(c+dx))^8\,dx &= -\frac{\left(ia^{11}\right)\operatorname{Subst}\left(\int \frac{(a+x)^2}{(a-x)^6}\,dx,x,ia\tan(c+dx)\right)}{d}\\ &= -\frac{\left(ia^{11}\right)\operatorname{Subst}\left(\int \left(\frac{4a^2}{(a-x)^6}-\frac{4a}{(a-x)^5}+\frac{1}{(a-x)^4}\right)dx,x,ia\tan(c+dx)\right)}{d}\\ &= -\frac{4ia^{13}}{5d(a-ia\tan(c+dx))^5}+\frac{ia^{12}}{d(a-ia\tan(c+dx))^4}-\frac{ia^{11}}{3d(a-ia\tan(c\end{aligned}$$

Mathematica [A] time = 1.45, size = 55, normalized size = 0.69

$$\frac{a^8(-4i\sin(2(c+dx))+16\cos(2(c+dx))+15)(\sin(8(c+dx))-i\cos(8(c+dx)))}{240d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^10*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (a^8*(15 + 16*Cos[2*(c + d*x)] - (4*I)*Sin[2*(c + d*x)])*((-I)*Cos[8*(c + d
*x)] + Sin[8*(c + d*x)]))/(240*d)
```

fricas [A] time = 0.68, size = 48, normalized size = 0.60

$$\frac{-6i\,a^8e^{(10i\,dx+10i\,c)} - 15i\,a^8e^{(8i\,dx+8i\,c)} - 10i\,a^8e^{(6i\,dx+6i\,c)}}{240\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^10*(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/240*(-6*I*a^8*e^(10*I*d*x + 10*I*c) - 15*I*a^8*e^(8*I*d*x + 8*I*c) - 10*I
*a^8*e^(6*I*d*x + 6*I*c))/d
```

giac [B] time = 13.55, size = 409, normalized size = 5.11

$$\frac{-10752i\,a^8e^{(38i\,dx+24i\,c)} - 177408i\,a^8e^{(36i\,dx+22i\,c)} - 1372672i\,a^8e^{(34i\,dx+20i\,c)} - 6610688i\,a^8e^{(32i\,dx+18i\,c)} - 22177792i}{430080\left(de^{(28i\,dx+14i\,c)} + 14\,de^{(26i}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^10*(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/430080*(-10752*I*a^8*e^(38*I*d*x + 24*I*c) - 177408*I*a^8*e^(36*I*d*x + 2
2*I*c) - 1372672*I*a^8*e^(34*I*d*x + 20*I*c) - 6610688*I*a^8*e^(32*I*d*x +
18*I*c) - 22177792*I*a^8*e^(30*I*d*x + 16*I*c) - 54955264*I*a^8*e^(28*I*d*x
 + 14*I*c) - 104039936*I*a^8*e^(26*I*d*x + 12*I*c) - 153497344*I*a^8*e^(24*
I*d*x + 10*I*c) - 178354176*I*a^8*e^(22*I*d*x + 8*I*c) - 163747584*I*a^8*e^
(20*I*d*x + 6*I*c) - 118390272*I*a^8*e^(18*I*d*x + 4*I*c) - 66696448*I*a^8*
e^(16*I*d*x + 2*I*c) - 9119488*I*a^8*e^(12*I*d*x - 2*I*c) - 2017792*I*a^8*e
^(10*I*d*x - 4*I*c) - 277760*I*a^8*e^(8*I*d*x - 6*I*c) - 17920*I*a^8*e^(6*I
*d*x - 8*I*c) - 28700672*I*a^8*e^(14*I*d*x))/(d*e^(28*I*d*x + 14*I*c) + 14*
d*e^(26*I*d*x + 12*I*c) + 91*d*e^(24*I*d*x + 10*I*c) + 364*d*e^(22*I*d*x +
8*I*c) + 1001*d*e^(20*I*d*x + 6*I*c) + 2002*d*e^(18*I*d*x + 4*I*c) + 3003*d
*e^(16*I*d*x + 2*I*c) + 3003*d*e^(12*I*d*x - 2*I*c) + 2002*d*e^(10*I*d*x -
4*I*c) + 1001*d*e^(8*I*d*x - 6*I*c) + 364*d*e^(6*I*d*x - 8*I*c) + 91*d*e^(4
*I*d*x - 10*I*c) + 14*d*e^(2*I*d*x - 12*I*c) + 3432*d*e^(14*I*d*x) + d*e^(-
14*I*c))
```

maple [B] time = 0.69, size = 588, normalized size = 7.35

$$a^8\left(-\frac{\left(\sin^7(dx+c)\right)\left(\cos^3(dx+c)\right)}{10} - \frac{7\left(\sin^5(dx+c)\right)\left(\cos^3(dx+c)\right)}{80} - \frac{7\left(\sin^3(dx+c)\right)\left(\cos^3(dx+c)\right)}{96} - \frac{7\sin(dx+c)\left(\cos^3(dx+c)\right)}{128} + \frac{7\cos(dx+c)\sin(dx+c}{256}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^10*(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/d*(a^8*(-1/10*sin(d*x+c)^7*cos(d*x+c)^3-7/80*sin(d*x+c)^5*cos(d*x+c)^3-7/
96*sin(d*x+c)^3*cos(d*x+c)^3-7/128*sin(d*x+c)*cos(d*x+c)^3+7/256*cos(d*x+c)
*sin(d*x+c)+7/256*d*x+7/256*c)-8*I*a^8*(-1/10*sin(d*x+c)^6*cos(d*x+c)^4-3/4
0*sin(d*x+c)^4*cos(d*x+c)^4-1/20*sin(d*x+c)^2*cos(d*x+c)^4-1/40*cos(d*x+c)^
4)-28*a^8*(-1/10*sin(d*x+c)^5*cos(d*x+c)^5-1/16*sin(d*x+c)^3*cos(d*x+c)^5-1
/32*sin(d*x+c)*cos(d*x+c)^5+1/128*(cos(d*x+c)^3+3/2*cos(d*x+c))*sin(d*x+c)+
3/256*d*x+3/256*c)+56*I*a^8*(-1/10*sin(d*x+c)^4*cos(d*x+c)^6-1/20*sin(d*x+c
)^2*cos(d*x+c)^6-1/60*cos(d*x+c)^6)+70*a^8*(-1/10*sin(d*x+c)^3*cos(d*x+c)^7
-3/80*sin(d*x+c)*cos(d*x+c)^7+1/160*(cos(d*x+c)^5+5/4*cos(d*x+c)^3+15/8*cos
(d*x+c))*sin(d*x+c)+3/256*d*x+3/256*c)-56*I*a^8*(-1/10*sin(d*x+c)^2*cos(d*x
```

```
+c)^8-1/40*cos(d*x+c)^8)-28*a^8*(-1/10*sin(d*x+c)*cos(d*x+c)^9+1/80*(cos(d*
x+c)^7+7/6*cos(d*x+c)^5+35/24*cos(d*x+c)^3+35/16*cos(d*x+c))*sin(d*x+c)+7/2
56*d*x+7/256*c)-4/5*I*a^8*cos(d*x+c)^10+a^8*(1/10*(cos(d*x+c)^9+9/8*cos(d*x
+c)^7+21/16*cos(d*x+c)^5+105/64*cos(d*x+c)^3+315/128*cos(d*x+c))*sin(d*x+c)
+63/256*d*x+63/256*c))
```

maxima [B] time = 0.84, size = 152, normalized size = 1.90

$$-\frac{1280\,a^8\tan(dx+c)^7-7680i\,a^8\tan(dx+c)^6-19712\,a^8\tan(dx+c)^5+28160i\,a^8\tan(dx+c)^4+24320\,a^8\,\mathrm{t}}{3840\left(\tan(dx+c)^{10}+5\,\tan(dx+c)^8+10\,\tan(dx+c)^6+10\,\tan(d\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^10*(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] -1/3840*(1280*a^8*tan(d*x + c)^7 - 7680*I*a^8*tan(d*x + c)^6 - 19712*a^8*ta
n(d*x + c)^5 + 28160*I*a^8*tan(d*x + c)^4 + 24320*a^8*tan(d*x + c)^3 - 1280
0*I*a^8*tan(d*x + c)^2 - 3840*a^8*tan(d*x + c) + 512*I*a^8)/((tan(d*x + c)^
10 + 5*tan(d*x + c)^8 + 10*tan(d*x + c)^6 + 10*tan(d*x + c)^4 + 5*tan(d*x +
 c)^2 + 1)*d)
```

mupad [B] time = 3.48, size = 82, normalized size = 1.02

$$\frac{a^8\left(-5\tan(c+d\,x)^2+\tan(c+d\,x)\,5\mathrm{i}+2\right)}{15\,d\,\left(\tan(c+d\,x)^5+\tan(c+d\,x)^4\,5\mathrm{i}-10\tan(c+d\,x)^3-\tan(c+d\,x)^2\,10\mathrm{i}+5\tan(c+d\,x)+1\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^10*(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] (a^8*(tan(c + d*x)*5i - 5*tan(c + d*x)^2 + 2))/(15*d*(5*tan(c + d*x) - tan(
c + d*x)^2*10i - 10*tan(c + d*x)^3 + tan(c + d*x)^4*5i + tan(c + d*x)^5 + 1
i))
```

sympy [A] time = 1.00, size = 122, normalized size = 1.52

$$\begin{cases} -\frac{384ia^8d^2e^{10ic}e^{10idx}+960ia^8d^2e^{8ic}e^{8idx}+640ia^8d^2e^{6ic}e^{6idx}}{15360d^3} & \text{for } 15360d^3 \neq 0 \\ x\left(\frac{a^8e^{10ic}}{4}+\frac{a^8e^{8ic}}{2}+\frac{a^8e^{6ic}}{4}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**10*(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Piecewise((-(384*I*a**8*d**2*exp(10*I*c)*exp(10*I*d*x) + 960*I*a**8*d**2*ex
p(8*I*c)*exp(8*I*d*x) + 640*I*a**8*d**2*exp(6*I*c)*exp(6*I*d*x))/(15360*d**
3), Ne(15360*d**3, 0)), (x*(a**8*exp(10*I*c)/4 + a**8*exp(8*I*c)/2 + a**8*e
xp(6*I*c)/4), True))
```

3.87 $\int \cos^{12}(c+dx)(a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=55

$$\frac{ia^{13}}{5d(a-ia\tan(c+dx))^5}-\frac{ia^{14}}{3d(a-ia\tan(c+dx))^6}$$

```
[Out] -1/3*I*a^14/d/(a-I*a*tan(d*x+c))^6+1/5*I*a^13/d/(a-I*a*tan(d*x+c))^5
```

Rubi [A] time = 0.05, antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{ia^{13}}{5d(a-ia\tan(c+dx))^5}-\frac{ia^{14}}{3d(a-ia\tan(c+dx))^6}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^12*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((-I/3)*a^14)/(d*(a - I*a*Tan[c + d*x])^6) + ((I/5)*a^13)/(d*(a - I*a*Tan[c
 + d*x])^5)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \cos^{12}(c+dx)(a+ia\tan(c+dx))^8\,dx &= -\frac{\left(ia^{13}\right)\text{Subst}\left(\int \frac{a+x}{(a-x)^7}\,dx,x,ia\tan(c+dx)\right)}{d}\\ &= -\frac{\left(ia^{13}\right)\text{Subst}\left(\int \left(\frac{2a}{(a-x)^7}-\frac{1}{(a-x)^6}\right)dx,x,ia\tan(c+dx)\right)}{d}\\ &= -\frac{ia^{14}}{3d(a-ia\tan(c+dx))^6}+\frac{ia^{13}}{5d(a-ia\tan(c+dx))^5}\end{aligned}$$

Mathematica [A] time = 1.47, size = 77, normalized size = 1.40

$$\frac{a^8(-16i\sin(2(c+dx))-10i\sin(4(c+dx))+64\cos(2(c+dx))+20\cos(4(c+dx))+45)(\sin(8(c+dx))-i\cos(8}{960d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^12*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (a^8*(45 + 64*Cos[2*(c + d*x)] + 20*Cos[4*(c + d*x)] - (16*I)*Sin[2*(c + d*
x)] - (10*I)*Sin[4*(c + d*x)])*((-I)*Cos[8*(c + d*x)] + Sin[8*(c + d*x)]))/
(960*d)
```

fricas [A] time = 0.70, size = 76, normalized size = 1.38

$$\frac{-5i\,a^8e^{(12i\,dx+12i\,c)} - 24i\,a^8e^{(10i\,dx+10i\,c)} - 45i\,a^8e^{(8i\,dx+8i\,c)} - 40i\,a^8e^{(6i\,dx+6i\,c)} - 15i\,a^8e^{(4i\,dx+4i\,c)}}{960\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^12*(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/960*(-5*I*a^8*e^(12*I*d*x + 12*I*c) - 24*I*a^8*e^(10*I*d*x + 10*I*c) - 45
*I*a^8*e^(8*I*d*x + 8*I*c) - 40*I*a^8*e^(6*I*d*x + 6*I*c) - 15*I*a^8*e^(4*I
*d*x + 4*I*c))/d
```

giac [B] time = 15.23, size = 437, normalized size = 7.95

$$\frac{-8960i\,a^8e^{(40i\,dx+26i\,c)} - 168448i\,a^8e^{(38i\,dx+24i\,c)} - 1498112i\,a^8e^{(36i\,dx+22i\,c)} - 8375808i\,a^8e^{(34i\,dx+20i\,c)} - 32992512}{1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^12*(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/1720320*(-8960*I*a^8*e^(40*I*d*x + 26*I*c) - 168448*I*a^8*e^(38*I*d*x + 2
4*I*c) - 1498112*I*a^8*e^(36*I*d*x + 22*I*c) - 8375808*I*a^8*e^(34*I*d*x +
20*I*c) - 32992512*I*a^8*e^(32*I*d*x + 18*I*c) - 97241088*I*a^8*e^(30*I*d*x
 + 16*I*c) - 222267136*I*a^8*e^(28*I*d*x + 14*I*c) - 402881024*I*a^8*e^(26*
I*d*x + 12*I*c) - 587082496*I*a^8*e^(24*I*d*x + 10*I*c) - 692916224*I*a^8*e
^(22*I*d*x + 8*I*c) - 663959296*I*a^8*e^(20*I*d*x + 6*I*c) - 515260928*I*a^
8*e^(18*I*d*x + 4*I*c) - 321414912*I*a^8*e^(16*I*d*x + 2*I*c) - 60947712*I*
a^8*e^(12*I*d*x - 2*I*c) - 17479168*I*a^8*e^(10*I*d*x - 4*I*c) - 3530240*I*
a^8*e^(8*I*d*x - 6*I*c) - 448000*I*a^8*e^(6*I*d*x - 8*I*c) - 26880*I*a^8*e^
(4*I*d*x - 10*I*c) - 158957568*I*a^8*e^(14*I*d*x))/(d*e^(28*I*d*x + 14*I*c)
 + 14*d*e^(26*I*d*x + 12*I*c) + 91*d*e^(24*I*d*x + 10*I*c) + 364*d*e^(22*I*
d*x + 8*I*c) + 1001*d*e^(20*I*d*x + 6*I*c) + 2002*d*e^(18*I*d*x + 4*I*c) +
3003*d*e^(16*I*d*x + 2*I*c) + 3003*d*e^(12*I*d*x - 2*I*c) + 2002*d*e^(10*I*
d*x - 4*I*c) + 1001*d*e^(8*I*d*x - 6*I*c) + 364*d*e^(6*I*d*x - 8*I*c) + 91*
d*e^(4*I*d*x - 10*I*c) + 14*d*e^(2*I*d*x - 12*I*c) + 3432*d*e^(14*I*d*x) +
d*e^(-14*I*c))
```

maple [B] time = 0.76, size = 639, normalized size = 11.62

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^12*(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/d*(a^8*(-1/12*sin(d*x+c)^7*cos(d*x+c)^5-7/120*sin(d*x+c)^5*cos(d*x+c)^5-7
/192*sin(d*x+c)^3*cos(d*x+c)^5-7/384*sin(d*x+c)*cos(d*x+c)^5+7/1536*(cos(d*
x+c)^3+3/2*cos(d*x+c))*sin(d*x+c)+7/1024*d*x+7/1024*c)-8*I*a^8*(-1/12*sin(d
*x+c)^6*cos(d*x+c)^6-1/20*sin(d*x+c)^4*cos(d*x+c)^6-1/40*sin(d*x+c)^2*cos(d
*x+c)^6-1/120*cos(d*x+c)^6)-28*a^8*(-1/12*sin(d*x+c)^5*cos(d*x+c)^7-1/24*si
n(d*x+c)^3*cos(d*x+c)^7-1/64*sin(d*x+c)*cos(d*x+c)^7+1/384*(cos(d*x+c)^5+5/
4*cos(d*x+c)^3+15/8*cos(d*x+c))*sin(d*x+c)+5/1024*d*x+5/1024*c)+56*I*a^8*(-
1/12*sin(d*x+c)^4*cos(d*x+c)^8-1/30*sin(d*x+c)^2*cos(d*x+c)^8-1/120*cos(d*x
+c)^8)+70*a^8*(-1/12*sin(d*x+c)^3*cos(d*x+c)^9-1/40*sin(d*x+c)*cos(d*x+c)^9
+1/320*(cos(d*x+c)^7+7/6*cos(d*x+c)^5+35/24*cos(d*x+c)^3+35/16*cos(d*x+c))*
sin(d*x+c)+7/1024*d*x+7/1024*c)-56*I*a^8*(-1/12*sin(d*x+c)^2*cos(d*x+c)^10-
```

```
1/60*cos(d*x+c)^10)-28*a^8*(-1/12*sin(d*x+c)*cos(d*x+c)^11+1/120*(cos(d*x+c
)^9+9/8*cos(d*x+c)^7+21/16*cos(d*x+c)^5+105/64*cos(d*x+c)^3+315/128*cos(d*x
+c))*sin(d*x+c)+21/1024*d*x+21/1024*c)-2/3*I*a^8*cos(d*x+c)^12+a^8*(1/12*(c
os(d*x+c)^11+11/10*cos(d*x+c)^9+99/80*cos(d*x+c)^7+231/160*cos(d*x+c)^5+231
/128*cos(d*x+c)^3+693/256*cos(d*x+c))*sin(d*x+c)+231/1024*d*x+231/1024*c))
```

maxima [B] time = 0.90, size = 162, normalized size = 2.95

$$-\frac{3072\,a^8\tan(dx+c)^7-20480i\,a^8\tan(dx+c)^6-58368\,a^8\tan(dx+c)^5+92160i\,a^8\tan(dx+c)^4+87040\,a^8\tan}{15360\left(\tan(dx+c)^{12}+6\,\tan(dx+c)^{10}+15\,\tan(dx+c)^8+20\,\tan(dx+c)^6+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^12*(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] -1/15360*(3072*a^8*tan(d*x + c)^7 - 20480*I*a^8*tan(d*x + c)^6 - 58368*a^8*
tan(d*x + c)^5 + 92160*I*a^8*tan(d*x + c)^4 + 87040*a^8*tan(d*x + c)^3 - 49
152*I*a^8*tan(d*x + c)^2 - 15360*a^8*tan(d*x + c) + 2048*I*a^8)/((tan(d*x +
 c)^12 + 6*tan(d*x + c)^10 + 15*tan(d*x + c)^8 + 20*tan(d*x + c)^6 + 15*tan
(d*x + c)^4 + 6*tan(d*x + c)^2 + 1)*d)
```

mupad [B] time = 3.40, size = 82, normalized size = 1.49

$$-\frac{a^8\,\left(3\tan(c+d\,x)-2\mathrm{i}\right)}{15\,d\,\left(\tan(c+d\,x)^6+\tan(c+d\,x)^5\,6\mathrm{i}-15\tan(c+d\,x)^4-\tan(c+d\,x)^3\,20\mathrm{i}+15\tan(c+d\,x)^2+\tan(c+d\,x)\,6\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^12*(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] -(a^8*(3*tan(c + d*x) - 2i))/(15*d*(tan(c + d*x)*6i + 15*tan(c + d*x)^2 - t
an(c + d*x)^3*20i - 15*tan(c + d*x)^4 + tan(c + d*x)^5*6i + tan(c + d*x)^6
- 1))
```

sympy [A] time = 1.18, size = 199, normalized size = 3.62

$$\begin{cases} -\frac{3932160ia^8d^4e^{12ic}e^{12idx}+18874368ia^8d^4e^{10ic}e^{10idx}+35389440ia^8d^4e^{8ic}e^{8idx}+31457280ia^8d^4e^{6ic}e^{6idx}+11796480ia^8d^4e^{4ic}e^{4idx}}{754974720d^5} & \text{for } 75497472 \\ x\left(\frac{a^8e^{12ic}}{16}+\frac{a^8e^{10ic}}{4}+\frac{3a^8e^{8ic}}{8}+\frac{a^8e^{6ic}}{4}+\frac{a^8e^{4ic}}{16}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**12*(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Piecewise((-(3932160*I*a**8*d**4*exp(12*I*c)*exp(12*I*d*x) + 18874368*I*a**
8*d**4*exp(10*I*c)*exp(10*I*d*x) + 35389440*I*a**8*d**4*exp(8*I*c)*exp(8*I*
d*x) + 31457280*I*a**8*d**4*exp(6*I*c)*exp(6*I*d*x) + 11796480*I*a**8*d**4*
exp(4*I*c)*exp(4*I*d*x))/(754974720*d**5), Ne(754974720*d**5, 0)), (x*(a**8
*exp(12*I*c)/16 + a**8*exp(10*I*c)/4 + 3*a**8*exp(8*I*c)/8 + a**8*exp(6*I*c
)/4 + a**8*exp(4*I*c)/16), True))
```

3.88 $\int \cos^{14}(c+dx)(a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=27

$$-\frac{ia^{15}}{7d(a-ia\tan(c+dx))^7}$$

```
[Out] -1/7*I*a^15/d/(a-I*a*tan(d*x+c))^7
```

Rubi [A] time = 0.04, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = $\{3487, 32\}$

$$-\frac{ia^{15}}{7d(a-ia\tan(c+dx))^7}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^14*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((-I/7)*a^15)/(d*(a - I*a*Tan[c + d*x])^7)
```

Rule 32

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \cos^{14}(c+dx)(a+ia\tan(c+dx))^8\,dx &= -\frac{\left(ia^{15}\right)\text{Subst}\left(\int \frac{1}{(a-x)^8}\,dx, x, ia\tan(c+dx)\right)}{d}\\ &= -\frac{ia^{15}}{7d(a-ia\tan(c+dx))^7}\end{aligned}$$

Mathematica [B] time = 2.01, size = 116, normalized size = 4.30

$$\frac{a^8(-14i\sin(2(c+dx))-14i\sin(4(c+dx))-6i\sin(6(c+dx))+56\cos(2(c+dx))+28\cos(4(c+dx))+8\cos}{896d(\cos(dx)+i\sin(dx))^8}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^14*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (a^8*(35 + 56*Cos[2*(c + d*x)] + 28*Cos[4*(c + d*x)] + 8*Cos[6*(c + d*x)] -
 (14*I)*Sin[2*(c + d*x)] - (14*I)*Sin[4*(c + d*x)] - (6*I)*Sin[6*(c + d*x)]
)*((-I)*Cos[8*(c + 2*d*x)] + Sin[8*(c + 2*d*x)]))/(896*d*(Cos[d*x] + I*Sin[
d*x])^8)
```

fricas [B] time = 0.64, size = 104, normalized size = 3.85

$$\frac{-i\,a^8e^{(14i\,dx+14i\,c)}-7i\,a^8e^{(12i\,dx+12i\,c)}-21i\,a^8e^{(10i\,dx+10i\,c)}-35i\,a^8e^{(8i\,dx+8i\,c)}-35i\,a^8e^{(6i\,dx+6i\,c)}-21i\,a^8e^{(4i\,dx+4i\,c)}-}{896\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^14*(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/896*(-I*a^8*e^(14*I*d*x + 14*I*c) - 7*I*a^8*e^(12*I*d*x + 12*I*c) - 21*I*
a^8*e^(10*I*d*x + 10*I*c) - 35*I*a^8*e^(8*I*d*x + 8*I*c) - 35*I*a^8*e^(6*I*
d*x + 6*I*c) - 21*I*a^8*e^(4*I*d*x + 4*I*c) - 7*I*a^8*e^(2*I*d*x + 2*I*c))/
d
```

giac [B] time = 17.00, size = 465, normalized size = 17.22

$$-3840i\,a^8e^{(42i\,dx+28i\,c)} - 80640i\,a^8e^{(40i\,dx+26i\,c)} - 806400i\,a^8e^{(38i\,dx+24i\,c)} - 5107200i\,a^8e^{(36i\,dx+22i\,c)} - 22982400i\,a^8e^{(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^14*(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/3440640*(-3840*I*a^8*e^(42*I*d*x + 28*I*c) - 80640*I*a^8*e^(40*I*d*x + 26
*I*c) - 806400*I*a^8*e^(38*I*d*x + 24*I*c) - 5107200*I*a^8*e^(36*I*d*x + 22
*I*c) - 22982400*I*a^8*e^(34*I*d*x + 20*I*c) - 78140160*I*a^8*e^(32*I*d*x +
 18*I*c) - 208373760*I*a^8*e^(30*I*d*x + 16*I*c) - 446511360*I*a^8*e^(28*I*
d*x + 14*I*c) - 781347840*I*a^8*e^(26*I*d*x + 12*I*c) - 1128341760*I*a^8*e^
(24*I*d*x + 10*I*c) - 1353031680*I*a^8*e^(22*I*d*x + 8*I*c) - 1350585600*I*
a^8*e^(20*I*d*x + 6*I*c) - 1121003520*I*a^8*e^(18*I*d*x + 4*I*c) - 76987008
0*I*a^8*e^(16*I*d*x + 2*I*c) - 196842240*I*a^8*e^(12*I*d*x - 2*I*c) - 70452
480*I*a^8*e^(10*I*d*x - 4*I*c) - 19138560*I*a^8*e^(8*I*d*x - 6*I*c) - 37094
40*I*a^8*e^(6*I*d*x - 8*I*c) - 456960*I*a^8*e^(4*I*d*x - 10*I*c) - 26880*I*
a^8*e^(2*I*d*x - 12*I*c) - 433336320*I*a^8*e^(14*I*d*x))/(d*e^(28*I*d*x + 1
4*I*c) + 14*d*e^(26*I*d*x + 12*I*c) + 91*d*e^(24*I*d*x + 10*I*c) + 364*d*e^
(22*I*d*x + 8*I*c) + 1001*d*e^(20*I*d*x + 6*I*c) + 2002*d*e^(18*I*d*x + 4*I
*c) + 3003*d*e^(16*I*d*x + 2*I*c) + 3003*d*e^(12*I*d*x - 2*I*c) + 2002*d*e^
(10*I*d*x - 4*I*c) + 1001*d*e^(8*I*d*x - 6*I*c) + 364*d*e^(6*I*d*x - 8*I*c)
 + 91*d*e^(4*I*d*x - 10*I*c) + 14*d*e^(2*I*d*x - 12*I*c) + 3432*d*e^(14*I*d
*x) + d*e^(-14*I*c))
```

maple [B] time = 0.77, size = 689, normalized size = 25.52

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^14*(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/d*(a^8*(-1/14*sin(d*x+c)^7*cos(d*x+c)^7-1/24*sin(d*x+c)^5*cos(d*x+c)^7-1/
48*sin(d*x+c)^3*cos(d*x+c)^7-1/128*sin(d*x+c)*cos(d*x+c)^7+1/768*(cos(d*x+c
)^5+5/4*cos(d*x+c)^3+15/8*cos(d*x+c))*sin(d*x+c)+5/2048*d*x+5/2048*c)-8*I*a
^8*(-1/14*sin(d*x+c)^6*cos(d*x+c)^8-1/28*sin(d*x+c)^4*cos(d*x+c)^8-1/70*sin
(d*x+c)^2*cos(d*x+c)^8-1/280*cos(d*x+c)^8)-28*a^8*(-1/14*sin(d*x+c)^5*cos(d
*x+c)^9-5/168*sin(d*x+c)^3*cos(d*x+c)^9-1/112*sin(d*x+c)*cos(d*x+c)^9+1/896
*(cos(d*x+c)^7+7/6*cos(d*x+c)^5+35/24*cos(d*x+c)^3+35/16*cos(d*x+c))*sin(d*
x+c)+5/2048*d*x+5/2048*c)+56*I*a^8*(-1/14*sin(d*x+c)^4*cos(d*x+c)^10-1/42*s
in(d*x+c)^2*cos(d*x+c)^10-1/210*cos(d*x+c)^10)+70*a^8*(-1/14*sin(d*x+c)^3*c
os(d*x+c)^11-1/56*sin(d*x+c)*cos(d*x+c)^11+1/560*(cos(d*x+c)^9+9/8*cos(d*x+
c)^7+21/16*cos(d*x+c)^5+105/64*cos(d*x+c)^3+315/128*cos(d*x+c))*sin(d*x+c)+
9/2048*d*x+9/2048*c)-56*I*a^8*(-1/14*sin(d*x+c)^2*cos(d*x+c)^12-1/84*cos(d*
x+c)^12)-28*a^8*(-1/14*sin(d*x+c)*cos(d*x+c)^13+1/168*(cos(d*x+c)^11+11/10*
cos(d*x+c)^9+99/80*cos(d*x+c)^7+231/160*cos(d*x+c)^5+231/128*cos(d*x+c)^3+6
93/256*cos(d*x+c))*sin(d*x+c)+33/2048*d*x+33/2048*c)-4/7*I*a^8*cos(d*x+c)^1
4+a^8*(1/14*(cos(d*x+c)^13+13/12*cos(d*x+c)^11+143/120*cos(d*x+c)^9+429/320
*cos(d*x+c)^7+1001/640*cos(d*x+c)^5+1001/512*cos(d*x+c)^3+3003/1024*cos(d*x
+c))*sin(d*x+c)+429/2048*d*x+429/2048*c))
```

maxima [B] time = 0.67, size = 172, normalized size = 6.37

$$-\frac{30720\,a^8\tan(dx+c)^7 - 215040i\,a^8\tan(dx+c)^6 - 645120\,a^8\tan(dx+c)^5 + 1075200i\,a^8\tan(dx+c)^4 + 10}{215040\left(\tan(dx+c)^{14} + 7\,\tan(dx+c)^{12} + 21\,\tan(dx+c)^{10} + 35\,\tan(dx+c)^8 +\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^14*(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] -1/215040*(30720*a^8*tan(d*x + c)^7 - 215040*I*a^8*tan(d*x + c)^6 - 645120*
a^8*tan(d*x + c)^5 + 1075200*I*a^8*tan(d*x + c)^4 + 1075200*a^8*tan(d*x + c
)^3 - 645120*I*a^8*tan(d*x + c)^2 - 215040*a^8*tan(d*x + c) + 30720*I*a^8)/
((tan(d*x + c)^14 + 7*tan(d*x + c)^12 + 21*tan(d*x + c)^10 + 35*tan(d*x + c
)^8 + 35*tan(d*x + c)^6 + 21*tan(d*x + c)^4 + 7*tan(d*x + c)^2 + 1)*d)
```

mupad [B] time = 3.38, size = 105, normalized size = 3.89

$$-\frac{a^8\cos(c+d\,x)^8\,\left(\tan(c+d\,x)-7\mathrm{i}\right)}{7\,d}+\frac{64\,a^8\cos(c+d\,x)^{14}\,\left(\tan(c+d\,x)-\mathrm{i}\right)}{7\,d}+\frac{8\,a^8\cos(c+d\,x)^{10}\,\left(3\tan(c+\right.}{7\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^14*(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] (64*a^8*cos(c + d*x)^14*(tan(c + d*x) - 1i))/(7*d) - (a^8*cos(c + d*x)^8*(t
an(c + d*x) - 7i))/(7*d) + (8*a^8*cos(c + d*x)^10*(3*tan(c + d*x) - 7i))/(7
*d) - (16*a^8*cos(c + d*x)^12*(5*tan(c + d*x) - 7i))/(7*d)
```

sympy [B] time = 1.38, size = 280, normalized size = 10.37

$$\begin{cases} -\frac{4398046511104ia^8d^6e^{14ic}e^{14idx}+30786325577728ia^8d^6e^{12ic}e^{12idx}+92358976733184ia^8d^6e^{10ic}e^{10idx}+153931627888640ia^8d^6e^{8ic}e^{8idx}+1539316}{3940649673949184d^7} \\ x\left(\frac{a^8e^{14ic}}{64}+\frac{3a^8e^{12ic}}{32}+\frac{15a^8e^{10ic}}{64}+\frac{5a^8e^{8ic}}{16}+\frac{15a^8e^{6ic}}{64}+\frac{3a^8e^{4ic}}{32}+\frac{a^8e^{2ic}}{64}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**14*(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Piecewise((-(4398046511104*I*a**8*d**6*exp(14*I*c)*exp(14*I*d*x) + 30786325
577728*I*a**8*d**6*exp(12*I*c)*exp(12*I*d*x) + 92358976733184*I*a**8*d**6*e
xp(10*I*c)*exp(10*I*d*x) + 153931627888640*I*a**8*d**6*exp(8*I*c)*exp(8*I*d
*x) + 153931627888640*I*a**8*d**6*exp(6*I*c)*exp(6*I*d*x) + 92358976733184*
I*a**8*d**6*exp(4*I*c)*exp(4*I*d*x) + 30786325577728*I*a**8*d**6*exp(2*I*c)
*exp(2*I*d*x))/(3940649673949184*d**7), Ne(3940649673949184*d**7, 0)), (x*(
a**8*exp(14*I*c)/64 + 3*a**8*exp(12*I*c)/32 + 15*a**8*exp(10*I*c)/64 + 5*a*
*8*exp(8*I*c)/16 + 15*a**8*exp(6*I*c)/64 + 3*a**8*exp(4*I*c)/32 + a**8*exp(
2*I*c)/64), True))
```

3.89 $\int \cos^{16}(c+dx)(a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=225

$$-\frac{ia^{16}}{16d(a-ia\tan(c+dx))^8}-\frac{ia^{15}}{28d(a-ia\tan(c+dx))^7}-\frac{ia^{14}}{48d(a-ia\tan(c+dx))^6}-\frac{ia^{13}}{80d(a-ia\tan(c+dx))^5}-\frac{}{128d(a}$$

```
[Out] 1/256*a^8*x-1/16*I*a^16/d/(a-I*a*tan(d*x+c))^8-1/28*I*a^15/d/(a-I*a*tan(d*x
+c))^7-1/48*I*a^14/d/(a-I*a*tan(d*x+c))^6-1/80*I*a^13/d/(a-I*a*tan(d*x+c))^
5-1/128*I*a^12/d/(a-I*a*tan(d*x+c))^4-1/192*I*a^11/d/(a-I*a*tan(d*x+c))^3-1
/256*I*a^10/d/(a-I*a*tan(d*x+c))^2-1/256*I*a^9/d/(a-I*a*tan(d*x+c))
```

Rubi [A] time = 0.12, antiderivative size = 225, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {3487, 44, 206}

$$-\frac{ia^{16}}{16d(a-ia\tan(c+dx))^8}-\frac{ia^{15}}{28d(a-ia\tan(c+dx))^7}-\frac{ia^{14}}{48d(a-ia\tan(c+dx))^6}-\frac{ia^{13}}{80d(a-ia\tan(c+dx))^5}-\frac{}{128d(a}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^16*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (a^8*x)/256 - ((I/16)*a^16)/(d*(a - I*a*Tan[c + d*x])^8) - ((I/28)*a^15)/(d
*(a - I*a*Tan[c + d*x])^7) - ((I/48)*a^14)/(d*(a - I*a*Tan[c + d*x])^6) - (
(I/80)*a^13)/(d*(a - I*a*Tan[c + d*x])^5) - ((I/128)*a^12)/(d*(a - I*a*Tan[
c + d*x])^4) - ((I/192)*a^11)/(d*(a - I*a*Tan[c + d*x])^3) - ((I/256)*a^10)
/(d*(a - I*a*Tan[c + d*x])^2) - ((I/256)*a^9)/(d*(a - I*a*Tan[c + d*x]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 206

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^{16}(c+dx)(a+ia\tan(c+dx))^8\,dx = -\frac{\left(ia^{17}\right)\text{Subst}\left(\int \frac{1}{(a-x)^9(a+x)}\,dx, x, ia\tan(c+dx)\right)}{d}$$
$$= -\frac{\left(ia^{17}\right)\text{Subst}\left(\int \left(\frac{1}{2a(a-x)^9}+\frac{1}{4a^2(a-x)^8}+\frac{1}{8a^3(a-x)^7}+\frac{1}{16a^4(a-x)^6}+\frac{1}{32a^5(a}\right.\right.}{}$$
$$= -\frac{ia^{16}}{16d(a-ia\tan(c+dx))^8}-\frac{ia^{15}}{28d(a-ia\tan(c+dx))^7}-\frac{ia}{48d(a-ia\text{t}}$$
$$= \frac{a^8x}{256}-\frac{ia^{16}}{16d(a-ia\tan(c+dx))^8}-\frac{ia^{15}}{28d(a-ia\tan(c+dx))^7}-\frac{}{48d(a}$$

Mathematica [A] time = 6.77, size = 166, normalized size = 0.74

$$\frac{a^8(-6272\sin(2(c+dx))-7840\sin(4(c+dx))-5760\sin(6(c+dx))-1680idx\sin(8(c+dx))+105\sin(8(c+}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^16*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (a^8*(-14700*I - (25088*I)*Cos[2*(c + d*x)] - (15680*I)*Cos[4*(c + d*x)] -
(7680*I)*Cos[6*(c + d*x)] - (105*I)*Cos[8*(c + d*x)] + 1680*d*x*Cos[8*(c +
d*x)] - 6272*Sin[2*(c + d*x)] - 7840*Sin[4*(c + d*x)] - 5760*Sin[6*(c + d*x
)] + 105*Sin[8*(c + d*x)] - (1680*I)*d*x*Sin[8*(c + d*x)])*(Cos[8*(c + 2*d*
x)] + I*Sin[8*(c + 2*d*x)]))/(430080*d*(Cos[d*x] + I*Sin[d*x])^8)
```

fricas [A] time = 0.64, size = 125, normalized size = 0.56

$$\frac{1680\,a^8dx-105i\,a^8e^{(16i\,dx+16i\,c)}-960i\,a^8e^{(14i\,dx+14i\,c)}-3920i\,a^8e^{(12i\,dx+12i\,c)}-9408i\,a^8e^{(10i\,dx+10i\,c)}-14700i\,a^8e^{}}{430080\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^16*(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/430080*(1680*a^8*d*x - 105*I*a^8*e^(16*I*d*x + 16*I*c) - 960*I*a^8*e^(14*
I*d*x + 14*I*c) - 3920*I*a^8*e^(12*I*d*x + 12*I*c) - 9408*I*a^8*e^(10*I*d*x
 + 10*I*c) - 14700*I*a^8*e^(8*I*d*x + 8*I*c) - 15680*I*a^8*e^(6*I*d*x + 6*I
*c) - 11760*I*a^8*e^(4*I*d*x + 4*I*c) - 6720*I*a^8*e^(2*I*d*x + 2*I*c))/d
```

giac [B] time = 18.05, size = 1457, normalized size = 6.48

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^16*(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/55050240*(215040*a^8*d*x*e^(28*I*d*x + 14*I*c) + 3010560*a^8*d*x*e^(26*I*
d*x + 12*I*c) + 19568640*a^8*d*x*e^(24*I*d*x + 10*I*c) + 78274560*a^8*d*x*e
^(22*I*d*x + 8*I*c) + 215255040*a^8*d*x*e^(20*I*d*x + 6*I*c) + 430510080*a^
8*d*x*e^(18*I*d*x + 4*I*c) + 645765120*a^8*d*x*e^(16*I*d*x + 2*I*c) + 64576
5120*a^8*d*x*e^(12*I*d*x - 2*I*c) + 430510080*a^8*d*x*e^(10*I*d*x - 4*I*c)
+ 215255040*a^8*d*x*e^(8*I*d*x - 6*I*c) + 78274560*a^8*d*x*e^(6*I*d*x - 8*I
*c) + 19568640*a^8*d*x*e^(4*I*d*x - 10*I*c) + 3010560*a^8*d*x*e^(2*I*d*x -
12*I*c) + 738017280*a^8*d*x*e^(14*I*d*x) + 215040*a^8*d*x*e^(-14*I*c) - 103
740*I*a^8*e^(28*I*d*x + 14*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 1452360*I*a^
```

```
8*e^(26*I*d*x + 12*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 9440340*I*a^8*e^(24*
I*d*x + 10*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 37761360*I*a^8*e^(22*I*d*x +
 8*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 103843740*I*a^8*e^(20*I*d*x + 6*I*c)
*log(e^(2*I*d*x + 2*I*c) + 1) - 207687480*I*a^8*e^(18*I*d*x + 4*I*c)*log(e^
(2*I*d*x + 2*I*c) + 1) - 311531220*I*a^8*e^(16*I*d*x + 2*I*c)*log(e^(2*I*d*
x + 2*I*c) + 1) - 311531220*I*a^8*e^(12*I*d*x - 2*I*c)*log(e^(2*I*d*x + 2*I
*c) + 1) - 207687480*I*a^8*e^(10*I*d*x - 4*I*c)*log(e^(2*I*d*x + 2*I*c) + 1
) - 103843740*I*a^8*e^(8*I*d*x - 6*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 3776
1360*I*a^8*e^(6*I*d*x - 8*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 9440340*I*a^8
*e^(4*I*d*x - 10*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 1452360*I*a^8*e^(2*I*d
*x - 12*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 356035680*I*a^8*e^(14*I*d*x)*lo
g(e^(2*I*d*x + 2*I*c) + 1) - 103740*I*a^8*e^(-14*I*c)*log(e^(2*I*d*x + 2*I*
c) + 1) + 103740*I*a^8*e^(28*I*d*x + 14*I*c)*log(e^(2*I*d*x) + e^(-2*I*c))
+ 1452360*I*a^8*e^(26*I*d*x + 12*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 94403
40*I*a^8*e^(24*I*d*x + 10*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 37761360*I*a
^8*e^(22*I*d*x + 8*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 103843740*I*a^8*e^(
20*I*d*x + 6*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 207687480*I*a^8*e^(18*I*d
*x + 4*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 311531220*I*a^8*e^(16*I*d*x + 2
*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 311531220*I*a^8*e^(12*I*d*x - 2*I*c)*
log(e^(2*I*d*x) + e^(-2*I*c)) + 207687480*I*a^8*e^(10*I*d*x - 4*I*c)*log(e^
(2*I*d*x) + e^(-2*I*c)) + 103843740*I*a^8*e^(8*I*d*x - 6*I*c)*log(e^(2*I*d*
x) + e^(-2*I*c)) + 37761360*I*a^8*e^(6*I*d*x - 8*I*c)*log(e^(2*I*d*x) + e^(
-2*I*c)) + 9440340*I*a^8*e^(4*I*d*x - 10*I*c)*log(e^(2*I*d*x) + e^(-2*I*c))
 + 1452360*I*a^8*e^(2*I*d*x - 12*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 35603
5680*I*a^8*e^(14*I*d*x)*log(e^(2*I*d*x) + e^(-2*I*c)) + 103740*I*a^8*e^(-14
*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) - 13440*I*a^8*e^(44*I*d*x + 30*I*c) - 3
11040*I*a^8*e^(42*I*d*x + 28*I*c) - 3445120*I*a^8*e^(40*I*d*x + 26*I*c) - 2
4303104*I*a^8*e^(38*I*d*x + 24*I*c) - 122582656*I*a^8*e^(36*I*d*x + 22*I*c)
 - 470484224*I*a^8*e^(34*I*d*x + 20*I*c) - 1427794816*I*a^8*e^(32*I*d*x + 1
8*I*c) - 3514563584*I*a^8*e^(30*I*d*x + 16*I*c) - 7142793088*I*a^8*e^(28*I*
d*x + 14*I*c) - 12136447232*I*a^8*e^(26*I*d*x + 12*I*c) - 17387563648*I*a^8
*e^(24*I*d*x + 10*I*c) - 21108086272*I*a^8*e^(22*I*d*x + 8*I*c) - 217400718
08*I*a^8*e^(20*I*d*x + 6*I*c) - 18942724864*I*a^8*e^(18*I*d*x + 4*I*c) - 13
859732096*I*a^8*e^(16*I*d*x + 2*I*c) - 4147974656*I*a^8*e^(12*I*d*x - 2*I*c
) - 1619129344*I*a^8*e^(10*I*d*x - 4*I*c) - 480058880*I*a^8*e^(8*I*d*x - 6*
I*c) - 101355520*I*a^8*e^(6*I*d*x - 8*I*c) - 13547520*I*a^8*e^(4*I*d*x - 10
*I*c) - 860160*I*a^8*e^(2*I*d*x - 12*I*c) - 8407312384*I*a^8*e^(14*I*d*x))/
(d*e^(28*I*d*x + 14*I*c) + 14*d*e^(26*I*d*x + 12*I*c) + 91*d*e^(24*I*d*x +
10*I*c) + 364*d*e^(22*I*d*x + 8*I*c) + 1001*d*e^(20*I*d*x + 6*I*c) + 2002*d
*e^(18*I*d*x + 4*I*c) + 3003*d*e^(16*I*d*x + 2*I*c) + 3003*d*e^(12*I*d*x -
2*I*c) + 2002*d*e^(10*I*d*x - 4*I*c) + 1001*d*e^(8*I*d*x - 6*I*c) + 364*d*e
^(6*I*d*x - 8*I*c) + 91*d*e^(4*I*d*x - 10*I*c) + 14*d*e^(2*I*d*x - 12*I*c)
+ 3432*d*e^(14*I*d*x) + d*e^(-14*I*c))
```

maple [B] time = 0.77, size = 739, normalized size = 3.28

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^16*(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/d*(a^8*(-1/16*sin(d*x+c)^7*cos(d*x+c)^9-1/32*sin(d*x+c)^5*cos(d*x+c)^9-5/
384*sin(d*x+c)^3*cos(d*x+c)^9-1/256*sin(d*x+c)*cos(d*x+c)^9+1/2048*(cos(d*x
+c)^7+7/6*cos(d*x+c)^5+35/24*cos(d*x+c)^3+35/16*cos(d*x+c))*sin(d*x+c)+35/3
2768*d*x+35/32768*c)-8*I*a^8*(-1/16*sin(d*x+c)^6*cos(d*x+c)^10-3/112*sin(d*
x+c)^4*cos(d*x+c)^10-1/112*sin(d*x+c)^2*cos(d*x+c)^10-1/560*cos(d*x+c)^10)-
28*a^8*(-1/16*sin(d*x+c)^5*cos(d*x+c)^11-5/224*sin(d*x+c)^3*cos(d*x+c)^11-5
/896*sin(d*x+c)*cos(d*x+c)^11+1/1792*(cos(d*x+c)^9+9/8*cos(d*x+c)^7+21/16*c
os(d*x+c)^5+105/64*cos(d*x+c)^3+315/128*cos(d*x+c))*sin(d*x+c)+45/32768*d*x
+45/32768*c)+56*I*a^8*(-1/16*sin(d*x+c)^4*cos(d*x+c)^12-1/56*sin(d*x+c)^2*c
```

```
os(d*x+c)^12-1/336*cos(d*x+c)^12)+70*a^8*(-1/16*sin(d*x+c)^3*cos(d*x+c)^13-
3/224*sin(d*x+c)*cos(d*x+c)^13+1/896*(cos(d*x+c)^11+11/10*cos(d*x+c)^9+99/8
0*cos(d*x+c)^7+231/160*cos(d*x+c)^5+231/128*cos(d*x+c)^3+693/256*cos(d*x+c)
)*sin(d*x+c)+99/32768*d*x+99/32768*c)-56*I*a^8*(-1/16*sin(d*x+c)^2*cos(d*x+
c)^14-1/112*cos(d*x+c)^14)-28*a^8*(-1/16*cos(d*x+c)^15*sin(d*x+c)+1/224*(co
s(d*x+c)^13+13/12*cos(d*x+c)^11+143/120*cos(d*x+c)^9+429/320*cos(d*x+c)^7+1
001/640*cos(d*x+c)^5+1001/512*cos(d*x+c)^3+3003/1024*cos(d*x+c))*sin(d*x+c)
+429/32768*d*x+429/32768*c)-1/2*I*a^8*cos(d*x+c)^16+a^8*(1/16*(cos(d*x+c)^1
5+15/14*cos(d*x+c)^13+65/56*cos(d*x+c)^11+143/112*cos(d*x+c)^9+1287/896*cos
(d*x+c)^7+429/256*cos(d*x+c)^5+2145/1024*cos(d*x+c)^3+6435/2048*cos(d*x+c))
*sin(d*x+c)+6435/32768*d*x+6435/32768*c))
```

maxima [A] time = 0.46, size = 246, normalized size = 1.09

$$\frac{13440\,(dx+c)a^8 + \frac{13440\,a^8\tan(dx+c)^{15}+103040\,a^8\tan(dx+c)^{13}+343168\,a^8\tan(dx+c)^{11}+646784\,a^8\tan(dx+c)^9+369024\,a^8\tan(dx+c)^7+27}{\tan(dx+c)^{16}+8\,\tan(dx+c)^{14}+28\,\tan(dx+c)^{12}}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^16*(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] 1/3440640*(13440*(d*x + c)*a^8 + (13440*a^8*tan(d*x + c)^15 + 103040*a^8*ta
n(d*x + c)^13 + 343168*a^8*tan(d*x + c)^11 + 646784*a^8*tan(d*x + c)^9 + 36
9024*a^8*tan(d*x + c)^7 + 2752512*I*a^8*tan(d*x + c)^6 + 9061248*a^8*tan(d*
x + c)^5 - 14680064*I*a^8*tan(d*x + c)^4 - 15012480*a^8*tan(d*x + c)^3 + 95
68256*I*a^8*tan(d*x + c)^2 + 3427200*a^8*tan(d*x + c) - 524288*I*a^8)/(tan(
d*x + c)^16 + 8*tan(d*x + c)^14 + 28*tan(d*x + c)^12 + 56*tan(d*x + c)^10 +
 70*tan(d*x + c)^8 + 56*tan(d*x + c)^6 + 28*tan(d*x + c)^4 + 8*tan(d*x + c)
^2 + 1))/d
```

mupad [B] time = 4.85, size = 195, normalized size = 0.87

$$\frac{a^8\,x}{256}-\frac{-\frac{a^8\tan(c+d\,x)^7}{256}-\frac{a^8\tan(c+d\,x)^6\,1\mathrm{i}}{32}+\frac{85\,a^8\tan(c+d\,x)^5}{768}+\frac{a^8\tan(c+d\,x)^4\,11\mathrm{i}}{48}-\frac{1193\,a^8\tan(c+d\,x)^3}{3840}-\frac{a^8\tan(c}{}}{d\,\left(\tan(c+d\,x)^8+\tan(c+d\,x)^7\,8\mathrm{i}-28\tan(c+d\,x)^6-\tan(c+d\,x)^5\,56\mathrm{i}+70\tan(c+d\,x)^4+\tan(c+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^16*(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] (a^8*x)/256 - ((5993*a^8*tan(c + d*x))/26880 + (a^8*16i)/105 - (a^8*tan(c +
 d*x)^2*143i)/480 - (1193*a^8*tan(c + d*x)^3)/3840 + (a^8*tan(c + d*x)^4*11
i)/48 + (85*a^8*tan(c + d*x)^5)/768 - (a^8*tan(c + d*x)^6*1i)/32 - (a^8*tan
(c + d*x)^7)/256)/(d*(tan(c + d*x)^3*56i - 28*tan(c + d*x)^2 - tan(c + d*x)
*8i + 70*tan(c + d*x)^4 - tan(c + d*x)^5*56i - 28*tan(c + d*x)^6 + tan(c +
d*x)^7*8i + tan(c + d*x)^8 + 1))
```

sympy [A] time = 1.53, size = 325, normalized size = 1.44

$$\frac{a^8x}{256}+\begin{cases}\frac{-354658470655426560ia^8d^7e^{16ic}e^{16idx}-3242591731706757120ia^8d^7e^{14ic}e^{14idx}-13240582904469258240ia^8d^7e^{12ic}e^{12idx}-3177739897072}{} \\ x\left(\frac{a^8e^{16ic}}{256}+\frac{a^8e^{14ic}}{32}+\frac{7a^8e^{12ic}}{64}+\frac{7a^8e^{10ic}}{32}+\frac{35a^8e^{8ic}}{128}+\frac{7a^8e^{6ic}}{32}+\frac{7a^8e^{4ic}}{64}+\frac{a^8e^{2ic}}{32}\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**16*(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] a**8*x/256 + Piecewise(((-354658470655426560*I*a**8*d**7*exp(16*I*c)*exp(16
*I*d*x) - 3242591731706757120*I*a**8*d**7*exp(14*I*c)*exp(14*I*d*x) - 13240
582904469258240*I*a**8*d**7*exp(12*I*c)*exp(12*I*d*x) - 3177739897072621977
```

```
6*I*a**8*d**7*exp(10*I*c)*exp(10*I*d*x) - 49652185891759718400*I*a**8*d**7*
exp(8*I*c)*exp(8*I*d*x) - 52962331617877032960*I*a**8*d**7*exp(6*I*c)*exp(6
*I*d*x) - 39721748713407774720*I*a**8*d**7*exp(4*I*c)*exp(4*I*d*x) - 226981
42121947299840*I*a**8*d**7*exp(2*I*c)*exp(2*I*d*x))/(1452681095804627189760
*d**8), Ne(1452681095804627189760*d**8, 0)), (x*(a**8*exp(16*I*c)/256 + a**
8*exp(14*I*c)/32 + 7*a**8*exp(12*I*c)/64 + 7*a**8*exp(10*I*c)/32 + 35*a**8*
exp(8*I*c)/128 + 7*a**8*exp(6*I*c)/32 + 7*a**8*exp(4*I*c)/64 + a**8*exp(2*I
*c)/32), True))
```

3.90 $\int \cos^{18}(c+dx)(a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=279

$$-\frac{ia^{17}}{36d(a-ia\tan(c+dx))^9}-\frac{ia^{16}}{32d(a-ia\tan(c+dx))^8}-\frac{3ia^{15}}{112d(a-ia\tan(c+dx))^7}-\frac{ia^{14}}{48d(a-ia\tan(c+dx))^6}-\frac{}{64d}$$

```
[Out] 5/512*a^8*x-1/36*I*a^17/d/(a-I*a*tan(d*x+c))^9-1/32*I*a^16/d/(a-I*a*tan(d*x
+c))^8-3/112*I*a^15/d/(a-I*a*tan(d*x+c))^7-1/48*I*a^14/d/(a-I*a*tan(d*x+c))
^6-1/64*I*a^13/d/(a-I*a*tan(d*x+c))^5-3/256*I*a^12/d/(a-I*a*tan(d*x+c))^4-7
/768*I*a^11/d/(a-I*a*tan(d*x+c))^3-1/128*I*a^10/d/(a-I*a*tan(d*x+c))^2-9/10
24*I*a^9/d/(a-I*a*tan(d*x+c))+1/1024*I*a^9/d/(a+I*a*tan(d*x+c))
```

Rubi [A] time = 0.16, antiderivative size = 279, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {3487, 44, 206}

$$-\frac{ia^{17}}{36d(a-ia\tan(c+dx))^9}-\frac{ia^{16}}{32d(a-ia\tan(c+dx))^8}-\frac{3ia^{15}}{112d(a-ia\tan(c+dx))^7}-\frac{ia^{14}}{48d(a-ia\tan(c+dx))^6}-\frac{}{64d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^18*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (5*a^8*x)/512 - ((I/36)*a^17)/(d*(a - I*a*Tan[c + d*x])^9) - ((I/32)*a^16)/
(d*(a - I*a*Tan[c + d*x])^8) - (((3*I)/112)*a^15)/(d*(a - I*a*Tan[c + d*x])
^7) - ((I/48)*a^14)/(d*(a - I*a*Tan[c + d*x])^6) - ((I/64)*a^13)/(d*(a - I*
a*Tan[c + d*x])^5) - (((3*I)/256)*a^12)/(d*(a - I*a*Tan[c + d*x])^4) - (((7
*I)/768)*a^11)/(d*(a - I*a*Tan[c + d*x])^3) - ((I/128)*a^10)/(d*(a - I*a*Ta
n[c + d*x])^2) - (((9*I)/1024)*a^9)/(d*(a - I*a*Tan[c + d*x])) + ((I/1024)*
a^9)/(d*(a + I*a*Tan[c + d*x]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 206

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^{18}(c+dx)(a+ia\tan(c+dx))^8\,dx = -\frac{(ia^{19})\,\text{Subst}\left(\int \frac{1}{(a-x)^{10}(a+x)^2}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{(ia^{19})\,\text{Subst}\left(\int \left(\frac{1}{4a^2(a-x)^{10}} + \frac{1}{4a^3(a-x)^9} + \frac{3}{16a^4(a-x)^8} + \frac{1}{8a^5(a-x)^7} + \frac{5}{64a^6(a-}\right.\right.}{}$$

$$= -\frac{ia^{17}}{36d(a-ia\tan(c+dx))^9} - \frac{ia^{16}}{32d(a-ia\tan(c+dx))^8} - \frac{3ia^{1}}{112d(a-ia\tan}$$

$$= \frac{5a^8x}{512} - \frac{ia^{17}}{36d(a-ia\tan(c+dx))^9} - \frac{ia^{16}}{32d(a-ia\tan(c+dx))^8} - \frac{}{112d(a-}$$

Mathematica [A] time = 7.97, size = 188, normalized size = 0.67

$$\frac{a^8(-7056\sin(2(c+dx)) - 10080\sin(4(c+dx)) - 9720\sin(6(c+dx)) - 5040idx\sin(8(c+dx)) + 315\sin(8(c+d}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^18*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (a^8*(-15876*I - (28224*I)*Cos[2*(c + d*x)] - (20160*I)*Cos[4*(c + d*x)] -
(12960*I)*Cos[6*(c + d*x)] - (315*I)*Cos[8*(c + d*x)] + 5040*d*x*Cos[8*(c +
 d*x)] + (224*I)*Cos[10*(c + d*x)] - 7056*Sin[2*(c + d*x)] - 10080*Sin[4*(c
 + d*x)] - 9720*Sin[6*(c + d*x)] + 315*Sin[8*(c + d*x)] - (5040*I)*d*x*Sin[
8*(c + d*x)] + 280*Sin[10*(c + d*x)])*(Cos[8*(c + 2*d*x)] + I*Sin[8*(c + 2*
d*x)]))/(516096*d*(Cos[d*x] + I*Sin[d*x])^8)
```

fricas [A] time = 0.71, size = 162, normalized size = 0.58

$$\frac{\left(5040\,a^8dxe^{(2i\,dx+2i\,c)} - 28i\,a^8e^{(20i\,dx+20i\,c)} - 315i\,a^8e^{(18i\,dx+18i\,c)} - 1620i\,a^8e^{(16i\,dx+16i\,c)} - 5040i\,a^8e^{(14i\,dx+14i\,c)} - 1058\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^18*(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/516096*(5040*a^8*d*x*e^(2*I*d*x + 2*I*c) - 28*I*a^8*e^(20*I*d*x + 20*I*c)
 - 315*I*a^8*e^(18*I*d*x + 18*I*c) - 1620*I*a^8*e^(16*I*d*x + 16*I*c) - 504
0*I*a^8*e^(14*I*d*x + 14*I*c) - 10584*I*a^8*e^(12*I*d*x + 12*I*c) - 15876*I
*a^8*e^(10*I*d*x + 10*I*c) - 17640*I*a^8*e^(8*I*d*x + 8*I*c) - 15120*I*a^8*
e^(6*I*d*x + 6*I*c) - 11340*I*a^8*e^(4*I*d*x + 4*I*c) + 252*I*a^8)*e^(-2*I*
d*x - 2*I*c)/d
```

giac [B] time = 23.63, size = 1514, normalized size = 5.43

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^18*(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/330301440*(3225600*a^8*d*x*e^(30*I*d*x + 16*I*c) + 45158400*a^8*d*x*e^(28
*I*d*x + 14*I*c) + 293529600*a^8*d*x*e^(26*I*d*x + 12*I*c) + 1174118400*a^8
*d*x*e^(24*I*d*x + 10*I*c) + 3228825600*a^8*d*x*e^(22*I*d*x + 8*I*c) + 6457
651200*a^8*d*x*e^(20*I*d*x + 6*I*c) + 9686476800*a^8*d*x*e^(18*I*d*x + 4*I*
c) + 11070259200*a^8*d*x*e^(16*I*d*x + 2*I*c) + 6457651200*a^8*d*x*e^(12*I*
d*x - 2*I*c) + 3228825600*a^8*d*x*e^(10*I*d*x - 4*I*c) + 1174118400*a^8*d*x
```

```
*e^(8*I*d*x - 6*I*c) + 293529600*a^8*d*x*e^(6*I*d*x - 8*I*c) + 45158400*a^8
*d*x*e^(4*I*d*x - 10*I*c) + 3225600*a^8*d*x*e^(2*I*d*x - 12*I*c) + 96864768
00*a^8*d*x*e^(14*I*d*x) - 1515780*I*a^8*e^(30*I*d*x + 16*I*c)*log(e^(2*I*d*
x + 2*I*c) + 1) - 21220920*I*a^8*e^(28*I*d*x + 14*I*c)*log(e^(2*I*d*x + 2*I
*c) + 1) - 137935980*I*a^8*e^(26*I*d*x + 12*I*c)*log(e^(2*I*d*x + 2*I*c) +
1) - 551743920*I*a^8*e^(24*I*d*x + 10*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 1
517295780*I*a^8*e^(22*I*d*x + 8*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 3034591
560*I*a^8*e^(20*I*d*x + 6*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 4551887340*I*
a^8*e^(18*I*d*x + 4*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 5202156960*I*a^8*e^
(16*I*d*x + 2*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 3034591560*I*a^8*e^(12*I*
d*x - 2*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 1517295780*I*a^8*e^(10*I*d*x -
4*I*c)*log(e^(2*I*d*x + 2*I*c) + 1) - 551743920*I*a^8*e^(8*I*d*x - 6*I*c)*l
og(e^(2*I*d*x + 2*I*c) + 1) - 137935980*I*a^8*e^(6*I*d*x - 8*I*c)*log(e^(2*
I*d*x + 2*I*c) + 1) - 21220920*I*a^8*e^(4*I*d*x - 10*I*c)*log(e^(2*I*d*x +
2*I*c) + 1) - 1515780*I*a^8*e^(2*I*d*x - 12*I*c)*log(e^(2*I*d*x + 2*I*c) +
1) - 4551887340*I*a^8*e^(14*I*d*x)*log(e^(2*I*d*x + 2*I*c) + 1) + 1515780*I
*a^8*e^(30*I*d*x + 16*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 21220920*I*a^8*e
^(28*I*d*x + 14*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 137935980*I*a^8*e^(26*
I*d*x + 12*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 551743920*I*a^8*e^(24*I*d*x
 + 10*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 1517295780*I*a^8*e^(22*I*d*x + 8
*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 3034591560*I*a^8*e^(20*I*d*x + 6*I*c)
*log(e^(2*I*d*x) + e^(-2*I*c)) + 4551887340*I*a^8*e^(18*I*d*x + 4*I*c)*log(
e^(2*I*d*x) + e^(-2*I*c)) + 5202156960*I*a^8*e^(16*I*d*x + 2*I*c)*log(e^(2*
I*d*x) + e^(-2*I*c)) + 3034591560*I*a^8*e^(12*I*d*x - 2*I*c)*log(e^(2*I*d*x
) + e^(-2*I*c)) + 1517295780*I*a^8*e^(10*I*d*x - 4*I*c)*log(e^(2*I*d*x) + e
^(-2*I*c)) + 551743920*I*a^8*e^(8*I*d*x - 6*I*c)*log(e^(2*I*d*x) + e^(-2*I*
c)) + 137935980*I*a^8*e^(6*I*d*x - 8*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 2
1220920*I*a^8*e^(4*I*d*x - 10*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 1515780*
I*a^8*e^(2*I*d*x - 12*I*c)*log(e^(2*I*d*x) + e^(-2*I*c)) + 4551887340*I*a^8
*e^(14*I*d*x)*log(e^(2*I*d*x) + e^(-2*I*c)) - 17920*I*a^8*e^(48*I*d*x + 34*
I*c) - 452480*I*a^8*e^(46*I*d*x + 32*I*c) - 5489920*I*a^8*e^(44*I*d*x + 30*
I*c) - 42609280*I*a^8*e^(42*I*d*x + 28*I*c) - 237601280*I*a^8*e^(40*I*d*x +
 26*I*c) - 1013595520*I*a^8*e^(38*I*d*x + 24*I*c) - 3439322880*I*a^8*e^(36*
I*d*x + 22*I*c) - 9529403520*I*a^8*e^(34*I*d*x + 20*I*c) - 21965959680*I*a^
8*e^(32*I*d*x + 18*I*c) - 42709532800*I*a^8*e^(30*I*d*x + 16*I*c) - 7077203
8400*I*a^8*e^(28*I*d*x + 14*I*c) - 100658185600*I*a^8*e^(26*I*d*x + 12*I*c)
 - 123309222400*I*a^8*e^(24*I*d*x + 10*I*c) - 129974633600*I*a^8*e^(22*I*d*
x + 8*I*c) - 117140020480*I*a^8*e^(20*I*d*x + 6*I*c) - 89191105920*I*a^8*e^
(18*I*d*x + 4*I*c) - 56345172480*I*a^8*e^(16*I*d*x + 2*I*c) - 11479265280*I
*a^8*e^(12*I*d*x - 2*I*c) - 3367687680*I*a^8*e^(10*I*d*x - 4*I*c) - 6457651
20*I*a^8*e^(8*I*d*x - 6*I*c) - 52577280*I*a^8*e^(6*I*d*x - 8*I*c) + 7418880
*I*a^8*e^(4*I*d*x - 10*I*c) + 2257920*I*a^8*e^(2*I*d*x - 12*I*c) - 28794769
920*I*a^8*e^(14*I*d*x) + 161280*I*a^8*e^(-14*I*c))/(d*e^(30*I*d*x + 16*I*c)
 + 14*d*e^(28*I*d*x + 14*I*c) + 91*d*e^(26*I*d*x + 12*I*c) + 364*d*e^(24*I*
d*x + 10*I*c) + 1001*d*e^(22*I*d*x + 8*I*c) + 2002*d*e^(20*I*d*x + 6*I*c) +
 3003*d*e^(18*I*d*x + 4*I*c) + 3432*d*e^(16*I*d*x + 2*I*c) + 2002*d*e^(12*I
*d*x - 2*I*c) + 1001*d*e^(10*I*d*x - 4*I*c) + 364*d*e^(8*I*d*x - 6*I*c) + 9
1*d*e^(6*I*d*x - 8*I*c) + 14*d*e^(4*I*d*x - 10*I*c) + d*e^(2*I*d*x - 12*I*c
) + 3003*d*e^(14*I*d*x))
```

maple [B] time = 0.78, size = 789, normalized size = 2.83

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^18*(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/d*(a^8*(-1/18*sin(d*x+c)^7*cos(d*x+c)^11-7/288*sin(d*x+c)^5*cos(d*x+c)^11
-5/576*sin(d*x+c)^3*cos(d*x+c)^11-5/2304*sin(d*x+c)*cos(d*x+c)^11+1/4608*(c
os(d*x+c)^9+9/8*cos(d*x+c)^7+21/16*cos(d*x+c)^5+105/64*cos(d*x+c)^3+315/128
```

```
*cos(d*x+c))*sin(d*x+c)+35/65536*d*x+35/65536*c)-8*I*a^8*(-1/18*sin(d*x+c)^
6*cos(d*x+c)^12-1/48*sin(d*x+c)^4*cos(d*x+c)^12-1/168*sin(d*x+c)^2*cos(d*x+
c)^12-1/1008*cos(d*x+c)^12)-28*a^8*(-1/18*sin(d*x+c)^5*cos(d*x+c)^13-5/288*
sin(d*x+c)^3*cos(d*x+c)^13-5/1344*sin(d*x+c)*cos(d*x+c)^13+5/16128*(cos(d*x
+c)^11+11/10*cos(d*x+c)^9+99/80*cos(d*x+c)^7+231/160*cos(d*x+c)^5+231/128*c
os(d*x+c)^3+693/256*cos(d*x+c))*sin(d*x+c)+55/65536*d*x+55/65536*c)+56*I*a^
8*(-1/18*sin(d*x+c)^4*cos(d*x+c)^14-1/72*sin(d*x+c)^2*cos(d*x+c)^14-1/504*c
os(d*x+c)^14)+70*a^8*(-1/18*sin(d*x+c)^3*cos(d*x+c)^15-1/96*cos(d*x+c)^15*s
in(d*x+c)+1/1344*(cos(d*x+c)^13+13/12*cos(d*x+c)^11+143/120*cos(d*x+c)^9+42
9/320*cos(d*x+c)^7+1001/640*cos(d*x+c)^5+1001/512*cos(d*x+c)^3+3003/1024*co
s(d*x+c))*sin(d*x+c)+143/65536*d*x+143/65536*c)-56*I*a^8*(-1/18*sin(d*x+c)^
2*cos(d*x+c)^16-1/144*cos(d*x+c)^16)-28*a^8*(-1/18*cos(d*x+c)^17*sin(d*x+c)
+1/288*(cos(d*x+c)^15+15/14*cos(d*x+c)^13+65/56*cos(d*x+c)^11+143/112*cos(d
*x+c)^9+1287/896*cos(d*x+c)^7+429/256*cos(d*x+c)^5+2145/1024*cos(d*x+c)^3+6
435/2048*cos(d*x+c))*sin(d*x+c)+715/65536*d*x+715/65536*c)-4/9*I*a^8*cos(d*
x+c)^18+a^8*(1/18*(cos(d*x+c)^17+17/16*cos(d*x+c)^15+255/224*cos(d*x+c)^13+
1105/896*cos(d*x+c)^11+2431/1792*cos(d*x+c)^9+21879/14336*cos(d*x+c)^7+7293
/4096*cos(d*x+c)^5+36465/16384*cos(d*x+c)^3+109395/32768*cos(d*x+c))*sin(d*
x+c)+12155/65536*d*x+12155/65536*c))
```

maxima [A] time = 0.51, size = 269, normalized size = 0.96

$$40320\,(dx+c)a^8 + \frac{40320\,a^8\tan(dx+c)^{17} + 349440\,a^8\tan(dx+c)^{15} + 1338624\,a^8\tan(dx+c)^{13} + 2969856\,a^8\tan(dx+c)^{11} + 4194304\,a^8\tan(dx+c)^9 + 35}{\tan(dx+c)^{18} + 9\tan(dx+c)^{16} + 36\tan(dx+c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^18*(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] 1/4128768*(40320*(d*x + c)*a^8 + (40320*a^8*tan(d*x + c)^17 + 349440*a^8*ta
n(d*x + c)^15 + 1338624*a^8*tan(d*x + c)^13 + 2969856*a^8*tan(d*x + c)^11 +
 4194304*a^8*tan(d*x + c)^9 + 3518208*a^8*tan(d*x + c)^7 + 2752512*I*a^8*ta
n(d*x + c)^6 + 11047680*a^8*tan(d*x + c)^5 - 15335424*I*a^8*tan(d*x + c)^4
- 15488256*a^8*tan(d*x + c)^3 + 10616832*I*a^8*tan(d*x + c)^2 + 4088448*a^8
*tan(d*x + c) - 655360*I*a^8)/(tan(d*x + c)^18 + 9*tan(d*x + c)^16 + 36*tan
(d*x + c)^14 + 84*tan(d*x + c)^12 + 126*tan(d*x + c)^10 + 126*tan(d*x + c)^
8 + 84*tan(d*x + c)^6 + 36*tan(d*x + c)^4 + 9*tan(d*x + c)^2 + 1))/d
```

mupad [B] time = 5.23, size = 231, normalized size = 0.83

$$\frac{5\,a^8\,x}{512} + \frac{\frac{5\,a^8\tan(c+d\,x)^9}{512} + \frac{a^8\tan(c+d\,x)^8\,5\mathrm{i}}{64} - \frac{205\,a^8\tan(c+d\,x)^7}{768} - \frac{a^8\tan(c+d\,x)^6\,95\mathrm{i}}{192} + \frac{a^8\tan(c+d\,x)^5}{2} + \frac{a^8\tan(c+d\,x)^4\,11\mathrm{i}}{64} +}{d\,\left(\tan(c+d\,x)^{10} + \tan(c+d\,x)^9\,8\mathrm{i} - 27\tan(c+d\,x)^8 - \tan(c+d\,x)^7\,48\mathrm{i} + 42\tan(c+d\,x)^6 + 42\tan(c\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^18*(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] (5*a^8*x)/512 + ((a^8*tan(c + d*x)^2*163i)/448 - (a^8*10i)/63 - (9019*a^8*t
an(c + d*x))/32256 + (393*a^8*tan(c + d*x)^3)/1792 + (a^8*tan(c + d*x)^4*11
i)/64 + (a^8*tan(c + d*x)^5)/2 - (a^8*tan(c + d*x)^6*95i)/192 - (205*a^8*ta
n(c + d*x)^7)/768 + (a^8*tan(c + d*x)^8*5i)/64 + (5*a^8*tan(c + d*x)^9)/512
)/(d*(tan(c + d*x)^3*48i - 27*tan(c + d*x)^2 - tan(c + d*x)*8i + 42*tan(c +
 d*x)^4 + 42*tan(c + d*x)^6 - tan(c + d*x)^7*48i - 27*tan(c + d*x)^8 + tan(
c + d*x)^9*8i + tan(c + d*x)^10 + 1))
```

sympy [A] time = 1.80, size = 415, normalized size = 1.49

$$\frac{5a^8x}{512} + \begin{cases} \frac{\left(-2772985687999251815774038261 76ia^8d^9e^{20ic}e^{18idx} - 3119608898999158292745793044480ia^8d^9e^{18ic}e^{16idx} - 16043702909138528362 6926\right.}{} \\ x\left(-\frac{5a^8}{512} + \frac{\left(a^8e^{20ic} + 10a^8e^{18ic} + 45a^8e^{16ic} + 120a^8e^{14ic} + 210a^8e^{12ic} + 252a^8e^{10ic} + 210a^8e^{8ic} + 120a^8e^{6ic} + 45a^8e^{4ic} + 10a^8e^{2ic} + a^8\right)e^{-2ic}}{1024}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**18*(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] 5*a**8*x/512 + Piecewise(((-2772985687999251815774038261176*I*a**8*d**9*exp(
20*I*c)*exp(18*I*d*x) - 31196088989991582927457930444480*I*a**8*d**9*exp(18*
I*c)*exp(16*I*d*x) - 160437029091385283626926499430 40*I*a**8*d**9*exp(16*I*
c)*exp(14*I*d*x) - 49913742383986532683932688711680*I*a**8*d**9*exp(14*I*c)
*exp(12*I*d*x) - 104818859006371718636258646294528*I*a**8*d**9*exp(12*I*c)*
exp(10*I*d*x) - 157228288509555757795438796944 1792*I*a**8*d**9*exp(10*I*c)*e
xp(8*I*d*x) - 174698098343952864393764410490880*I*a**8*d**9*exp(8*I*c)*exp(
6*I*d*x) - 149741227151959598051798066135040*I*a**8*d**9*exp(6*I*c)*exp(4*I
*d*x) - 112305920363969698538848549601280*I*a**8*d**9*exp(4*I*c)*exp(2*I*d*
x) + 24956871191993266341966344355 84*I*a**8*d**9*exp(-2*I*d*x))*exp(-2*I*c)
/(5111167220120220946834707324076032*d**10), Ne(5111167220120220946834707 32
4076032*d**10*exp(2*I*c), 0)), (x*(-5*a**8/512 + (a**8*exp(20*I*c) + 10*a**
8*exp(18*I*c) + 45*a**8*exp(16*I*c) + 120*a**8*exp(14*I*c) + 210*a**8*exp(1
2*I*c) + 252*a**8*exp(10*I*c) + 210*a**8*exp(8*I*c) + 120*a**8*exp(6*I*c) +
 45*a**8*exp(4*I*c) + 10*a**8*exp(2*I*c) + a**8)*exp(-2*I*c)/1024), True))
```

3.91 $\int \cos(c+dx)(a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=235

$$-\frac{3003ia^8\sec(c+dx)}{16d}-\frac{3003a^8\tanh^{-1}(\sin(c+dx))}{16d}-\frac{1001i\sec(c+dx)\left(a^8+ia^8\tan(c+dx)\right)}{16d}-\frac{1001i\sec(c+dx)\left(\right.}{}$$

```
[Out] -3003/16*a^8*arctanh(sin(d*x+c))/d-3003/16*I*a^8*sec(d*x+c)/d-13/6*I*a^3*se
c(d*x+c)*(a+I*a*tan(d*x+c))^5/d-2*I*a*cos(d*x+c)*(a+I*a*tan(d*x+c))^7/d-429
/40*I*a^2*sec(d*x+c)*(a^2+I*a^2*tan(d*x+c))^3/d-143/30*I*sec(d*x+c)*(a^2+I*
a^2*tan(d*x+c))^4/d-1001/40*I*sec(d*x+c)*(a^4+I*a^4*tan(d*x+c))^2/d-1001/16
*I*sec(d*x+c)*(a^8+I*a^8*tan(d*x+c))/d
```

Rubi [A] time = 0.20, antiderivative size = 235, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {3496, 3498, 3486, 3770}

$$-\frac{3003ia^8\sec(c+dx)}{16d}-\frac{3003a^8\tanh^{-1}(\sin(c+dx))}{16d}-\frac{13ia^3\sec(c+dx)(a+ia\tan(c+dx))^5}{6d}-\frac{429ia^2\sec(c+dx)\left(a\right.}{40}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (-3003*a^8*ArcTanh[Sin[c + d*x]])/(16*d) - (((3003*I)/16)*a^8*Sec[c + d*x])
/d - (((13*I)/6)*a^3*Sec[c + d*x]*(a + I*a*Tan[c + d*x])^5)/d - ((2*I)*a*Co
s[c + d*x]*(a + I*a*Tan[c + d*x])^7)/d - (((429*I)/40)*a^2*Sec[c + d*x]*(a^
2 + I*a^2*Tan[c + d*x])^3)/d - (((143*I)/30)*Sec[c + d*x]*(a^2 + I*a^2*Tan[
c + d*x])^4)/d - (((1001*I)/40)*Sec[c + d*x]*(a^4 + I*a^4*Tan[c + d*x])^2)/
d - (((1001*I)/16)*Sec[c + d*x]*(a^8 + I*a^8*Tan[c + d*x]))/d
```

Rule 3486

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

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3498

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \cos(c+dx)(a+ia\tan(c+dx))^8\,dx = -\frac{2ia\cos(c+dx)(a+ia\tan(c+dx))^7}{d} - \left(13a^2\right)\int \sec(c+dx)(a+ia\,\mathrm{t}$$
$$= -\frac{13ia^3\sec(c+dx)(a+ia\tan(c+dx))^5}{6d} - \frac{2ia\cos(c+dx)(a+ia\tan(}{d}$$
$$= -\frac{13ia^3\sec(c+dx)(a+ia\tan(c+dx))^5}{6d} - \frac{2ia\cos(c+dx)(a+ia\tan(}{d}$$
$$= -\frac{429ia^5\sec(c+dx)(a+ia\tan(c+dx))^3}{40d} - \frac{13ia^3\sec(c+dx)(a+ia\,\mathrm{ta}}{6d}$$
$$= -\frac{429ia^5\sec(c+dx)(a+ia\tan(c+dx))^3}{40d} - \frac{13ia^3\sec(c+dx)(a+ia\,\mathrm{ta}}{6d}$$
$$= -\frac{429ia^5\sec(c+dx)(a+ia\tan(c+dx))^3}{40d} - \frac{13ia^3\sec(c+dx)(a+ia\,\mathrm{ta}}{6d}$$
$$= -\frac{3003ia^8\sec(c+dx)}{16d} - \frac{429ia^5\sec(c+dx)(a+ia\tan(c+dx))^3}{40d} - \frac{13i}{}$$
$$= -\frac{3003a^8\tanh^{-1}(\sin(c+dx))}{16d} - \frac{3003ia^8\sec(c+dx)}{16d} - \frac{429ia^5\sec(c+}{}$$

Mathematica [A] time = 3.38, size = 205, normalized size = 0.87

$$\frac{a^8(\cos(8c)-i\sin(8c))\cos^2(c+dx)(\tan(c+dx)-i)^8\left(-658944i\cos(c+dx)+5(12870\sin(c+dx)+22165\,\mathrm{si}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (a^8*Cos[c + d*x]^2*(Cos[8*c] - I*Sin[8*c])*((-658944*I)*Cos[c + d*x] + 720
720*Cos[c + d*x]^6*(Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - Log[Cos[(c +
 d*x)/2] + Sin[(c + d*x)/2]]) + 5*((-73216*I)*Cos[3*(c + d*x)] - (19968*I)*
Cos[5*(c + d*x)] - (1536*I)*Cos[7*(c + d*x)] + 12870*Sin[c + d*x] + 22165*S
in[3*(c + d*x)] + 10959*Sin[5*(c + d*x)] + 1536*Sin[7*(c + d*x)]))*(-I + Ta
n[c + d*x])^8)/(3840*d*(Cos[d*x] + I*Sin[d*x])^8)
```

fricas [A] time = 0.68, size = 378, normalized size = 1.61

$$\frac{-30720i\,a^8e^{(13i\,dx+13i\,c)} - 309270i\,a^8e^{(11i\,dx+11i\,c)} - 953810i\,a^8e^{(9i\,dx+9i\,c)} - 1446588i\,a^8e^{(7i\,dx+7i\,c)} - 1189188i\,a^8e^{(}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/240*(-30720*I*a^8*e^(13*I*d*x + 13*I*c) - 309270*I*a^8*e^(11*I*d*x + 11*I
*c) - 953810*I*a^8*e^(9*I*d*x + 9*I*c) - 1446588*I*a^8*e^(7*I*d*x + 7*I*c)
- 1189188*I*a^8*e^(5*I*d*x + 5*I*c) - 510510*I*a^8*e^(3*I*d*x + 3*I*c) - 90
090*I*a^8*e^(I*d*x + I*c) - 45045*(a^8*e^(12*I*d*x + 12*I*c) + 6*a^8*e^(10*
I*d*x + 10*I*c) + 15*a^8*e^(8*I*d*x + 8*I*c) + 20*a^8*e^(6*I*d*x + 6*I*c) +
```

```
15*a^8*e^(4*I*d*x + 4*I*c) + 6*a^8*e^(2*I*d*x + 2*I*c) + a^8)*log(e^(I*d*x
 + I*c) + I) + 45045*(a^8*e^(12*I*d*x + 12*I*c) + 6*a^8*e^(10*I*d*x + 10*I*
c) + 15*a^8*e^(8*I*d*x + 8*I*c) + 20*a^8*e^(6*I*d*x + 6*I*c) + 15*a^8*e^(4*
I*d*x + 4*I*c) + 6*a^8*e^(2*I*d*x + 2*I*c) + a^8)*log(e^(I*d*x + I*c) - I))
/(d*e^(12*I*d*x + 12*I*c) + 6*d*e^(10*I*d*x + 10*I*c) + 15*d*e^(8*I*d*x + 8
*I*c) + 20*d*e^(6*I*d*x + 6*I*c) + 15*d*e^(4*I*d*x + 4*I*c) + 6*d*e^(2*I*d*
x + 2*I*c) + d)
```

giac [B] time = 5.36, size = 924, normalized size = 3.93

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/61440*(11512215*a^8*e^(12*I*d*x + 12*I*c)*log(I*e^(I*d*x + I*c) + 1) + 69
073290*a^8*e^(10*I*d*x + 10*I*c)*log(I*e^(I*d*x + I*c) + 1) + 172683225*a^8
*e^(8*I*d*x + 8*I*c)*log(I*e^(I*d*x + I*c) + 1) + 230244300*a^8*e^(6*I*d*x
+ 6*I*c)*log(I*e^(I*d*x + I*c) + 1) + 172683225*a^8*e^(4*I*d*x + 4*I*c)*log
(I*e^(I*d*x + I*c) + 1) + 69073290*a^8*e^(2*I*d*x + 2*I*c)*log(I*e^(I*d*x +
 I*c) + 1) - 19305*a^8*e^(12*I*d*x + 12*I*c)*log(I*e^(I*d*x + I*c) - 1) - 1
15830*a^8*e^(10*I*d*x + 10*I*c)*log(I*e^(I*d*x + I*c) - 1) - 289575*a^8*e^(
8*I*d*x + 8*I*c)*log(I*e^(I*d*x + I*c) - 1) - 386100*a^8*e^(6*I*d*x + 6*I*c
)*log(I*e^(I*d*x + I*c) - 1) - 289575*a^8*e^(4*I*d*x + 4*I*c)*log(I*e^(I*d*
x + I*c) - 1) - 115830*a^8*e^(2*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) - 1) -
 11512215*a^8*e^(12*I*d*x + 12*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 69073290*
a^8*e^(10*I*d*x + 10*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 172683225*a^8*e^(8*
I*d*x + 8*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 230244300*a^8*e^(6*I*d*x + 6*I
*c)*log(-I*e^(I*d*x + I*c) + 1) - 172683225*a^8*e^(4*I*d*x + 4*I*c)*log(-I*
e^(I*d*x + I*c) + 1) - 69073290*a^8*e^(2*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I
*c) + 1) + 19305*a^8*e^(12*I*d*x + 12*I*c)*log(-I*e^(I*d*x + I*c) - 1) + 11
5830*a^8*e^(10*I*d*x + 10*I*c)*log(-I*e^(I*d*x + I*c) - 1) + 289575*a^8*e^(
8*I*d*x + 8*I*c)*log(-I*e^(I*d*x + I*c) - 1) + 386100*a^8*e^(6*I*d*x + 6*I*
c)*log(-I*e^(I*d*x + I*c) - 1) + 289575*a^8*e^(4*I*d*x + 4*I*c)*log(-I*e^(I
*d*x + I*c) - 1) + 115830*a^8*e^(2*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) -
1) - 7864320*I*a^8*e^(13*I*d*x + 13*I*c) - 79173120*I*a^8*e^(11*I*d*x + 11*
I*c) - 244175360*I*a^8*e^(9*I*d*x + 9*I*c) - 370326528*I*a^8*e^(7*I*d*x + 7
*I*c) - 304432128*I*a^8*e^(5*I*d*x + 5*I*c) - 130690560*I*a^8*e^(3*I*d*x +
3*I*c) - 23063040*I*a^8*e^(I*d*x + I*c) + 11512215*a^8*log(I*e^(I*d*x + I*c
) + 1) - 19305*a^8*log(I*e^(I*d*x + I*c) - 1) - 11512215*a^8*log(-I*e^(I*d*
x + I*c) + 1) + 19305*a^8*log(-I*e^(I*d*x + I*c) - 1))/(d*e^(12*I*d*x + 12*
I*c) + 6*d*e^(10*I*d*x + 10*I*c) + 15*d*e^(8*I*d*x + 8*I*c) + 20*d*e^(6*I*d
*x + 6*I*c) + 15*d*e^(4*I*d*x + 4*I*c) + 6*d*e^(2*I*d*x + 2*I*c) + d)
```

maple [B] time = 0.54, size = 464, normalized size = 1.97

$$-\frac{7a^8\left(\sin^7(dx+c)\right)}{d\cos(dx+c)^4}+\frac{21a^8\left(\sin^7(dx+c)\right)}{2d\cos(dx+c)^2}+\frac{a^8\left(\sin^9(dx+c)\right)}{6d\cos(dx+c)^6}-\frac{a^8\left(\sin^9(dx+c)\right)}{8d\cos(dx+c)^4}+\frac{5a^8\left(\sin^9(dx+c)\right)}{16d\cos(dx+c)^2}-\frac{8ia^8\left(\sin^8\right.}{d\cos(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)*(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] -7/d*a^8*sin(d*x+c)^7/cos(d*x+c)^4+21/2/d*a^8*sin(d*x+c)^7/cos(d*x+c)^2+1/6
/d*a^8*sin(d*x+c)^9/cos(d*x+c)^6-1/8/d*a^8*sin(d*x+c)^9/cos(d*x+c)^4+5/16/d
*a^8*sin(d*x+c)^9/cos(d*x+c)^2-8*I/d*a^8*sin(d*x+c)^8/cos(d*x+c)-328/5*I/d*
a^8*cos(d*x+c)*sin(d*x+c)^4-8/5*I/d*a^8*sin(d*x+c)^8/cos(d*x+c)^5-56*I/d*a^
8*sin(d*x+c)^6/cos(d*x+c)-2152/15*I/d*a^8*cos(d*x+c)*sin(d*x+c)^2+8/5*I/d*a
^8*sin(d*x+c)^8/cos(d*x+c)^3+56/3*I/d*a^8*sin(d*x+c)^6/cos(d*x+c)^3-56*I/d*
a^8*sin(d*x+c)^4/cos(d*x+c)-8*I/d*a^8*cos(d*x+c)*sin(d*x+c)^6-4424/15*I/d*a
```

```
^8*cos(d*x+c)+5/16*a^8*sin(d*x+c)^7/d+175/16*a^8*sin(d*x+c)^5/d+2555/48*a^8
*sin(d*x+c)^3/d-3003/16/d*a^8*ln(sec(d*x+c)+tan(d*x+c))+35/d*a^8*sin(d*x+c)
^5/cos(d*x+c)^2+3019/16*a^8*sin(d*x+c)/d
```

maxima [B] time = 0.49, size = 396, normalized size = 1.69

$$-\frac{5\,a^8\left(\frac{2\left(87\,\sin(dx+c)^5-136\,\sin(dx+c)^3+57\,\sin(dx+c)\right)}{\sin(dx+c)^6-3\,\sin(dx+c)^4+3\,\sin(dx+c)^2-1}+105\,\log\left(\sin\left(dx+c\right)+1\right)-105\,\log\left(\sin\left(dx+c\right)-1\right)-96\,\sin\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] -1/480*(5*a^8*(2*(87*sin(d*x + c)^5 - 136*sin(d*x + c)^3 + 57*sin(d*x + c))
/(sin(d*x + c)^6 - 3*sin(d*x + c)^4 + 3*sin(d*x + c)^2 - 1) + 105*log(sin(d
*x + c) + 1) - 105*log(sin(d*x + c) - 1) - 96*sin(d*x + c)) + 840*a^8*(2*(9
*sin(d*x + c)^3 - 7*sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(d*x + c)^2 + 1) +
 15*log(sin(d*x + c) + 1) - 15*log(sin(d*x + c) - 1) - 16*sin(d*x + c)) + 8
400*a^8*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) + 3*log(sin(d*x + c) + 1) - 3*
log(sin(d*x + c) - 1) - 4*sin(d*x + c)) + 26880*I*a^8*(1/cos(d*x + c) + cos
(d*x + c)) + 8960*I*a^8*((6*cos(d*x + c)^2 - 1)/cos(d*x + c)^3 + 3*cos(d*x
+ c)) + 768*I*a^8*((15*cos(d*x + c)^4 - 5*cos(d*x + c)^2 + 1)/cos(d*x + c)^
5 + 5*cos(d*x + c)) + 6720*a^8*(log(sin(d*x + c) + 1) - log(sin(d*x + c) -
1) - 2*sin(d*x + c)) + 3840*I*a^8*cos(d*x + c) - 480*a^8*sin(d*x + c))/d
```

mupad [B] time = 8.30, size = 399, normalized size = 1.70

$$\frac{\frac{3019\,a^8\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{12}}{8}+\frac{a^8\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{11}\,2891\mathrm{i}}{8}-\frac{52795\,a^8\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}}{24}-\frac{a^8\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{9}\,45115\mathrm{i}}{24}+\frac{22415\,a^8\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{8}}{4}+\frac{a^8\,\tan\left(\frac{c}{2}\right.}{}}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{13}+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{12}\,1\mathrm{i}-6\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{11}-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}\,6\mathrm{i}+15\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{9}+\tan\left(\frac{c}{2}+\frac{d}{2}\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] ((a^8*tan(c/2 + (d*x)/2)^3*160729i)/120 - (127113*a^8*tan(c/2 + (d*x)/2)^2)
/40 + (167237*a^8*tan(c/2 + (d*x)/2)^4)/24 - (a^8*tan(c/2 + (d*x)/2)^5*1297
7i)/4 - (97811*a^8*tan(c/2 + (d*x)/2)^6)/12 + (a^8*tan(c/2 + (d*x)/2)^7*437
57i)/12 + (22415*a^8*tan(c/2 + (d*x)/2)^8)/4 - (a^8*tan(c/2 + (d*x)/2)^9*45
115i)/24 - (52795*a^8*tan(c/2 + (d*x)/2)^10)/24 + (a^8*tan(c/2 + (d*x)/2)^1
1*2891i)/8 + (3019*a^8*tan(c/2 + (d*x)/2)^12)/8 + (8848*a^8)/15 - (a^8*tan(
c/2 + (d*x)/2)*25499i)/120)/(d*(tan(c/2 + (d*x)/2) - tan(c/2 + (d*x)/2)^2*6
i - 6*tan(c/2 + (d*x)/2)^3 + tan(c/2 + (d*x)/2)^4*15i + 15*tan(c/2 + (d*x)/
2)^5 - tan(c/2 + (d*x)/2)^6*20i - 20*tan(c/2 + (d*x)/2)^7 + tan(c/2 + (d*x)
/2)^8*15i + 15*tan(c/2 + (d*x)/2)^9 - tan(c/2 + (d*x)/2)^10*6i - 6*tan(c/2
+ (d*x)/2)^11 + tan(c/2 + (d*x)/2)^12*1i + tan(c/2 + (d*x)/2)^13 + 1i)) - (
3003*a^8*atanh(tan(c/2 + (d*x)/2)))/(8*d)
```

sympy [A] time = 0.94, size = 320, normalized size = 1.36

$$\frac{3003a^8\left(\frac{\log\left(e^{idx}-ie^{-ic}\right)}{16}-\frac{\log\left(e^{idx}+ie^{-ic}\right)}{16}\right)}{d}+\frac{62475ia^8e^{11ic}e^{11idx}+246505ia^8e^{9ic}e^{9idx}+416094ia^8e^{7ic}e^{7idx}+364194ia}{-120de^{12ic}e^{12idx}-720de^{10ic}e^{10idx}-1800de^{8ic}e^{8idx}-2400de^{6ic}e^{6id}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] 3003*a**8*(log(exp(I*d*x) - I*exp(-I*c))/16 - log(exp(I*d*x) + I*exp(-I*c))
/16)/d + (62475*I*a**8*exp(11*I*c)*exp(11*I*d*x) + 246505*I*a**8*exp(9*I*c)
*exp(9*I*d*x) + 416094*I*a**8*exp(7*I*c)*exp(7*I*d*x) + 364194*I*a**8*exp(5
*I*c)*exp(5*I*d*x) + 163095*I*a**8*exp(3*I*c)*exp(3*I*d*x) + 29685*I*a**8*e
xp(I*c)*exp(I*d*x))/(-120*d*exp(12*I*c)*exp(12*I*d*x) - 720*d*exp(10*I*c)*e
xp(10*I*d*x) - 1800*d*exp(8*I*c)*exp(8*I*d*x) - 2400*d*exp(6*I*c)*exp(6*I*d
*x) - 1800*d*exp(4*I*c)*exp(4*I*d*x) - 720*d*exp(2*I*c)*exp(2*I*d*x) - 120*
d) + Piecewise((-128*I*a**8*exp(I*c)*exp(I*d*x)/d, Ne(d, 0)), (128*a**8*x*e
xp(I*c), True))
```

3.92 $\int \cos^3(c+dx)(a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=205

$$\frac{1155ia^8\sec(c+dx)}{8d}+\frac{1155a^8\tanh^{-1}(\sin(c+dx))}{8d}+\frac{385i\sec(c+dx)\left(a^8+ia^8\tan(c+dx)\right)}{8d}+\frac{77i\sec(c+dx)\left(a^4\right.}{4}$$

```
[Out] 1155/8*a^8*arctanh(sin(d*x+c))/d+1155/8*I*a^8*sec(d*x+c)/d+22/3*I*a^3*cos(d
*x+c)*(a+I*a*tan(d*x+c))^5/d-2/3*I*a*cos(d*x+c)^3*(a+I*a*tan(d*x+c))^7/d+33
/4*I*a^2*sec(d*x+c)*(a^2+I*a^2*tan(d*x+c))^3/d+77/4*I*sec(d*x+c)*(a^4+I*a^4
*tan(d*x+c))^2/d+385/8*I*sec(d*x+c)*(a^8+I*a^8*tan(d*x+c))/d
```

Rubi [A] time = 0.19, antiderivative size = 205, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {3496, 3498, 3486, 3770}

$$\frac{1155ia^8\sec(c+dx)}{8d}+\frac{1155a^8\tanh^{-1}(\sin(c+dx))}{8d}+\frac{22ia^3\cos(c+dx)(a+ia\tan(c+dx))^5}{3d}+\frac{33ia^2\sec(c+dx)\left(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (1155*a^8*ArcTanh[Sin[c + d*x]])/(8*d) + (((1155*I)/8)*a^8*Sec[c + d*x])/d
+ (((22*I)/3)*a^3*Cos[c + d*x]*(a + I*a*Tan[c + d*x])^5)/d - (((2*I)/3)*a*C
os[c + d*x]^3*(a + I*a*Tan[c + d*x])^7)/d + (((33*I)/4)*a^2*Sec[c + d*x]*(a
^2 + I*a^2*Tan[c + d*x])^3)/d + (((77*I)/4)*Sec[c + d*x]*(a^4 + I*a^4*Tan[c
 + d*x])^2)/d + (((385*I)/8)*Sec[c + d*x]*(a^8 + I*a^8*Tan[c + d*x]))/d
```

Rule 3486

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

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3498

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \cos^3(c+dx)(a+ia\tan(c+dx))^8\,dx = -\frac{2ia\cos^3(c+dx)(a+ia\tan(c+dx))^7}{3d} - \frac{1}{3}\left(11a^2\right)\int \cos(c+dx)(a+ia$$
$$= \frac{22ia^3\cos(c+dx)(a+ia\tan(c+dx))^5}{3d} - \frac{2ia\cos^3(c+dx)(a+ia\tan(c+$$
$$= \frac{33ia^5\sec(c+dx)(a+ia\tan(c+dx))^3}{4d} + \frac{22ia^3\cos(c+dx)(a+ia\tan($$
$$= \frac{33ia^5\sec(c+dx)(a+ia\tan(c+dx))^3}{4d} + \frac{22ia^3\cos(c+dx)(a+ia\tan(c$$
$$= \frac{33ia^5\sec(c+dx)(a+ia\tan(c+dx))^3}{4d} + \frac{22ia^3\cos(c+dx)(a+ia\tan(c$$
$$= \frac{1155ia^8\sec(c+dx)}{8d} + \frac{33ia^5\sec(c+dx)(a+ia\tan(c+dx))^3}{4d} + \frac{22ia^3\text{c}$$
$$= \frac{1155a^8\tanh^{-1}(\sin(c+dx))}{8d} + \frac{1155ia^8\sec(c+dx)}{8d} + \frac{33ia^5\sec(c+dx)($$

Mathematica [B] time = 7.45, size = 1540, normalized size = 7.51

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (-1155*Cos[8*c]*Cos[c + d*x]^8*Log[Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2]]
*(a + I*a*Tan[c + d*x])^8)/(8*d*(Cos[d*x] + I*Sin[d*x])^8) + (1155*Cos[8*c]
*Cos[c + d*x]^8*Log[Cos[c/2 + (d*x)/2] + Sin[c/2 + (d*x)/2]]*(a + I*a*Tan[c
 + d*x])^8)/(8*d*(Cos[d*x] + I*Sin[d*x])^8) + (Cos[3*d*x]*Cos[c + d*x]^8*((
(-32*I)/3)*Cos[5*c] - (32*Sin[5*c])/3)*(a + I*a*Tan[c + d*x])^8)/(d*(Cos[d*
x] + I*Sin[d*x])^8) + (Cos[d*x]*Cos[c + d*x]^8*((160*I)*Cos[7*c] + 160*Sin[
7*c])*(a + I*a*Tan[c + d*x])^8)/(d*(Cos[d*x] + I*Sin[d*x])^8) + (((1155*I)/
8)*Cos[c + d*x]^8*Log[Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2]]*Sin[8*c]*(a
+ I*a*Tan[c + d*x])^8)/(d*(Cos[d*x] + I*Sin[d*x])^8) - (((1155*I)/8)*Cos[c
+ d*x]^8*Log[Cos[c/2 + (d*x)/2] + Sin[c/2 + (d*x)/2]]*Sin[8*c]*(a + I*a*Tan
[c + d*x])^8)/(d*(Cos[d*x] + I*Sin[d*x])^8) + (Cos[c + d*x]^8*Sec[c]*(((236
*I)/3)*Cos[8*c] + (236*Sin[8*c])/3)*(a + I*a*Tan[c + d*x])^8)/(d*(Cos[d*x]
+ I*Sin[d*x])^8) + (Cos[c + d*x]^8*(-160*Cos[7*c] + (160*I)*Sin[7*c])*Sin[d
*x]*(a + I*a*Tan[c + d*x])^8)/(d*(Cos[d*x] + I*Sin[d*x])^8) + (Cos[c + d*x]
^8*((32*Cos[5*c])/3 - ((32*I)/3)*Sin[5*c])*Sin[3*d*x]*(a + I*a*Tan[c + d*x]
)^8)/(d*(Cos[d*x] + I*Sin[d*x])^8) + (Cos[c + d*x]^8*(Cos[8*c]/16 - (I/16)*
Sin[8*c])*(a + I*a*Tan[c + d*x])^8)/(d*(Cos[d*x] + I*Sin[d*x])^8*(Cos[c/2 +
 (d*x)/2] - Sin[c/2 + (d*x)/2])^4) - (I*Cos[c + d*x]^8*((4*Cos[8*c])/3 - ((
4*I)/3)*Sin[8*c])*Sin[(d*x)/2]*(a + I*a*Tan[c + d*x])^8)/(d*(Cos[c/2] - Sin
[c/2])*(Cos[d*x] + I*Sin[d*x])^8*(Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2])^
3) + (Cos[c + d*x]^8*((-375 - 32*I)*Cos[c/2] + (375 - 32*I)*Sin[c/2])*(Cos[
8*c]/48 - (I/48)*Sin[8*c])*(a + I*a*Tan[c + d*x])^8)/(d*(Cos[c/2] - Sin[c/2
])*(Cos[d*x] + I*Sin[d*x])^8*(Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2])^2) +
 (I*Cos[c + d*x]^8*((236*Cos[8*c])/3 - ((236*I)/3)*Sin[8*c])*Sin[(d*x)/2]*(
a + I*a*Tan[c + d*x])^8)/(d*(Cos[c/2] - Sin[c/2])*(Cos[d*x] + I*Sin[d*x])^8
*(Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2])) + (Cos[c + d*x]^8*(-1/16*Cos[8*
c] + (I/16)*Sin[8*c])*(a + I*a*Tan[c + d*x])^8)/(d*(Cos[d*x] + I*Sin[d*x])^
8*(Cos[c/2 + (d*x)/2] + Sin[c/2 + (d*x)/2])^4) + (I*Cos[c + d*x]^8*((4*Cos[
8*c])/3 - ((4*I)/3)*Sin[8*c])*Sin[(d*x)/2]*(a + I*a*Tan[c + d*x])^8)/(d*(Co
s[c/2] + Sin[c/2])*(Cos[d*x] + I*Sin[d*x])^8*(Cos[c/2 + (d*x)/2] + Sin[c/2
```

```
+ (d*x)/2])^3) + (Cos[c + d*x]^8*((375 - 32*I)*Cos[c/2] + (375 + 32*I)*Sin[
c/2])*(Cos[8*c]/48 - (I/48)*Sin[8*c])*(a + I*a*Tan[c + d*x])^8)/(d*(Cos[c/2
] + Sin[c/2])*(Cos[d*x] + I*Sin[d*x])^8*(Cos[c/2 + (d*x)/2] + Sin[c/2 + (d*
x)/2])^2) - (I*Cos[c + d*x]^8*((236*Cos[8*c])/3 - ((236*I)/3)*Sin[8*c])*Sin
[(d*x)/2]*(a + I*a*Tan[c + d*x])^8)/(d*(Cos[c/2] + Sin[c/2])*(Cos[d*x] + I*
Sin[d*x])^8*(Cos[c/2 + (d*x)/2] + Sin[c/2 + (d*x)/2]))
```

fricas [A] time = 0.68, size = 284, normalized size = 1.39

$$\frac{-256i\,a^8e^{(11i\,dx+11i\,c)} + 2816i\,a^8e^{(9i\,dx+9i\,c)} + 18414i\,a^8e^{(7i\,dx+7i\,c)} + 33726i\,a^8e^{(5i\,dx+5i\,c)} + 25410i\,a^8e^{(3i\,dx+3i\,c)} + 6}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/24*(-256*I*a^8*e^(11*I*d*x + 11*I*c) + 2816*I*a^8*e^(9*I*d*x + 9*I*c) + 1
8414*I*a^8*e^(7*I*d*x + 7*I*c) + 33726*I*a^8*e^(5*I*d*x + 5*I*c) + 25410*I*
a^8*e^(3*I*d*x + 3*I*c) + 6930*I*a^8*e^(I*d*x + I*c) + 3465*(a^8*e^(8*I*d*x
 + 8*I*c) + 4*a^8*e^(6*I*d*x + 6*I*c) + 6*a^8*e^(4*I*d*x + 4*I*c) + 4*a^8*e
^(2*I*d*x + 2*I*c) + a^8)*log(e^(I*d*x + I*c) + I) - 3465*(a^8*e^(8*I*d*x +
 8*I*c) + 4*a^8*e^(6*I*d*x + 6*I*c) + 6*a^8*e^(4*I*d*x + 4*I*c) + 4*a^8*e^(
2*I*d*x + 2*I*c) + a^8)*log(e^(I*d*x + I*c) - I))/(d*e^(8*I*d*x + 8*I*c) +
4*d*e^(6*I*d*x + 6*I*c) + 6*d*e^(4*I*d*x + 4*I*c) + 4*d*e^(2*I*d*x + 2*I*c)
 + d)
```

giac [B] time = 7.40, size = 2835, normalized size = 13.83

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/3440640*(26725545*a^8*e^(28*I*d*x + 14*I*c)*log(I*e^(I*d*x + I*c) + 1) +
374157630*a^8*e^(26*I*d*x + 12*I*c)*log(I*e^(I*d*x + I*c) + 1) + 2432024595
*a^8*e^(24*I*d*x + 10*I*c)*log(I*e^(I*d*x + I*c) + 1) + 9728098380*a^8*e^(2
2*I*d*x + 8*I*c)*log(I*e^(I*d*x + I*c) + 1) + 26752270545*a^8*e^(20*I*d*x +
 6*I*c)*log(I*e^(I*d*x + I*c) + 1) + 53504541090*a^8*e^(18*I*d*x + 4*I*c)*l
og(I*e^(I*d*x + I*c) + 1) + 80256811635*a^8*e^(16*I*d*x + 2*I*c)*log(I*e^(I
*d*x + I*c) + 1) + 80256811635*a^8*e^(12*I*d*x - 2*I*c)*log(I*e^(I*d*x + I*
c) + 1) + 53504541090*a^8*e^(10*I*d*x - 4*I*c)*log(I*e^(I*d*x + I*c) + 1) +
 26752270545*a^8*e^(8*I*d*x - 6*I*c)*log(I*e^(I*d*x + I*c) + 1) + 972809838
0*a^8*e^(6*I*d*x - 8*I*c)*log(I*e^(I*d*x + I*c) + 1) + 2432024595*a^8*e^(4*
I*d*x - 10*I*c)*log(I*e^(I*d*x + I*c) + 1) + 374157630*a^8*e^(2*I*d*x - 12*
I*c)*log(I*e^(I*d*x + I*c) + 1) + 91722070440*a^8*e^(14*I*d*x)*log(I*e^(I*d
*x + I*c) + 1) + 26725545*a^8*e^(-14*I*c)*log(I*e^(I*d*x + I*c) + 1) + 5234
64480*a^8*e^(28*I*d*x + 14*I*c)*log(I*e^(I*d*x + I*c) - 1) + 7328502720*a^8
*e^(26*I*d*x + 12*I*c)*log(I*e^(I*d*x + I*c) - 1) + 47635267680*a^8*e^(24*I
*d*x + 10*I*c)*log(I*e^(I*d*x + I*c) - 1) + 190541070720*a^8*e^(22*I*d*x +
8*I*c)*log(I*e^(I*d*x + I*c) - 1) + 523987944480*a^8*e^(20*I*d*x + 6*I*c)*l
og(I*e^(I*d*x + I*c) - 1) + 1047975888960*a^8*e^(18*I*d*x + 4*I*c)*log(I*e^
(I*d*x + I*c) - 1) + 1571963833440*a^8*e^(16*I*d*x + 2*I*c)*log(I*e^(I*d*x
+ I*c) - 1) + 1571963833440*a^8*e^(12*I*d*x - 2*I*c)*log(I*e^(I*d*x + I*c)
- 1) + 1047975888960*a^8*e^(10*I*d*x - 4*I*c)*log(I*e^(I*d*x + I*c) - 1) +
523987944480*a^8*e^(8*I*d*x - 6*I*c)*log(I*e^(I*d*x + I*c) - 1) + 190541070
720*a^8*e^(6*I*d*x - 8*I*c)*log(I*e^(I*d*x + I*c) - 1) + 47635267680*a^8*e^
(4*I*d*x - 10*I*c)*log(I*e^(I*d*x + I*c) - 1) + 7328502720*a^8*e^(2*I*d*x -
 12*I*c)*log(I*e^(I*d*x + I*c) - 1) + 1796530095360*a^8*e^(14*I*d*x)*log(I*
e^(I*d*x + I*c) - 1) + 523464480*a^8*e^(-14*I*c)*log(I*e^(I*d*x + I*c) - 1)
 - 26725545*a^8*e^(28*I*d*x + 14*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 3741576
```

30*a^8*e^(26*I*d*x + 12*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 2432024595*a^8*e
^(24*I*d*x + 10*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 9728098380*a^8*e^(22*I*d
*x + 8*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 26752270545*a^8*e^(20*I*d*x + 6*I
*c)*log(-I*e^(I*d*x + I*c) + 1) - 53504541090*a^8*e^(18*I*d*x + 4*I*c)*log(
-I*e^(I*d*x + I*c) + 1) - 80256811635*a^8*e^(16*I*d*x + 2*I*c)*log(-I*e^(I*
d*x + I*c) + 1) - 80256811635*a^8*e^(12*I*d*x - 2*I*c)*log(-I*e^(I*d*x + I*
c) + 1) - 53504541090*a^8*e^(10*I*d*x - 4*I*c)*log(-I*e^(I*d*x + I*c) + 1)
- 26752270545*a^8*e^(8*I*d*x - 6*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 9728098
380*a^8*e^(6*I*d*x - 8*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 2432024595*a^8*e^
(4*I*d*x - 10*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 374157630*a^8*e^(2*I*d*x -
12*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 91722070440*a^8*e^(14*I*d*x)*log(-I*
e^(I*d*x + I*c) + 1) - 26725545*a^8*e^(-14*I*c)*log(-I*e^(I*d*x + I*c) + 1)
- 523464480*a^8*e^(28*I*d*x + 14*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 732850
2720*a^8*e^(26*I*d*x + 12*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 47635267680*a^
8*e^(24*I*d*x + 10*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 190541070720*a^8*e^(2
2*I*d*x + 8*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 523987944480*a^8*e^(20*I*d*x
+ 6*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 1047975888960*a^8*e^(18*I*d*x + 4*I
*c)*log(-I*e^(I*d*x + I*c) - 1) - 1571963833440*a^8*e^(16*I*d*x + 2*I*c)*lo
g(-I*e^(I*d*x + I*c) - 1) - 1571963833440*a^8*e^(12*I*d*x - 2*I*c)*log(-I*e
^(I*d*x + I*c) - 1) - 1047975888960*a^8*e^(10*I*d*x - 4*I*c)*log(-I*e^(I*d*
x + I*c) - 1) - 523987944480*a^8*e^(8*I*d*x - 6*I*c)*log(-I*e^(I*d*x + I*c)
- 1) - 190541070720*a^8*e^(6*I*d*x - 8*I*c)*log(-I*e^(I*d*x + I*c) - 1) -
47635267680*a^8*e^(4*I*d*x - 10*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 73285027
20*a^8*e^(2*I*d*x - 12*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 1796530095360*a^8
*e^(14*I*d*x)*log(-I*e^(I*d*x + I*c) - 1) - 523464480*a^8*e^(-14*I*c)*log(-
I*e^(I*d*x + I*c) - 1) - 3465*a^8*e^(28*I*d*x + 14*I*c)*log(I*e^(I*d*x) + e
^(-I*c)) - 48510*a^8*e^(26*I*d*x + 12*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 31
5315*a^8*e^(24*I*d*x + 10*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 1261260*a^8*e^
(22*I*d*x + 8*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 3468465*a^8*e^(20*I*d*x +
6*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 6936930*a^8*e^(18*I*d*x + 4*I*c)*log(I
*e^(I*d*x) + e^(-I*c)) - 10405395*a^8*e^(16*I*d*x + 2*I*c)*log(I*e^(I*d*x)
+ e^(-I*c)) - 10405395*a^8*e^(12*I*d*x - 2*I*c)*log(I*e^(I*d*x) + e^(-I*c))
- 6936930*a^8*e^(10*I*d*x - 4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 3468465*a
^8*e^(8*I*d*x - 6*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 1261260*a^8*e^(6*I*d*x
- 8*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 315315*a^8*e^(4*I*d*x - 10*I*c)*log
(I*e^(I*d*x) + e^(-I*c)) - 48510*a^8*e^(2*I*d*x - 12*I*c)*log(I*e^(I*d*x) +
e^(-I*c)) - 11891880*a^8*e^(14*I*d*x)*log(I*e^(I*d*x) + e^(-I*c)) - 3465*a
^8*e^(-14*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 3465*a^8*e^(28*I*d*x + 14*I*c)
*log(-I*e^(I*d*x) + e^(-I*c)) + 48510*a^8*e^(26*I*d*x + 12*I*c)*log(-I*e^(I
*d*x) + e^(-I*c)) + 315315*a^8*e^(24*I*d*x + 10*I*c)*log(-I*e^(I*d*x) + e^(
-I*c)) + 1261260*a^8*e^(22*I*d*x + 8*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 34
68465*a^8*e^(20*I*d*x + 6*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 6936930*a^8*e
^(18*I*d*x + 4*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 10405395*a^8*e^(16*I*d*x
+ 2*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 10405395*a^8*e^(12*I*d*x - 2*I*c)*
log(-I*e^(I*d*x) + e^(-I*c)) + 6936930*a^8*e^(10*I*d*x - 4*I*c)*log(-I*e^(I
*d*x) + e^(-I*c)) + 3468465*a^8*e^(8*I*d*x - 6*I*c)*log(-I*e^(I*d*x) + e^(-
I*c)) + 1261260*a^8*e^(6*I*d*x - 8*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 3153
15*a^8*e^(4*I*d*x - 10*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 48510*a^8*e^(2*I
*d*x - 12*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 11891880*a^8*e^(14*I*d*x)*log
(-I*e^(I*d*x) + e^(-I*c)) + 3465*a^8*e^(-14*I*c)*log(-I*e^(I*d*x) + e^(-I*c
)) - 36700160*I*a^8*e^(31*I*d*x + 17*I*c) + 36700160*I*a^8*e^(29*I*d*x + 15
*I*c) + 5025341440*I*a^8*e^(27*I*d*x + 13*I*c) + 44995829760*I*a^8*e^(25*I*
d*x + 11*I*c) + 211521945600*I*a^8*e^(23*I*d*x + 9*I*c) + 647303086080*I*a^
8*e^(21*I*d*x + 7*I*c) + 1402445291520*I*a^8*e^(19*I*d*x + 5*I*c) + 2242792
366080*I*a^8*e^(17*I*d*x + 3*I*c) + 2703768453120*I*a^8*e^(15*I*d*x + I*c)
+ 2476532531200*I*a^8*e^(13*I*d*x - I*c) + 1718329303040*I*a^8*e^(11*I*d*x
- 3*I*c) + 890140303360*I*a^8*e^(9*I*d*x - 5*I*c) + 334132592640*I*a^8*e^(7
*I*d*x - 7*I*c) + 85969551360*I*a^8*e^(5*I*d*x - 9*I*c) + 13577625600*I*a^8
*e^(3*I*d*x - 11*I*c) + 993484800*I*a^8*e^(I*d*x - 13*I*c))/(d*e^(28*I*d*x

```
+ 14*I*c) + 14*d*e^(26*I*d*x + 12*I*c) + 91*d*e^(24*I*d*x + 10*I*c) + 364*d
*e^(22*I*d*x + 8*I*c) + 1001*d*e^(20*I*d*x + 6*I*c) + 2002*d*e^(18*I*d*x +
4*I*c) + 3003*d*e^(16*I*d*x + 2*I*c) + 3003*d*e^(12*I*d*x - 2*I*c) + 2002*d
*e^(10*I*d*x - 4*I*c) + 1001*d*e^(8*I*d*x - 6*I*c) + 364*d*e^(6*I*d*x - 8*I
*c) + 91*d*e^(4*I*d*x - 10*I*c) + 14*d*e^(2*I*d*x - 12*I*c) + 3432*d*e^(14*
I*d*x) + d*e^(-14*I*c))
```

maple [A] time = 0.60, size = 356, normalized size = 1.74

$$\frac{40ia^8\left(\sin^8(dx+c)\right)}{3d\cos(dx+c)}+\frac{72ia^8\cos(dx+c)\left(\sin^4(dx+c)\right)}{d}-\frac{8ia^8\left(\sin^8(dx+c)\right)}{3d\cos(dx+c)^3}+\frac{40ia^8\cos(dx+c)\left(\sin^6(dx+c\right.}{3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 40/3*I/d*a^8*sin(d*x+c)^8/cos(d*x+c)+72*I/d*a^8*cos(d*x+c)*sin(d*x+c)^4-8/3
*I/d*a^8*sin(d*x+c)^8/cos(d*x+c)^3+40/3*I/d*a^8*cos(d*x+c)*sin(d*x+c)^6+344
/3*I/d*a^8*cos(d*x+c)*sin(d*x+c)^2+688/3*I/d*a^8*cos(d*x+c)-8/3*I/d*a^8*cos
(d*x+c)^3+56*I/d*a^8*sin(d*x+c)^6/cos(d*x+c)+1/3/d*cos(d*x+c)^2*sin(d*x+c)*
a^8-3449/24*a^8*sin(d*x+c)/d+1/4/d*a^8*sin(d*x+c)^9/cos(d*x+c)^4-5/8/d*a^8*
sin(d*x+c)^9/cos(d*x+c)^2-14/d*a^8*sin(d*x+c)^7/cos(d*x+c)^2-5/8*a^8*sin(d*
x+c)^7/d-119/8*a^8*sin(d*x+c)^5/d+1155/8/d*a^8*ln(sec(d*x+c)+tan(d*x+c))-13
79/24*a^8*sin(d*x+c)^3/d
```

maxima [B] time = 0.46, size = 352, normalized size = 1.72

$$-\frac{128i\,a^8\cos(dx+c)^3+448\,a^8\sin(dx+c)^3+896i\left(\cos(dx+c)^3-\frac{3}{\cos(dx+c)}-6\,\cos(dx+c)\right)a^8+128i\left(\cos(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] -1/48*(128*I*a^8*cos(d*x + c)^3 + 448*a^8*sin(d*x + c)^3 + 896*I*(cos(d*x +
 c)^3 - 3/cos(d*x + c) - 6*cos(d*x + c))*a^8 + 128*I*(cos(d*x + c)^3 - (9*c
os(d*x + c)^2 - 1)/cos(d*x + c)^3 - 9*cos(d*x + c))*a^8 + 896*I*(cos(d*x +
c)^3 - 3*cos(d*x + c))*a^8 + (16*sin(d*x + c)^3 - 6*(13*sin(d*x + c)^3 - 11
*sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(d*x + c)^2 + 1) - 105*log(sin(d*x +
c) + 1) + 105*log(sin(d*x + c) - 1) + 144*sin(d*x + c))*a^8 + 112*(4*sin(d*
x + c)^3 - 6*sin(d*x + c)/(sin(d*x + c)^2 - 1) - 15*log(sin(d*x + c) + 1) +
 15*log(sin(d*x + c) - 1) + 24*sin(d*x + c))*a^8 + 560*(2*sin(d*x + c)^3 -
3*log(sin(d*x + c) + 1) + 3*log(sin(d*x + c) - 1) + 6*sin(d*x + c))*a^8 + 1
6*(sin(d*x + c)^3 - 3*sin(d*x + c))*a^8)/d
```

mupad [B] time = 7.82, size = 343, normalized size = 1.67

$$\frac{\frac{1147\,a^8\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}}{4}+\frac{a^8\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9\,3505\mathrm{i}}{4}-\frac{5639\,a^8\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8}{3}-a^8\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7\,3585\mathrm{i}+\frac{25993\,a^8\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6}{6}+\frac{a^8\,\mathrm{ta}}{}}{d\left(-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{11}-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}\,3\mathrm{i}+7\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8\,13\mathrm{i}-18\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7-\tan\left(\frac{c}{2}+\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] ((27565*a^8*tan(c/2 + (d*x)/2)^2)/12 - (a^8*tan(c/2 + (d*x)/2)^3*12041i)/3
- 4575*a^8*tan(c/2 + (d*x)/2)^4 + (a^8*tan(c/2 + (d*x)/2)^5*33847i)/6 + (25
993*a^8*tan(c/2 + (d*x)/2)^6)/6 - a^8*tan(c/2 + (d*x)/2)^7*3585i - (5639*a^
8*tan(c/2 + (d*x)/2)^8)/3 + (a^8*tan(c/2 + (d*x)/2)^9*3505i)/4 + (1147*a^8*
```

```
tan(c/2 + (d*x)/2)^10)/4 - (1360*a^8)/3 + (a^8*tan(c/2 + (d*x)/2)*4293i)/4)
/(d*(3*tan(c/2 + (d*x)/2) - tan(c/2 + (d*x)/2)^2*7i - 13*tan(c/2 + (d*x)/2)
^3 + tan(c/2 + (d*x)/2)^4*18i + 22*tan(c/2 + (d*x)/2)^5 - tan(c/2 + (d*x)/2
)^6*22i - 18*tan(c/2 + (d*x)/2)^7 + tan(c/2 + (d*x)/2)^8*13i + 7*tan(c/2 +
(d*x)/2)^9 - tan(c/2 + (d*x)/2)^10*3i - tan(c/2 + (d*x)/2)^11 + 1i)) + (115
5*a^8*atanh(tan(c/2 + (d*x)/2)))/(4*d)
```

sympy [A] time = 0.91, size = 282, normalized size = 1.38

$$\frac{1155a^8\left(-\frac{\log\left(e^{idx}-ie^{-ic}\right)}{8}+\frac{\log\left(e^{idx}+ie^{-ic}\right)}{8}\right)}{d}+\frac{-2295ia^8e^{7ic}e^{7idx}-5855ia^8e^{5ic}e^{5idx}-5153ia^8e^{3ic}e^{3idx}-1545ia^8e^{ic}e^{idx}}{-12de^{8ic}e^{8idx}-48de^{6ic}e^{6idx}-72de^{4ic}e^{4idx}-48de^{2ic}e^{2idx}-12d}+\begin{cases} \\ \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3*(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] 1155*a**8*(-log(exp(I*d*x) - I*exp(-I*c))/8 + log(exp(I*d*x) + I*exp(-I*c))
/8)/d + (-2295*I*a**8*exp(7*I*c)*exp(7*I*d*x) - 5855*I*a**8*exp(5*I*c)*exp(
5*I*d*x) - 5153*I*a**8*exp(3*I*c)*exp(3*I*d*x) - 1545*I*a**8*exp(I*c)*exp(I
*d*x))/(-12*d*exp(8*I*c)*exp(8*I*d*x) - 48*d*exp(6*I*c)*exp(6*I*d*x) - 72*d
*exp(4*I*c)*exp(4*I*d*x) - 48*d*exp(2*I*c)*exp(2*I*d*x) - 12*d) + Piecewise
(((-32*I*a**8*d*exp(3*I*c)*exp(3*I*d*x) + 480*I*a**8*d*exp(I*c)*exp(I*d*x))
/(3*d**2), Ne(3*d**2, 0)), (x*(32*a**8*exp(3*I*c) - 160*a**8*exp(I*c)), Tru
e))
```

3.93 $\int \cos^5(c+dx)(a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=173

$$-\frac{63ia^8\sec(c+dx)}{2d}-\frac{63a^8\tanh^{-1}(\sin(c+dx))}{2d}-\frac{21i\sec(c+dx)\left(a^8+ia^8\tan(c+dx)\right)}{2d}+\frac{6ia^3\cos^3(c+dx)(a+i}{5d}$$

```
[Out] -63/2*a^8*arctanh(sin(d*x+c))/d-63/2*I*a^8*sec(d*x+c)/d+6/5*I*a^3*cos(d*x+c
)^3*(a+I*a*tan(d*x+c))^5/d-2/5*I*a*cos(d*x+c)^5*(a+I*a*tan(d*x+c))^7/d-42/5
*I*a^2*cos(d*x+c)*(a^2+I*a^2*tan(d*x+c))^3/d-21/2*I*sec(d*x+c)*(a^8+I*a^8*t
an(d*x+c))/d
```

Rubi [A] time = 0.17, antiderivative size = 173, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {3496, 3498, 3486, 3770}

$$-\frac{63ia^8\sec(c+dx)}{2d}-\frac{63a^8\tanh^{-1}(\sin(c+dx))}{2d}+\frac{6ia^3\cos^3(c+dx)(a+ia\tan(c+dx))^5}{5d}-\frac{42ia^2\cos(c+dx)\left(a^2+\right.}{5d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (-63*a^8*ArcTanh[Sin[c + d*x]])/(2*d) - (((63*I)/2)*a^8*Sec[c + d*x])/d + (
((6*I)/5)*a^3*Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^5)/d - (((2*I)/5)*a*Cos
[c + d*x]^5*(a + I*a*Tan[c + d*x])^7)/d - (((42*I)/5)*a^2*Cos[c + d*x]*(a^2
 + I*a^2*Tan[c + d*x])^3)/d - (((21*I)/2)*Sec[c + d*x]*(a^8 + I*a^8*Tan[c +
 d*x]))/d
```

Rule 3486

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

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3498

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$
\begin{aligned}
\int \cos^5(c+dx)(a+ia\tan(c+dx))^8\,dx &= -\frac{2ia\cos^5(c+dx)(a+ia\tan(c+dx))^7}{5d} - \frac{1}{5}\left(9a^2\right)\int \cos^3(c+dx)(a+ia \\
&= \frac{6ia^3\cos^3(c+dx)(a+ia\tan(c+dx))^5}{5d} - \frac{2ia\cos^5(c+dx)(a+ia\tan(c+ \\
&= -\frac{42ia^5\cos(c+dx)(a+ia\tan(c+dx))^3}{5d} + \frac{6ia^3\cos^3(c+dx)(a+ia\tan(\\
&= -\frac{42ia^5\cos(c+dx)(a+ia\tan(c+dx))^3}{5d} + \frac{6ia^3\cos^3(c+dx)(a+ia\tan(\\
&= -\frac{63ia^8\sec(c+dx)}{2d} - \frac{42ia^5\cos(c+dx)(a+ia\tan(c+dx))^3}{5d} + \frac{6ia^3\cos \\
&= -\frac{63a^8\tanh^{-1}(\sin(c+dx))}{2d} - \frac{63ia^8\sec(c+dx)}{2d} - \frac{42ia^5\cos(c+dx)(a+ \\
\end{aligned}
$$

Mathematica [B] time = 7.49, size = 1162, normalized size = 6.72

$$
\frac{\cos^8(c+dx)(48\cos(7c)-48i\sin(7c))\sin(dx)(i\tan(c+dx)a+a)^8}{d(\cos(dx)+i\sin(dx))^8} + \frac{\cos^8(c+dx)(8i\sin(5c)-8\cos(5c))\sin(3dx)}{d(\cos(dx)+i\sin(dx))^8}
$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (63*Cos[8*c]*Cos[c + d*x]^8*Log[Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2]]*(a
 + I*a*Tan[c + d*x])^8)/(2*d*(Cos[d*x] + I*Sin[d*x])^8) - (63*Cos[8*c]*Cos[
c + d*x]^8*Log[Cos[c/2 + (d*x)/2] + Sin[c/2 + (d*x)/2]]*(a + I*a*Tan[c + d*
x])^8)/(2*d*(Cos[d*x] + I*Sin[d*x])^8) + (Cos[5*d*x]*Cos[c + d*x]^8*(((-8*I
)/5)*Cos[3*c] - (8*Sin[3*c])/5)*(a + I*a*Tan[c + d*x])^8)/(d*(Cos[d*x] + I*
Sin[d*x])^8) + (Cos[3*d*x]*Cos[c + d*x]^8*((8*I)*Cos[5*c] + 8*Sin[5*c])*(a
+ I*a*Tan[c + d*x])^8)/(d*(Cos[d*x] + I*Sin[d*x])^8) + (Cos[d*x]*Cos[c + d*
x]^8*((-48*I)*Cos[7*c] - 48*Sin[7*c])*(a + I*a*Tan[c + d*x])^8)/(d*(Cos[d*x
] + I*Sin[d*x])^8) + (Cos[c + d*x]^8*Sec[c]*((-8*I)*Cos[8*c] - 8*Sin[8*c])*
(a + I*a*Tan[c + d*x])^8)/(d*(Cos[d*x] + I*Sin[d*x])^8) - (((63*I)/2)*Cos[c
 + d*x]^8*Log[Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2]]*Sin[8*c]*(a + I*a*Ta
n[c + d*x])^8)/(d*(Cos[d*x] + I*Sin[d*x])^8) + (((63*I)/2)*Cos[c + d*x]^8*L
og[Cos[c/2 + (d*x)/2] + Sin[c/2 + (d*x)/2]]*Sin[8*c]*(a + I*a*Tan[c + d*x])
^8)/(d*(Cos[d*x] + I*Sin[d*x])^8) + (Cos[c + d*x]^8*(48*Cos[7*c] - (48*I)*S
in[7*c])*Sin[d*x]*(a + I*a*Tan[c + d*x])^8)/(d*(Cos[d*x] + I*Sin[d*x])^8) +
 (Cos[c + d*x]^8*(-8*Cos[5*c] + (8*I)*Sin[5*c])*Sin[3*d*x]*(a + I*a*Tan[c +
 d*x])^8)/(d*(Cos[d*x] + I*Sin[d*x])^8) + (Cos[c + d*x]^8*((8*Cos[3*c])/5 -
 ((8*I)/5)*Sin[3*c])*Sin[5*d*x]*(a + I*a*Tan[c + d*x])^8)/(d*(Cos[d*x] + I*
Sin[d*x])^8) + (Cos[c + d*x]^8*(Cos[8*c]/4 - (I/4)*Sin[8*c])*(a + I*a*Tan[c
 + d*x])^8)/(d*(Cos[d*x] + I*Sin[d*x])^8*(Cos[c/2 + (d*x)/2] - Sin[c/2 + (d
*x)/2])^2) - (I*Cos[c + d*x]^8*(8*Cos[8*c] - (8*I)*Sin[8*c])*Sin[(d*x)/2]*(
a + I*a*Tan[c + d*x])^8)/(d*(Cos[c/2] - Sin[c/2])*(Cos[d*x] + I*Sin[d*x])^8
*(Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2])) + (Cos[c + d*x]^8*(-1/4*Cos[8*c
] + (I/4)*Sin[8*c])*(a + I*a*Tan[c + d*x])^8)/(d*(Cos[d*x] + I*Sin[d*x])^8*
(Cos[c/2 + (d*x)/2] + Sin[c/2 + (d*x)/2])^2) + (I*Cos[c + d*x]^8*(8*Cos[8*c
] - (8*I)*Sin[8*c])*Sin[(d*x)/2]*(a + I*a*Tan[c + d*x])^8)/(d*(Cos[c/2] + S
in[c/2])*(Cos[d*x] + I*Sin[d*x])^8*(Cos[c/2 + (d*x)/2] + Sin[c/2 + (d*x)/2]
))
```

fricas [A] time = 0.70, size = 190, normalized size = 1.10

$$\frac{-16i\,a^8e^{(9i\,dx+9i\,c)}+48i\,a^8e^{(7i\,dx+7i\,c)}-336i\,a^8e^{(5i\,dx+5i\,c)}-1050i\,a^8e^{(3i\,dx+3i\,c)}-630i\,a^8e^{(i\,dx+i\,c)}-315\left(a^8e^{(4i\,dx+4i}\right.}{10\left(de^{(4i\,dx+4i\,c)}+2\,de^{(2}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/10*(-16*I*a^8*e^(9*I*d*x + 9*I*c) + 48*I*a^8*e^(7*I*d*x + 7*I*c) - 336*I*
a^8*e^(5*I*d*x + 5*I*c) - 1050*I*a^8*e^(3*I*d*x + 3*I*c) - 630*I*a^8*e^(I*d
*x + I*c) - 315*(a^8*e^(4*I*d*x + 4*I*c) + 2*a^8*e^(2*I*d*x + 2*I*c) + a^8)
*log(e^(I*d*x + I*c) + I) + 315*(a^8*e^(4*I*d*x + 4*I*c) + 2*a^8*e^(2*I*d*x
 + 2*I*c) + a^8)*log(e^(I*d*x + I*c) - I))/(d*e^(4*I*d*x + 4*I*c) + 2*d*e^(
2*I*d*x + 2*I*c) + d)
```

giac [B] time = 9.40, size = 2849, normalized size = 16.47

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/13762560*(882454545*a^8*e^(28*I*d*x + 14*I*c)*log(I*e^(I*d*x + I*c) + 1)
+ 12354363630*a^8*e^(26*I*d*x + 12*I*c)*log(I*e^(I*d*x + I*c) + 1) + 803033
63595*a^8*e^(24*I*d*x + 10*I*c)*log(I*e^(I*d*x + I*c) + 1) + 321213454380*a
^8*e^(22*I*d*x + 8*I*c)*log(I*e^(I*d*x + I*c) + 1) + 883336999545*a^8*e^(20
*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*c) + 1) + 1766673999090*a^8*e^(18*I*d*x
+ 4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 2650010998635*a^8*e^(16*I*d*x + 2*I*c
)*log(I*e^(I*d*x + I*c) + 1) + 2650010998635*a^8*e^(12*I*d*x - 2*I*c)*log(I
*e^(I*d*x + I*c) + 1) + 1766673999090*a^8*e^(10*I*d*x - 4*I*c)*log(I*e^(I*d
*x + I*c) + 1) + 883336999545*a^8*e^(8*I*d*x - 6*I*c)*log(I*e^(I*d*x + I*c)
 + 1) + 321213454380*a^8*e^(6*I*d*x - 8*I*c)*log(I*e^(I*d*x + I*c) + 1) + 8
0303363595*a^8*e^(4*I*d*x - 10*I*c)*log(I*e^(I*d*x + I*c) + 1) + 1235436363
0*a^8*e^(2*I*d*x - 12*I*c)*log(I*e^(I*d*x + I*c) + 1) + 3028583998440*a^8*e
^(14*I*d*x)*log(I*e^(I*d*x + I*c) + 1) + 882454545*a^8*e^(-14*I*c)*log(I*e^
(I*d*x + I*c) + 1) + 448908075*a^8*e^(28*I*d*x + 14*I*c)*log(I*e^(I*d*x + I
*c) - 1) + 6284713050*a^8*e^(26*I*d*x + 12*I*c)*log(I*e^(I*d*x + I*c) - 1)
+ 40850634825*a^8*e^(24*I*d*x + 10*I*c)*log(I*e^(I*d*x + I*c) - 1) + 163402
539300*a^8*e^(22*I*d*x + 8*I*c)*log(I*e^(I*d*x + I*c) - 1) + 449356983075*a
^8*e^(20*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*c) - 1) + 898713966150*a^8*e^(18
*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) - 1) + 1348070949225*a^8*e^(16*I*d*x
+ 2*I*c)*log(I*e^(I*d*x + I*c) - 1) + 1348070949225*a^8*e^(12*I*d*x - 2*I*c
)*log(I*e^(I*d*x + I*c) - 1) + 898713966150*a^8*e^(10*I*d*x - 4*I*c)*log(I*
e^(I*d*x + I*c) - 1) + 449356983075*a^8*e^(8*I*d*x - 6*I*c)*log(I*e^(I*d*x
+ I*c) - 1) + 163402539300*a^8*e^(6*I*d*x - 8*I*c)*log(I*e^(I*d*x + I*c) -
1) + 40850634825*a^8*e^(4*I*d*x - 10*I*c)*log(I*e^(I*d*x + I*c) - 1) + 6284
713050*a^8*e^(2*I*d*x - 12*I*c)*log(I*e^(I*d*x + I*c) - 1) + 1540652513400*
a^8*e^(14*I*d*x)*log(I*e^(I*d*x + I*c) - 1) + 448908075*a^8*e^(-14*I*c)*log
(I*e^(I*d*x + I*c) - 1) - 882454545*a^8*e^(28*I*d*x + 14*I*c)*log(-I*e^(I*d
*x + I*c) + 1) - 12354363630*a^8*e^(26*I*d*x + 12*I*c)*log(-I*e^(I*d*x + I*
c) + 1) - 80303363595*a^8*e^(24*I*d*x + 10*I*c)*log(-I*e^(I*d*x + I*c) + 1)
 - 321213454380*a^8*e^(22*I*d*x + 8*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 8833
36999545*a^8*e^(20*I*d*x + 6*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 17666739990
90*a^8*e^(18*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 2650010998635*a^8
*e^(16*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 2650010998635*a^8*e^(12
*I*d*x - 2*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 1766673999090*a^8*e^(10*I*d*x
 - 4*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 883336999545*a^8*e^(8*I*d*x - 6*I*c
)*log(-I*e^(I*d*x + I*c) + 1) - 321213454380*a^8*e^(6*I*d*x - 8*I*c)*log(-I
```

```
*e^(I*d*x + I*c) + 1) - 80303363595*a^8*e^(4*I*d*x - 10*I*c)*log(-I*e^(I*d*
x + I*c) + 1) - 12354363630*a^8*e^(2*I*d*x - 12*I*c)*log(-I*e^(I*d*x + I*c)
 + 1) - 3028583998440*a^8*e^(14*I*d*x)*log(-I*e^(I*d*x + I*c) + 1) - 882454
545*a^8*e^(-14*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 448908075*a^8*e^(28*I*d*x
 + 14*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 6284713050*a^8*e^(26*I*d*x + 12*I*
c)*log(-I*e^(I*d*x + I*c) - 1) - 40850634825*a^8*e^(24*I*d*x + 10*I*c)*log(
-I*e^(I*d*x + I*c) - 1) - 163402539300*a^8*e^(22*I*d*x + 8*I*c)*log(-I*e^(I
*d*x + I*c) - 1) - 449356983075*a^8*e^(20*I*d*x + 6*I*c)*log(-I*e^(I*d*x +
I*c) - 1) - 898713966150*a^8*e^(18*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) -
1) - 1348070949225*a^8*e^(16*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 1
348070949225*a^8*e^(12*I*d*x - 2*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 8987139
66150*a^8*e^(10*I*d*x - 4*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 449356983075*a
^8*e^(8*I*d*x - 6*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 163402539300*a^8*e^(6*
I*d*x - 8*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 40850634825*a^8*e^(4*I*d*x - 1
0*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 6284713050*a^8*e^(2*I*d*x - 12*I*c)*lo
g(-I*e^(I*d*x + I*c) - 1) - 1540652513400*a^8*e^(14*I*d*x)*log(-I*e^(I*d*x
+ I*c) - 1) - 448908075*a^8*e^(-14*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 25830
*a^8*e^(28*I*d*x + 14*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 361620*a^8*e^(26*I
*d*x + 12*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 2350530*a^8*e^(24*I*d*x + 10*I
*c)*log(I*e^(I*d*x) + e^(-I*c)) - 9402120*a^8*e^(22*I*d*x + 8*I*c)*log(I*e^
(I*d*x) + e^(-I*c)) - 25855830*a^8*e^(20*I*d*x + 6*I*c)*log(I*e^(I*d*x) + e
^(-I*c)) - 51711660*a^8*e^(18*I*d*x + 4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) -
77567490*a^8*e^(16*I*d*x + 2*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 77567490*a^
8*e^(12*I*d*x - 2*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 51711660*a^8*e^(10*I*d
*x - 4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 25855830*a^8*e^(8*I*d*x - 6*I*c)*
log(I*e^(I*d*x) + e^(-I*c)) - 9402120*a^8*e^(6*I*d*x - 8*I*c)*log(I*e^(I*d*
x) + e^(-I*c)) - 2350530*a^8*e^(4*I*d*x - 10*I*c)*log(I*e^(I*d*x) + e^(-I*c
)) - 361620*a^8*e^(2*I*d*x - 12*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 88648560
*a^8*e^(14*I*d*x)*log(I*e^(I*d*x) + e^(-I*c)) - 25830*a^8*e^(-14*I*c)*log(I
*e^(I*d*x) + e^(-I*c)) + 25830*a^8*e^(28*I*d*x + 14*I*c)*log(-I*e^(I*d*x) +
 e^(-I*c)) + 361620*a^8*e^(26*I*d*x + 12*I*c)*log(-I*e^(I*d*x) + e^(-I*c))
+ 2350530*a^8*e^(24*I*d*x + 10*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 9402120*
a^8*e^(22*I*d*x + 8*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 25855830*a^8*e^(20*
I*d*x + 6*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 51711660*a^8*e^(18*I*d*x + 4*
I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 77567490*a^8*e^(16*I*d*x + 2*I*c)*log(-
I*e^(I*d*x) + e^(-I*c)) + 77567490*a^8*e^(12*I*d*x - 2*I*c)*log(-I*e^(I*d*x
) + e^(-I*c)) + 51711660*a^8*e^(10*I*d*x - 4*I*c)*log(-I*e^(I*d*x) + e^(-I*
c)) + 25855830*a^8*e^(8*I*d*x - 6*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 94021
20*a^8*e^(6*I*d*x - 8*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 2350530*a^8*e^(4*
I*d*x - 10*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 361620*a^8*e^(2*I*d*x - 12*I
*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 88648560*a^8*e^(14*I*d*x)*log(-I*e^(I*d*
x) + e^(-I*c)) + 25830*a^8*e^(-14*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 22020
096*I*a^8*e^(33*I*d*x + 19*I*c) - 198180864*I*a^8*e^(31*I*d*x + 17*I*c) - 1
123024896*I*a^8*e^(29*I*d*x + 15*I*c) - 7478575104*I*a^8*e^(27*I*d*x + 13*I
*c) - 45094404096*I*a^8*e^(25*I*d*x + 11*I*c) - 192251953152*I*a^8*e^(23*I*
d*x + 9*I*c) - 572065579008*I*a^8*e^(21*I*d*x + 7*I*c) - 1228696584192*I*a^
8*e^(19*I*d*x + 5*I*c) - 1959538065408*I*a^8*e^(17*I*d*x + 3*I*c) - 2360323
080192*I*a^8*e^(15*I*d*x + I*c) - 2161459593216*I*a^8*e^(13*I*d*x - I*c) -
1499642855424*I*a^8*e^(11*I*d*x - 3*I*c) - 776849719296*I*a^8*e^(9*I*d*x -
5*I*c) - 291606626304*I*a^8*e^(7*I*d*x - 7*I*c) - 75027972096*I*a^8*e^(5*I*
d*x - 9*I*c) - 11849564160*I*a^8*e^(3*I*d*x - 11*I*c) - 867041280*I*a^8*e^(
I*d*x - 13*I*c))/(d*e^(28*I*d*x + 14*I*c) + 14*d*e^(26*I*d*x + 12*I*c) + 91
*d*e^(24*I*d*x + 10*I*c) + 364*d*e^(22*I*d*x + 8*I*c) + 1001*d*e^(20*I*d*x
+ 6*I*c) + 2002*d*e^(18*I*d*x + 4*I*c) + 3003*d*e^(16*I*d*x + 2*I*c) + 3003
*d*e^(12*I*d*x - 2*I*c) + 2002*d*e^(10*I*d*x - 4*I*c) + 1001*d*e^(8*I*d*x -
 6*I*c) + 364*d*e^(6*I*d*x - 8*I*c) + 91*d*e^(4*I*d*x - 10*I*c) + 14*d*e^(2
*I*d*x - 12*I*c) + 3432*d*e^(14*I*d*x) + d*e^(-14*I*c))
```

maple [B] time = 0.62, size = 322, normalized size = 1.86

$$\frac{a^8\left(\sin^9(dx+c)\right)}{2d\cos(dx+c)^2}+\frac{a^8\left(\sin^7(dx+c)\right)}{2d}+\frac{203a^8\left(\sin^5(dx+c)\right)}{10d}+\frac{21a^8\left(\sin^3(dx+c)\right)}{2d}+\frac{283a^8\sin(dx+c)}{10d}-\frac{63a^8 \mathrm{l}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/2/d*a^8*sin(d*x+c)^9/cos(d*x+c)^2+1/2*a^8*sin(d*x+c)^7/d+203/10*a^8*sin(d
*x+c)^5/d+21/2*a^8*sin(d*x+c)^3/d+283/10*a^8*sin(d*x+c)/d-63/2/d*a^8*ln(sec
(d*x+c)+tan(d*x+c))-8/5*I/d*a^8*cos(d*x+c)^5-416/15*I/d*a^8*cos(d*x+c)*sin(
d*x+c)^2-832/15*I/d*a^8*cos(d*x+c)+56/5*I/d*a^8*cos(d*x+c)^3*sin(d*x+c)^2+1
12/15*I/d*a^8*cos(d*x+c)^3-104/5*I/d*a^8*cos(d*x+c)*sin(d*x+c)^4-8*I/d*a^8*
sin(d*x+c)^8/cos(d*x+c)-8*I/d*a^8*cos(d*x+c)*sin(d*x+c)^6+29/5/d*a^8*cos(d*
x+c)^4*sin(d*x+c)-8/5/d*cos(d*x+c)^2*sin(d*x+c)*a^8
```

maximа [B] time = 0.49, size = 326, normalized size = 1.88

$$-\frac{96i\,a^8\cos(dx+c)^5-840\,a^8\sin(dx+c)^5+224i\left(3\cos(dx+c)^5-5\cos(dx+c)^3\right)a^8+224i\left(3\cos(dx+c)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] -1/60*(96*I*a^8*cos(d*x + c)^5 - 840*a^8*sin(d*x + c)^5 + 224*I*(3*cos(d*x
+ c)^5 - 5*cos(d*x + c)^3)*a^8 + 224*I*(3*cos(d*x + c)^5 - 10*cos(d*x + c)^
3 + 15*cos(d*x + c))*a^8 + 96*I*(cos(d*x + c)^5 - 5*cos(d*x + c)^3 + 5/cos(
d*x + c) + 15*cos(d*x + c))*a^8 - (12*sin(d*x + c)^5 + 40*sin(d*x + c)^3 -
30*sin(d*x + c)/(sin(d*x + c)^2 - 1) - 105*log(sin(d*x + c) + 1) + 105*log(
sin(d*x + c) - 1) + 180*sin(d*x + c))*a^8 - 56*(6*sin(d*x + c)^5 + 10*sin(d
*x + c)^3 - 15*log(sin(d*x + c) + 1) + 15*log(sin(d*x + c) - 1) + 30*sin(d*
x + c))*a^8 - 112*(3*sin(d*x + c)^5 - 5*sin(d*x + c)^3)*a^8 - 4*(3*sin(d*x
+ c)^5 - 10*sin(d*x + c)^3 + 15*sin(d*x + c))*a^8)/d
```

mupad [B] time = 7.39, size = 281, normalized size = 1.62

$$-\frac{63\,a^8\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d}+\frac{65\,a^8\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8+a^8\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7 309\mathrm{i}-761\,a^8\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6-a^8\tan\left(\frac{c}{2}\right.}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8 5\mathrm{i}-12\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6 20\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] (a^8*tan(c/2 + (d*x)/2)^3*1223i - (4407*a^8*tan(c/2 + (d*x)/2)^2)/5 + (7351
*a^8*tan(c/2 + (d*x)/2)^4)/5 - a^8*tan(c/2 + (d*x)/2)^5*1109i - 761*a^8*tan
(c/2 + (d*x)/2)^6 + a^8*tan(c/2 + (d*x)/2)^7*309i + 65*a^8*tan(c/2 + (d*x)/
2)^8 + (496*a^8)/5 - a^8*tan(c/2 + (d*x)/2)*431i)/(d*(5*tan(c/2 + (d*x)/2)
- tan(c/2 + (d*x)/2)^2*12i - 20*tan(c/2 + (d*x)/2)^3 + tan(c/2 + (d*x)/2)^4
*26i + 26*tan(c/2 + (d*x)/2)^5 - tan(c/2 + (d*x)/2)^6*20i - 12*tan(c/2 + (d
*x)/2)^7 + tan(c/2 + (d*x)/2)^8*5i + tan(c/2 + (d*x)/2)^9 + 1i)) - (63*a^8*
atanh(tan(c/2 + (d*x)/2)))/d
```

sympy [A] time = 0.92, size = 238, normalized size = 1.38

$$\frac{63a^8\left(\frac{\log\left(e^{idx}-ie^{-ic}\right)}{2}-\frac{\log\left(e^{idx}+ie^{-ic}\right)}{2}\right)}{d}+\frac{17ia^8e^{3ic}e^{3idx}+15ia^8e^{ic}e^{idx}}{-de^{4ic}e^{4idx}-2de^{2ic}e^{2idx}-d}+\begin{cases}-\frac{8ia^8d^2e^{5ic}e^{5idx}-40ia^8d^2e^{3ic}e^{3idx}+240ia^8d^2e^{ic}e^{idx}}{5d^3} & \text{for} \\ x\left(8a^8e^{5ic}-24a^8e^{3ic}+48a^8e^{ic}\right) & \text{oth}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**5*(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] 63*a**8*(log(exp(I*d*x) - I*exp(-I*c))/2 - log(exp(I*d*x) + I*exp(-I*c))/2)
/d + (17*I*a**8*exp(3*I*c)*exp(3*I*d*x) + 15*I*a**8*exp(I*c)*exp(I*d*x))/(-
d*exp(4*I*c)*exp(4*I*d*x) - 2*d*exp(2*I*c)*exp(2*I*d*x) - d) + Piecewise((-
(8*I*a**8*d**2*exp(5*I*c)*exp(5*I*d*x) - 40*I*a**8*d**2*exp(3*I*c)*exp(3*I*
d*x) + 240*I*a**8*d**2*exp(I*c)*exp(I*d*x))/(5*d**3), Ne(5*d**3, 0)), (x*(8
*a**8*exp(5*I*c) - 24*a**8*exp(3*I*c) + 48*a**8*exp(I*c)), True))
```

3.94 $\int \cos^7(c+dx)(a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=152

$$\frac{a^8\tanh^{-1}(\sin(c+dx))}{d}+\frac{2i\cos(c+dx)\left(a^8+ia^8\tan(c+dx)\right)}{d}+\frac{2ia^3\cos^5(c+dx)(a+ia\tan(c+dx))^5}{5d}-\frac{2ia^2\cos}{}$$

```
[Out] a^8*arctanh(sin(d*x+c))/d+2/5*I*a^3*cos(d*x+c)^5*(a+I*a*tan(d*x+c))^5/d-2/7
*I*a*cos(d*x+c)^7*(a+I*a*tan(d*x+c))^7/d-2/3*I*a^2*cos(d*x+c)^3*(a^2+I*a^2*
tan(d*x+c))^3/d+2*I*cos(d*x+c)*(a^8+I*a^8*tan(d*x+c))/d
```

Rubi [A] time = 0.16, antiderivative size = 152, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {3496, 3770}

$$\frac{a^8\tanh^{-1}(\sin(c+dx))}{d}+\frac{2ia^3\cos^5(c+dx)(a+ia\tan(c+dx))^5}{5d}-\frac{2ia^2\cos^3(c+dx)\left(a^2+ia^2\tan(c+dx)\right)^3}{3d}+\frac{2i\,c}{}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^7*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (a^8*ArcTanh[Sin[c + d*x]])/d + (((2*I)/5)*a^3*Cos[c + d*x]^5*(a + I*a*Tan[
c + d*x])^5)/d - (((2*I)/7)*a*Cos[c + d*x]^7*(a + I*a*Tan[c + d*x])^7)/d -
(((2*I)/3)*a^2*Cos[c + d*x]^3*(a^2 + I*a^2*Tan[c + d*x])^3)/d + ((2*I)*Cos[
c + d*x]*(a^8 + I*a^8*Tan[c + d*x]))/d
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\int \cos^7(c+dx)(a+ia\tan(c+dx))^8\,dx &= -\frac{2ia\cos^7(c+dx)(a+ia\tan(c+dx))^7}{7d}-a^2\int \cos^5(c+dx)(a+ia\,\mathrm{ta}\\
&= \frac{2ia^3\cos^5(c+dx)(a+ia\tan(c+dx))^5}{5d}-\frac{2ia\cos^7(c+dx)(a+ia\tan(}{7d}\\
&= -\frac{2ia^5\cos^3(c+dx)(a+ia\tan(c+dx))^3}{3d}+\frac{2ia^3\cos^5(c+dx)(a+ia\,\mathrm{ta}}{5d}\\
&= -\frac{2ia^5\cos^3(c+dx)(a+ia\tan(c+dx))^3}{3d}+\frac{2ia^3\cos^5(c+dx)(a+ia\,\mathrm{ta}}{5d}\\
&= \frac{a^8\tanh^{-1}(\sin(c+dx))}{d}-\frac{2ia^5\cos^3(c+dx)(a+ia\tan(c+dx))^3}{3d}+\frac{2}{}
\end{aligned}$$

Mathematica [B] time = 2.47, size = 305, normalized size = 2.01

$$\frac{a^8\left(\cos\left(\frac{1}{2}(7c+23dx)\right)+i\sin\left(\frac{1}{2}(7c+23dx)\right)\right)\left(-70\sin\left(\frac{1}{2}(c+dx)\right)-42\sin\left(\frac{3}{2}(c+dx)\right)+210\sin\left(\frac{5}{2}(c+dx)\right)+\cdots\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^7*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (a^8*((-70*I)*Cos[(c + d*x)/2] + (42*I)*Cos[(3*(c + d*x))/2] + (210*I)*Cos[
(5*(c + d*x))/2] - (30*I)*Cos[(7*(c + d*x))/2] - 105*Cos[(7*(c + d*x))/2]*L
og[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + 105*Cos[(7*(c + d*x))/2]*Log[Cos[
(c + d*x)/2] + Sin[(c + d*x)/2]] - 70*Sin[(c + d*x)/2] - 42*Sin[(3*(c + d*x
))/2] + 210*Sin[(5*(c + d*x))/2] + 30*Sin[(7*(c + d*x))/2] + (105*I)*Log[Co
s[(c + d*x)/2] - Sin[(c + d*x)/2]]*Sin[(7*(c + d*x))/2] - (105*I)*Log[Cos[(
c + d*x)/2] + Sin[(c + d*x)/2]]*Sin[(7*(c + d*x))/2])*(Cos[(7*c + 23*d*x)/2
] + I*Sin[(7*c + 23*d*x)/2]))/(105*d*(Cos[d*x] + I*Sin[d*x])^8)
```

fricas [A] time = 0.68, size = 96, normalized size = 0.63

$$\frac{-30i\,a^8e^{(7i\,dx+7i\,c)}+42i\,a^8e^{(5i\,dx+5i\,c)}-70i\,a^8e^{(3i\,dx+3i\,c)}+210i\,a^8e^{(i\,dx+i\,c)}+105\,a^8\log\left(e^{(i\,dx+i\,c)}+i\right)-105\,a^8\log\left(e^{(\cdots}\right.}{105\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/105*(-30*I*a^8*e^(7*I*d*x + 7*I*c) + 42*I*a^8*e^(5*I*d*x + 5*I*c) - 70*I*
a^8*e^(3*I*d*x + 3*I*c) + 210*I*a^8*e^(I*d*x + I*c) + 105*a^8*log(e^(I*d*x
+ I*c) + I) - 105*a^8*log(e^(I*d*x + I*c) - I))/d
```

giac [B] time = 12.32, size = 2863, normalized size = 18.84

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/55050240*(1635552135*a^8*e^(28*I*d*x + 14*I*c)*log(I*e^(I*d*x + I*c) + 1)
 + 22897729890*a^8*e^(26*I*d*x + 12*I*c)*log(I*e^(I*d*x + I*c) + 1) + 14883
5244285*a^8*e^(24*I*d*x + 10*I*c)*log(I*e^(I*d*x + I*c) + 1) + 595340977140
*a^8*e^(22*I*d*x + 8*I*c)*log(I*e^(I*d*x + I*c) + 1) + 1637187687135*a^8*e^
(20*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*c) + 1) + 3274375374270*a^8*e^(18*I*d
*x + 4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 4911563061405*a^8*e^(16*I*d*x + 2*
I*c)*log(I*e^(I*d*x + I*c) + 1) + 4911563061405*a^8*e^(12*I*d*x - 2*I*c)*lo
g(I*e^(I*d*x + I*c) + 1) + 3274375374270*a^8*e^(10*I*d*x - 4*I*c)*log(I*e^(
I*d*x + I*c) + 1) + 1637187687135*a^8*e^(8*I*d*x - 6*I*c)*log(I*e^(I*d*x +
I*c) + 1) + 595340977140*a^8*e^(6*I*d*x - 8*I*c)*log(I*e^(I*d*x + I*c) + 1)
 + 148835244285*a^8*e^(4*I*d*x - 10*I*c)*log(I*e^(I*d*x + I*c) + 1) + 22897
729890*a^8*e^(2*I*d*x - 12*I*c)*log(I*e^(I*d*x + I*c) + 1) + 5613214927320*
a^8*e^(14*I*d*x)*log(I*e^(I*d*x + I*c) + 1) + 1635552135*a^8*e^(-14*I*c)*lo
g(I*e^(I*d*x + I*c) + 1) + 1690450650*a^8*e^(28*I*d*x + 14*I*c)*log(I*e^(I*
d*x + I*c) - 1) + 23666309100*a^8*e^(26*I*d*x + 12*I*c)*log(I*e^(I*d*x + I*
c) - 1) + 153831009150*a^8*e^(24*I*d*x + 10*I*c)*log(I*e^(I*d*x + I*c) - 1)
 + 615324036600*a^8*e^(22*I*d*x + 8*I*c)*log(I*e^(I*d*x + I*c) - 1) + 16921
41100650*a^8*e^(20*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*c) - 1) + 338428220130
0*a^8*e^(18*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) - 1) + 5076423301950*a^8*e
^(16*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) - 1) + 5076423301950*a^8*e^(12*I*
d*x - 2*I*c)*log(I*e^(I*d*x + I*c) - 1) + 3384282201300*a^8*e^(10*I*d*x - 4
*I*c)*log(I*e^(I*d*x + I*c) - 1) + 1692141100650*a^8*e^(8*I*d*x - 6*I*c)*lo
```

```
g(I*e^(I*d*x + I*c) - 1) + 615324036600*a^8*e^(6*I*d*x - 8*I*c)*log(I*e^(I*
d*x + I*c) - 1) + 153831009150*a^8*e^(4*I*d*x - 10*I*c)*log(I*e^(I*d*x + I*
c) - 1) + 23666309100*a^8*e^(2*I*d*x - 12*I*c)*log(I*e^(I*d*x + I*c) - 1) +
 5801626630800*a^8*e^(14*I*d*x)*log(I*e^(I*d*x + I*c) - 1) + 1690450650*a^8
*e^(-14*I*c)*log(I*e^(I*d*x + I*c) - 1) - 1635552135*a^8*e^(28*I*d*x + 14*I
*c)*log(-I*e^(I*d*x + I*c) + 1) - 22897729890*a^8*e^(26*I*d*x + 12*I*c)*log
(-I*e^(I*d*x + I*c) + 1) - 148835244285*a^8*e^(24*I*d*x + 10*I*c)*log(-I*e^
(I*d*x + I*c) + 1) - 595340977140*a^8*e^(22*I*d*x + 8*I*c)*log(-I*e^(I*d*x
+ I*c) + 1) - 1637187687135*a^8*e^(20*I*d*x + 6*I*c)*log(-I*e^(I*d*x + I*c)
 + 1) - 3274375374270*a^8*e^(18*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) + 1)
- 4911563061405*a^8*e^(16*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 4911
563061405*a^8*e^(12*I*d*x - 2*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 3274375374
270*a^8*e^(10*I*d*x - 4*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 1637187687135*a^
8*e^(8*I*d*x - 6*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 595340977140*a^8*e^(6*I
*d*x - 8*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 148835244285*a^8*e^(4*I*d*x - 1
0*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 22897729890*a^8*e^(2*I*d*x - 12*I*c)*l
og(-I*e^(I*d*x + I*c) + 1) - 5613214927320*a^8*e^(14*I*d*x)*log(-I*e^(I*d*x
 + I*c) + 1) - 1635552135*a^8*e^(-14*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 169
0450650*a^8*e^(28*I*d*x + 14*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 23666309100
*a^8*e^(26*I*d*x + 12*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 153831009150*a^8*e
^(24*I*d*x + 10*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 615324036600*a^8*e^(22*I
*d*x + 8*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 1692141100650*a^8*e^(20*I*d*x +
 6*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 3384282201300*a^8*e^(18*I*d*x + 4*I*c
)*log(-I*e^(I*d*x + I*c) - 1) - 5076423301950*a^8*e^(16*I*d*x + 2*I*c)*log(
-I*e^(I*d*x + I*c) - 1) - 5076423301950*a^8*e^(12*I*d*x - 2*I*c)*log(-I*e^(
I*d*x + I*c) - 1) - 3384282201300*a^8*e^(10*I*d*x - 4*I*c)*log(-I*e^(I*d*x
+ I*c) - 1) - 1692141100650*a^8*e^(8*I*d*x - 6*I*c)*log(-I*e^(I*d*x + I*c)
- 1) - 615324036600*a^8*e^(6*I*d*x - 8*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 1
53831009150*a^8*e^(4*I*d*x - 10*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 23666309
100*a^8*e^(2*I*d*x - 12*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 5801626630800*a^
8*e^(14*I*d*x)*log(-I*e^(I*d*x + I*c) - 1) - 1690450650*a^8*e^(-14*I*c)*log
(-I*e^(I*d*x + I*c) - 1) - 151725*a^8*e^(28*I*d*x + 14*I*c)*log(I*e^(I*d*x)
 + e^(-I*c)) - 2124150*a^8*e^(26*I*d*x + 12*I*c)*log(I*e^(I*d*x) + e^(-I*c)
) - 13806975*a^8*e^(24*I*d*x + 10*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 552279
00*a^8*e^(22*I*d*x + 8*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 151876725*a^8*e^(
20*I*d*x + 6*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 303753450*a^8*e^(18*I*d*x +
 4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 455630175*a^8*e^(16*I*d*x + 2*I*c)*lo
g(I*e^(I*d*x) + e^(-I*c)) - 455630175*a^8*e^(12*I*d*x - 2*I*c)*log(I*e^(I*d
*x) + e^(-I*c)) - 303753450*a^8*e^(10*I*d*x - 4*I*c)*log(I*e^(I*d*x) + e^(-
I*c)) - 151876725*a^8*e^(8*I*d*x - 6*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 552
27900*a^8*e^(6*I*d*x - 8*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 13806975*a^8*e^
(4*I*d*x - 10*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 2124150*a^8*e^(2*I*d*x - 1
2*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 520720200*a^8*e^(14*I*d*x)*log(I*e^(I*
d*x) + e^(-I*c)) - 151725*a^8*e^(-14*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 151
725*a^8*e^(28*I*d*x + 14*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 2124150*a^8*e^
(26*I*d*x + 12*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 13806975*a^8*e^(24*I*d*x
 + 10*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 55227900*a^8*e^(22*I*d*x + 8*I*c)
*log(-I*e^(I*d*x) + e^(-I*c)) + 151876725*a^8*e^(20*I*d*x + 6*I*c)*log(-I*e
^(I*d*x) + e^(-I*c)) + 303753450*a^8*e^(18*I*d*x + 4*I*c)*log(-I*e^(I*d*x)
+ e^(-I*c)) + 455630175*a^8*e^(16*I*d*x + 2*I*c)*log(-I*e^(I*d*x) + e^(-I*c
)) + 455630175*a^8*e^(12*I*d*x - 2*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 3037
53450*a^8*e^(10*I*d*x - 4*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 151876725*a^8
*e^(8*I*d*x - 6*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 55227900*a^8*e^(6*I*d*x
 - 8*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 13806975*a^8*e^(4*I*d*x - 10*I*c)*
log(-I*e^(I*d*x) + e^(-I*c)) + 2124150*a^8*e^(2*I*d*x - 12*I*c)*log(-I*e^(I
*d*x) + e^(-I*c)) + 520720200*a^8*e^(14*I*d*x)*log(-I*e^(I*d*x) + e^(-I*c))
 + 151725*a^8*e^(-14*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 15728640*I*a^8*e^(
35*I*d*x + 21*I*c) - 198180864*I*a^8*e^(33*I*d*x + 19*I*c) - 1159725056*I*a
^8*e^(31*I*d*x + 17*I*c) - 4125097984*I*a^8*e^(29*I*d*x + 15*I*c) - 9527361
```

```
536*I*a^8*e^(27*I*d*x + 13*I*c) - 12786335744*I*a^8*e^(25*I*d*x + 11*I*c) +
 190840832*I*a^8*e^(23*I*d*x + 9*I*c) + 48882515968*I*a^8*e^(21*I*d*x + 7*I
*c) + 138550444032*I*a^8*e^(19*I*d*x + 5*I*c) + 239314403328*I*a^8*e^(17*I*
d*x + 3*I*c) + 295994130432*I*a^8*e^(15*I*d*x + I*c) + 273474912256*I*a^8*e
^(13*I*d*x - I*c) + 190268309504*I*a^8*e^(11*I*d*x - 3*I*c) + 98635350016*I
*a^8*e^(9*I*d*x - 5*I*c) + 37029412864*I*a^8*e^(7*I*d*x - 7*I*c) + 95273615
36*I*a^8*e^(5*I*d*x - 9*I*c) + 1504706560*I*a^8*e^(3*I*d*x - 11*I*c) + 1101
00480*I*a^8*e^(I*d*x - 13*I*c))/(d*e^(28*I*d*x + 14*I*c) + 14*d*e^(26*I*d*x
 + 12*I*c) + 91*d*e^(24*I*d*x + 10*I*c) + 364*d*e^(22*I*d*x + 8*I*c) + 1001
*d*e^(20*I*d*x + 6*I*c) + 2002*d*e^(18*I*d*x + 4*I*c) + 3003*d*e^(16*I*d*x
+ 2*I*c) + 3003*d*e^(12*I*d*x - 2*I*c) + 2002*d*e^(10*I*d*x - 4*I*c) + 1001
*d*e^(8*I*d*x - 6*I*c) + 364*d*e^(6*I*d*x - 8*I*c) + 91*d*e^(4*I*d*x - 10*I
*c) + 14*d*e^(2*I*d*x - 12*I*c) + 3432*d*e^(14*I*d*x) + d*e^(-14*I*c))
```

maple [B] time = 0.61, size = 385, normalized size = 2.53

$$-\frac{29a^8\left(\sin^7(dx+c)\right)}{7d}-\frac{a^8\left(\sin^5(dx+c)\right)}{5d}-\frac{a^8\left(\sin^3(dx+c)\right)}{3d}+\frac{139a^8\sin(dx+c)}{105d}+\frac{a^8\ln(\sec(dx+c)+\tan(dx+}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] -29/7*a^8*sin(d*x+c)^7/d-1/5*a^8*sin(d*x+c)^5/d-1/3*a^8*sin(d*x+c)^3/d+139/
105*a^8*sin(d*x+c)/d+1/d*a^8*ln(sec(d*x+c)+tan(d*x+c))+128/35*I/d*a^8*cos(d
*x+c)-32/5*I/d*a^8*cos(d*x+c)^3*sin(d*x+c)^2-10/d*a^8*sin(d*x+c)^3*cos(d*x+
c)^4-232/35/d*a^8*cos(d*x+c)^4*sin(d*x+c)+122/105/d*cos(d*x+c)^2*sin(d*x+c)
*a^8+64/35*I/d*a^8*cos(d*x+c)*sin(d*x+c)^2-8/7*I/d*a^8*cos(d*x+c)^7+48/35*I
/d*a^8*cos(d*x+c)*sin(d*x+c)^4+29/7/d*a^8*cos(d*x+c)^6*sin(d*x+c)+16/5*I/d*
a^8*cos(d*x+c)^5-8*I/d*a^8*sin(d*x+c)^4*cos(d*x+c)^3+8/7*I/d*a^8*cos(d*x+c)
*sin(d*x+c)^6-64/15*I/d*a^8*cos(d*x+c)^3+8*I/d*a^8*sin(d*x+c)^2*cos(d*x+c)^
5
```

maxima [B] time = 0.36, size = 309, normalized size = 2.03

$$-\frac{240i\,a^8\cos(dx+c)^7+840\,a^8\sin(dx+c)^7+112i\left(15\,\cos(dx+c)^7-42\,\cos(dx+c)^5+35\,\cos(dx+c)^3\right)a^8+}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] -1/210*(240*I*a^8*cos(d*x + c)^7 + 840*a^8*sin(d*x + c)^7 + 112*I*(15*cos(d
*x + c)^7 - 42*cos(d*x + c)^5 + 35*cos(d*x + c)^3)*a^8 + 336*I*(5*cos(d*x +
 c)^7 - 7*cos(d*x + c)^5)*a^8 + 48*I*(5*cos(d*x + c)^7 - 21*cos(d*x + c)^5
+ 35*cos(d*x + c)^3 - 35*cos(d*x + c))*a^8 + (30*sin(d*x + c)^7 + 42*sin(d*
x + c)^5 + 70*sin(d*x + c)^3 - 105*log(sin(d*x + c) + 1) + 105*log(sin(d*x
+ c) - 1) + 210*sin(d*x + c))*a^8 + 56*(15*sin(d*x + c)^7 - 42*sin(d*x + c)
^5 + 35*sin(d*x + c)^3)*a^8 + 420*(5*sin(d*x + c)^7 - 7*sin(d*x + c)^5)*a^8
 + 6*(5*sin(d*x + c)^7 - 21*sin(d*x + c)^5 + 35*sin(d*x + c)^3 - 35*sin(d*x
 + c))*a^8)/d
```

mupad [B] time = 6.69, size = 207, normalized size = 1.36

$$\frac{2\,a^8\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d}+\frac{a^8\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5 16\mathrm{i}-\frac{80\,a^8\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4}{3}-\frac{a^8\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3 224\mathrm{i}}{3}+\frac{224\,a^8\,\mathrm{t}}{}}{d\left(-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6 7\mathrm{i}+21\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4 35\mathrm{i}-35\,\mathrm{ta}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^7*(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] (2*a^8*atanh(tan(c/2 + (d*x)/2)))/d + ((224*a^8*tan(c/2 + (d*x)/2)^2)/5 - (
a^8*tan(c/2 + (d*x)/2)^3*224i)/3 - (80*a^8*tan(c/2 + (d*x)/2)^4)/3 + a^8*ta
n(c/2 + (d*x)/2)^5*16i - (304*a^8)/105 + (a^8*tan(c/2 + (d*x)/2)*304i)/15)/
(d*(7*tan(c/2 + (d*x)/2) - tan(c/2 + (d*x)/2)^2*21i - 35*tan(c/2 + (d*x)/2)
^3 + tan(c/2 + (d*x)/2)^4*35i + 21*tan(c/2 + (d*x)/2)^5 - tan(c/2 + (d*x)/2
)^6*7i - tan(c/2 + (d*x)/2)^7 + 1i))
```

sympy [A] time = 1.01, size = 189, normalized size = 1.24

$$\frac{a^8\left(-\log\left(e^{idx}-ie^{-ic}\right)+\log\left(e^{idx}+ie^{-ic}\right)\right)}{d}+\begin{cases}\frac{-30ia^8d^3e^{7ic}e^{7idx}+42ia^8d^3e^{5ic}e^{5idx}-70ia^8d^3e^{3ic}e^{3idx}+210ia^8d^3e^{ic}e^{idx}}{105d^4} & \text{for } 105d^4 \neq 0\\ x\left(2a^8e^{7ic}-2a^8e^{5ic}+2a^8e^{3ic}-2a^8e^{ic}\right) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**7*(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] a**8*(-log(exp(I*d*x) - I*exp(-I*c)) + log(exp(I*d*x) + I*exp(-I*c)))/d + P
iecewise(((-30*I*a**8*d**3*exp(7*I*c)*exp(7*I*d*x) + 42*I*a**8*d**3*exp(5*I
*c)*exp(5*I*d*x) - 70*I*a**8*d**3*exp(3*I*c)*exp(3*I*d*x) + 210*I*a**8*d**3
*exp(I*c)*exp(I*d*x))/(105*d**4), Ne(105*d**4, 0)), (x*(2*a**8*exp(7*I*c) -
 2*a**8*exp(5*I*c) + 2*a**8*exp(3*I*c) - 2*a**8*exp(I*c)), True))
```

3.95 $\int \cos^9(c+dx)(a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=66

$$-\frac{i\cos^9(c+dx)(a+ia\tan(c+dx))^8}{9d}-\frac{ia\cos^7(c+dx)(a+ia\tan(c+dx))^7}{63d}$$

```
[Out] -1/63*I*a*cos(d*x+c)^7*(a+I*a*tan(d*x+c))^7/d-1/9*I*cos(d*x+c)^9*(a+I*a*tan
(d*x+c))^8/d
```

Rubi [A] time = 0.07, antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3497, 3488}

$$-\frac{i\cos^9(c+dx)(a+ia\tan(c+dx))^8}{9d}-\frac{ia\cos^7(c+dx)(a+ia\tan(c+dx))^7}{63d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^9*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((-I/63)*a*Cos[c + d*x]^7*(a + I*a*Tan[c + d*x])^7)/d - ((I/9)*Cos[c + d*x]
^9*(a + I*a*Tan[c + d*x])^8)/d
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rubi steps

$$\begin{aligned}\int \cos^9(c+dx)(a+ia\tan(c+dx))^8\,dx &= -\frac{i\cos^9(c+dx)(a+ia\tan(c+dx))^8}{9d}+\frac{1}{9}a\int \cos^7(c+dx)(a+ia\tan(c\\ &= -\frac{ia\cos^7(c+dx)(a+ia\tan(c+dx))^7}{63d}-\frac{i\cos^9(c+dx)(a+ia\tan(c+dx\end{aligned}$$

Mathematica [A] time = 0.76, size = 50, normalized size = 0.76

$$\frac{a^8(8\cos(c+dx)-i\sin(c+dx))(\sin(8(c+dx))-i\cos(8(c+dx)))}{63d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^9*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (a^8*(8*Cos[c + d*x] - I*Sin[c + d*x])*((-I)*Cos[8*(c + d*x)] + Sin[8*(c +
d*x)]))/(63*d)
```

fricas [A] time = 0.50, size = 34, normalized size = 0.52

$$\frac{-7i\,a^8e^{(9i\,dx+9i\,c)} - 9i\,a^8e^{(7i\,dx+7i\,c)}}{126\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/126*(-7*I*a^8*e^(9*I*d*x + 9*I*c) - 9*I*a^8*e^(7*I*d*x + 7*I*c))/d
```

giac [B] time = 15.79, size = 2451, normalized size = 37.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/330301440*(7096716585*a^8*e^(24*I*d*x + 12*I*c)*log(I*e^(I*d*x + I*c) + 1
) + 85160599020*a^8*e^(22*I*d*x + 10*I*c)*log(I*e^(I*d*x + I*c) + 1) + 4683
83294610*a^8*e^(20*I*d*x + 8*I*c)*log(I*e^(I*d*x + I*c) + 1) + 156127764870
0*a^8*e^(18*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*c) + 1) + 3512874709575*a^8*e
^(16*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 5620599535320*a^8*e^(14*I*
d*x + 2*I*c)*log(I*e^(I*d*x + I*c) + 1) + 5620599535320*a^8*e^(10*I*d*x - 2
*I*c)*log(I*e^(I*d*x + I*c) + 1) + 3512874709575*a^8*e^(8*I*d*x - 4*I*c)*lo
g(I*e^(I*d*x + I*c) + 1) + 1561277648700*a^8*e^(6*I*d*x - 6*I*c)*log(I*e^(I
*d*x + I*c) + 1) + 468383294610*a^8*e^(4*I*d*x - 8*I*c)*log(I*e^(I*d*x + I*
c) + 1) + 85160599020*a^8*e^(2*I*d*x - 10*I*c)*log(I*e^(I*d*x + I*c) + 1) +
 6557366124540*a^8*e^(12*I*d*x)*log(I*e^(I*d*x + I*c) + 1) + 7096716585*a^8
*e^(-12*I*c)*log(I*e^(I*d*x + I*c) + 1) + 7095485250*a^8*e^(24*I*d*x + 12*I
*c)*log(I*e^(I*d*x + I*c) - 1) + 85145823000*a^8*e^(22*I*d*x + 10*I*c)*log(
I*e^(I*d*x + I*c) - 1) + 468302026500*a^8*e^(20*I*d*x + 8*I*c)*log(I*e^(I*d
*x + I*c) - 1) + 1561006755000*a^8*e^(18*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*
c) - 1) + 3512265198750*a^8*e^(16*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) - 1)
 + 5619624318000*a^8*e^(14*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) - 1) + 5619
624318000*a^8*e^(10*I*d*x - 2*I*c)*log(I*e^(I*d*x + I*c) - 1) + 35122651987
50*a^8*e^(8*I*d*x - 4*I*c)*log(I*e^(I*d*x + I*c) - 1) + 1561006755000*a^8*e
^(6*I*d*x - 6*I*c)*log(I*e^(I*d*x + I*c) - 1) + 468302026500*a^8*e^(4*I*d*x
 - 8*I*c)*log(I*e^(I*d*x + I*c) - 1) + 85145823000*a^8*e^(2*I*d*x - 10*I*c)
*log(I*e^(I*d*x + I*c) - 1) + 6556228371000*a^8*e^(12*I*d*x)*log(I*e^(I*d*x
 + I*c) - 1) + 7095485250*a^8*e^(-12*I*c)*log(I*e^(I*d*x + I*c) - 1) - 7096
716585*a^8*e^(24*I*d*x + 12*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 85160599020*
a^8*e^(22*I*d*x + 10*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 468383294610*a^8*e^
(20*I*d*x + 8*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 1561277648700*a^8*e^(18*I*
d*x + 6*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 3512874709575*a^8*e^(16*I*d*x +
4*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 5620599535320*a^8*e^(14*I*d*x + 2*I*c)
*log(-I*e^(I*d*x + I*c) + 1) - 5620599535320*a^8*e^(10*I*d*x - 2*I*c)*log(-
I*e^(I*d*x + I*c) + 1) - 3512874709575*a^8*e^(8*I*d*x - 4*I*c)*log(-I*e^(I*
d*x + I*c) + 1) - 1561277648700*a^8*e^(6*I*d*x - 6*I*c)*log(-I*e^(I*d*x + I
*c) + 1) - 468383294610*a^8*e^(4*I*d*x - 8*I*c)*log(-I*e^(I*d*x + I*c) + 1)
 - 85160599020*a^8*e^(2*I*d*x - 10*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 65573
66124540*a^8*e^(12*I*d*x)*log(-I*e^(I*d*x + I*c) + 1) - 7096716585*a^8*e^(-
12*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 7095485250*a^8*e^(24*I*d*x + 12*I*c)*
log(-I*e^(I*d*x + I*c) - 1) - 85145823000*a^8*e^(22*I*d*x + 10*I*c)*log(-I*
e^(I*d*x + I*c) - 1) - 468302026500*a^8*e^(20*I*d*x + 8*I*c)*log(-I*e^(I*d*
x + I*c) - 1) - 1561006755000*a^8*e^(18*I*d*x + 6*I*c)*log(-I*e^(I*d*x + I*
c) - 1) - 3512265198750*a^8*e^(16*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) - 1
) - 5619624318000*a^8*e^(14*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 56
19624318000*a^8*e^(10*I*d*x - 2*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 35122651
98750*a^8*e^(8*I*d*x - 4*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 1561006755000*a
```

```
^8*e^(6*I*d*x - 6*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 468302026500*a^8*e^(4*
I*d*x - 8*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 85145823000*a^8*e^(2*I*d*x - 1
0*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 6556228371000*a^8*e^(12*I*d*x)*log(-I*
e^(I*d*x + I*c) - 1) - 7095485250*a^8*e^(-12*I*c)*log(-I*e^(I*d*x + I*c) -
1) - 1231335*a^8*e^(24*I*d*x + 12*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 147760
20*a^8*e^(22*I*d*x + 10*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 81268110*a^8*e^(
20*I*d*x + 8*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 270893700*a^8*e^(18*I*d*x +
 6*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 609510825*a^8*e^(16*I*d*x + 4*I*c)*lo
g(I*e^(I*d*x) + e^(-I*c)) - 975217320*a^8*e^(14*I*d*x + 2*I*c)*log(I*e^(I*d
*x) + e^(-I*c)) - 975217320*a^8*e^(10*I*d*x - 2*I*c)*log(I*e^(I*d*x) + e^(-
I*c)) - 609510825*a^8*e^(8*I*d*x - 4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 270
893700*a^8*e^(6*I*d*x - 6*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 81268110*a^8*e
^(4*I*d*x - 8*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 14776020*a^8*e^(2*I*d*x -
10*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 1137753540*a^8*e^(12*I*d*x)*log(I*e^(
I*d*x) + e^(-I*c)) - 1231335*a^8*e^(-12*I*c)*log(I*e^(I*d*x) + e^(-I*c)) +
1231335*a^8*e^(24*I*d*x + 12*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 14776020*a
^8*e^(22*I*d*x + 10*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 81268110*a^8*e^(20*
I*d*x + 8*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 270893700*a^8*e^(18*I*d*x + 6
*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 609510825*a^8*e^(16*I*d*x + 4*I*c)*log
(-I*e^(I*d*x) + e^(-I*c)) + 975217320*a^8*e^(14*I*d*x + 2*I*c)*log(-I*e^(I*
d*x) + e^(-I*c)) + 975217320*a^8*e^(10*I*d*x - 2*I*c)*log(-I*e^(I*d*x) + e^
(-I*c)) + 609510825*a^8*e^(8*I*d*x - 4*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) +
270893700*a^8*e^(6*I*d*x - 6*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 81268110*a
^8*e^(4*I*d*x - 8*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 14776020*a^8*e^(2*I*d
*x - 10*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 1137753540*a^8*e^(12*I*d*x)*log
(-I*e^(I*d*x) + e^(-I*c)) + 1231335*a^8*e^(-12*I*c)*log(-I*e^(I*d*x) + e^(-
I*c)) - 18350080*I*a^8*e^(33*I*d*x + 21*I*c) - 243793920*I*a^8*e^(31*I*d*x
+ 19*I*c) - 1494220800*I*a^8*e^(29*I*d*x + 17*I*c) - 5594152960*I*a^8*e^(27
*I*d*x + 15*I*c) - 14273740800*I*a^8*e^(25*I*d*x + 13*I*c) - 26211778560*I*
a^8*e^(23*I*d*x + 11*I*c) - 35641098240*I*a^8*e^(21*I*d*x + 9*I*c) - 363331
58400*I*a^8*e^(19*I*d*x + 7*I*c) - 27768913920*I*a^8*e^(17*I*d*x + 5*I*c) -
 15715532800*I*a^8*e^(15*I*d*x + 3*I*c) - 6401556480*I*a^8*e^(13*I*d*x + I*
c) - 1777336320*I*a^8*e^(11*I*d*x - I*c) - 301465600*I*a^8*e^(9*I*d*x - 3*I
*c) - 23592960*I*a^8*e^(7*I*d*x - 5*I*c))/(d*e^(24*I*d*x + 12*I*c) + 12*d*e
^(22*I*d*x + 10*I*c) + 66*d*e^(20*I*d*x + 8*I*c) + 220*d*e^(18*I*d*x + 6*I*
c) + 495*d*e^(16*I*d*x + 4*I*c) + 792*d*e^(14*I*d*x + 2*I*c) + 792*d*e^(10*
I*d*x - 2*I*c) + 495*d*e^(8*I*d*x - 4*I*c) + 220*d*e^(6*I*d*x - 6*I*c) + 66
*d*e^(4*I*d*x - 8*I*c) + 12*d*e^(2*I*d*x - 10*I*c) + 924*d*e^(12*I*d*x) + d
*e^(-12*I*c))
```

maple [B] time = 0.69, size = 447, normalized size = 6.77

$$\frac{a^8(\sin^9(dx+c))}{9} - 8ia^8\left(-\frac{(\sin^6(dx+c))(\cos^3(dx+c))}{9} - \frac{2(\sin^4(dx+c))(\cos^3(dx+c))}{21} - \frac{8(\cos^3(dx+c))(\sin^2(dx+c))}{105} - \frac{16(\cos^3(dx+c))}{315}\right) - 28a^8$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/d*(1/9*a^8*sin(d*x+c)^9-8*I*a^8*(-1/9*sin(d*x+c)^6*cos(d*x+c)^3-2/21*sin(
d*x+c)^4*cos(d*x+c)^3-8/105*cos(d*x+c)^3*sin(d*x+c)^2-16/315*cos(d*x+c)^3)-
28*a^8*(-1/9*sin(d*x+c)^5*cos(d*x+c)^4-5/63*sin(d*x+c)^3*cos(d*x+c)^4-1/21*
sin(d*x+c)*cos(d*x+c)^4+1/63*(2+cos(d*x+c)^2)*sin(d*x+c))+56*I*a^8*(-1/9*si
n(d*x+c)^4*cos(d*x+c)^5-4/63*sin(d*x+c)^2*cos(d*x+c)^5-8/315*cos(d*x+c)^5)+
70*a^8*(-1/9*sin(d*x+c)^3*cos(d*x+c)^6-1/21*sin(d*x+c)*cos(d*x+c)^6+1/105*(
8/3+cos(d*x+c)^4+4/3*cos(d*x+c)^2)*sin(d*x+c))-56*I*a^8*(-1/9*sin(d*x+c)^2*
cos(d*x+c)^7-2/63*cos(d*x+c)^7)-28*a^8*(-1/9*sin(d*x+c)*cos(d*x+c)^8+1/63*(
16/5+cos(d*x+c)^6+6/5*cos(d*x+c)^4+8/5*cos(d*x+c)^2)*sin(d*x+c))-8/9*I*a^8*
```

```
cos(d*x+c)^9+1/9*a^8*(128/35+cos(d*x+c)^8+8/7*cos(d*x+c)^6+48/35*cos(d*x+c)
^4+64/35*cos(d*x+c)^2)*sin(d*x+c))
```

maxima [B] time = 0.48, size = 302, normalized size = 4.58

$$-\frac{280i\,a^8\cos(dx+c)^9 - 35\,a^8\sin(dx+c)^9 + 56i\left(35\,\cos(dx+c)^9 - 90\,\cos(dx+c)^7 + 63\,\cos(dx+c)^5\right)a^8 +}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] -1/315*(280*I*a^8*cos(d*x + c)^9 - 35*a^8*sin(d*x + c)^9 + 56*I*(35*cos(d*x
 + c)^9 - 90*cos(d*x + c)^7 + 63*cos(d*x + c)^5)*a^8 + 8*I*(35*cos(d*x + c)
^9 - 135*cos(d*x + c)^7 + 189*cos(d*x + c)^5 - 105*cos(d*x + c)^3)*a^8 + 28
0*I*(7*cos(d*x + c)^9 - 9*cos(d*x + c)^7)*a^8 - 70*(35*sin(d*x + c)^9 - 90*
sin(d*x + c)^7 + 63*sin(d*x + c)^5)*a^8 - 28*(35*sin(d*x + c)^9 - 135*sin(d
*x + c)^7 + 189*sin(d*x + c)^5 - 105*sin(d*x + c)^3)*a^8 - (35*sin(d*x + c)
^9 - 180*sin(d*x + c)^7 + 378*sin(d*x + c)^5 - 420*sin(d*x + c)^3 + 315*sin
(d*x + c))*a^8 - 140*(7*sin(d*x + c)^9 - 9*sin(d*x + c)^7)*a^8)/d
```

mupad [B] time = 3.62, size = 37, normalized size = 0.56

$$-\frac{2\,a^8\,\left(\frac{\mathrm{e}^{c\,7\mathrm{i}+d\,x\,7\mathrm{i}}\,9\mathrm{i}}{4}+\frac{\mathrm{e}^{c\,9\mathrm{i}+d\,x\,9\mathrm{i}}\,7\mathrm{i}}{4}\right)}{63\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^9*(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] -(2*a^8*((exp(c*7i + d*x*7i)*9i)/4 + (exp(c*9i + d*x*9i)*7i)/4))/(63*d)
```

sympy [A] time = 0.97, size = 82, normalized size = 1.24

$$\begin{cases} \frac{-14ia^8de^{9ic}e^{9idx}-18ia^8de^{7ic}e^{7idx}}{252d^2} & \text{for}\ 252d^2 \neq 0 \\ x\left(\frac{a^8e^{9ic}}{2}+\frac{a^8e^{7ic}}{2}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**9*(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Piecewise(((-14*I*a**8*d*exp(9*I*c)*exp(9*I*d*x) - 18*I*a**8*d*exp(7*I*c)*e
xp(7*I*d*x))/(252*d**2), Ne(252*d**2, 0)), (x*(a**8*exp(9*I*c)/2 + a**8*exp
(7*I*c)/2), True))
```

3.96 $\int \cos^{11}(c+dx)(a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=136

$$-\frac{2ia^3\cos^5(c+dx)(a+ia\tan(c+dx))^5}{1155d}-\frac{2ia^2\cos^7(c+dx)(a+ia\tan(c+dx))^6}{231d}-\frac{i\cos^{11}(c+dx)(a+ia\tan(c+dx}{11d}$$

```
[Out] -2/1155*I*a^3*cos(d*x+c)^5*(a+I*a*tan(d*x+c))^5/d-2/231*I*a^2*cos(d*x+c)^7*
(a+I*a*tan(d*x+c))^6/d-1/33*I*a*cos(d*x+c)^9*(a+I*a*tan(d*x+c))^7/d-1/11*I*
cos(d*x+c)^11*(a+I*a*tan(d*x+c))^8/d
```

Rubi [A] time = 0.16, antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {3497, 3488}

$$-\frac{2ia^2\cos^7(c+dx)(a+ia\tan(c+dx))^6}{231d}-\frac{2ia^3\cos^5(c+dx)(a+ia\tan(c+dx))^5}{1155d}-\frac{i\cos^{11}(c+dx)(a+ia\tan(c+dx}{11d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^11*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (((-2*I)/1155)*a^3*Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^5)/d - (((2*I)/231
)*a^2*Cos[c + d*x]^7*(a + I*a*Tan[c + d*x])^6)/d - ((I/33)*a*Cos[c + d*x]^9
*(a + I*a*Tan[c + d*x])^7)/d - ((I/11)*Cos[c + d*x]^11*(a + I*a*Tan[c + d*x
])^8)/d
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rubi steps

$$\begin{aligned}
\int \cos^{11}(c+dx)(a+ia\tan(c+dx))^8\,dx &= -\frac{i\cos^{11}(c+dx)(a+ia\tan(c+dx))^8}{11d}+\frac{1}{11}(3a)\int \cos^9(c+dx)(a+ia\,\mathrm{t}\\
&= -\frac{ia\cos^9(c+dx)(a+ia\tan(c+dx))^7}{33d}-\frac{i\cos^{11}(c+dx)(a+ia\tan(c+}{11d}\\
&= -\frac{2ia^2\cos^7(c+dx)(a+ia\tan(c+dx))^6}{231d}-\frac{ia\cos^9(c+dx)(a+ia\tan(c}{33d}\\
&= -\frac{2ia^3\cos^5(c+dx)(a+ia\tan(c+dx))^5}{1155d}-\frac{2ia^2\cos^7(c+dx)(a+ia\tan}{231d}
\end{aligned}$$

Mathematica [A] time = 1.68, size = 73, normalized size = 0.54

$$\frac{a^8(-i(55\sin(c+dx)+63\sin(3(c+dx)))+440\cos(c+dx)+168\cos(3(c+dx)))(\sin(8(c+dx))-i\cos(8(c+dx}{4620d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^11*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (a^8*(440*Cos[c + d*x] + 168*Cos[3*(c + d*x)] - I*(55*Sin[c + d*x] + 63*Sin
[3*(c + d*x)]))*((-I)*Cos[8*(c + d*x)] + Sin[8*(c + d*x)]))/(4620*d)
```

fricas [A] time = 0.57, size = 62, normalized size = 0.46

$$\frac{-105i\,a^8e^{(11i\,dx+11i\,c)} - 385i\,a^8e^{(9i\,dx+9i\,c)} - 495i\,a^8e^{(7i\,dx+7i\,c)} - 231i\,a^8e^{(5i\,dx+5i\,c)}}{9240\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^11*(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/9240*(-105*I*a^8*e^(11*I*d*x + 11*I*c) - 385*I*a^8*e^(9*I*d*x + 9*I*c) -
495*I*a^8*e^(7*I*d*x + 7*I*c) - 231*I*a^8*e^(5*I*d*x + 5*I*c))/d
```

giac [B] time = 16.29, size = 2863, normalized size = 21.05

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^11*(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/4844421120*(82027951005*a^8*e^(28*I*d*x + 14*I*c)*log(I*e^(I*d*x + I*c) +
 1) + 1148391314070*a^8*e^(26*I*d*x + 12*I*c)*log(I*e^(I*d*x + I*c) + 1) +
7464543541455*a^8*e^(24*I*d*x + 10*I*c)*log(I*e^(I*d*x + I*c) + 1) + 298581
74165820*a^8*e^(22*I*d*x + 8*I*c)*log(I*e^(I*d*x + I*c) + 1) + 821099789560
05*a^8*e^(20*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*c) + 1) + 164219957912010*a^
8*e^(18*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 246329936868015*a^8*e^(
16*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) + 1) + 246329936868015*a^8*e^(12*I*
d*x - 2*I*c)*log(I*e^(I*d*x + I*c) + 1) + 164219957912010*a^8*e^(10*I*d*x -
 4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 82109978956005*a^8*e^(8*I*d*x - 6*I*c)
*log(I*e^(I*d*x + I*c) + 1) + 29858174165820*a^8*e^(6*I*d*x - 8*I*c)*log(I*
e^(I*d*x + I*c) + 1) + 7464543541455*a^8*e^(4*I*d*x - 10*I*c)*log(I*e^(I*d*
x + I*c) + 1) + 1148391314070*a^8*e^(2*I*d*x - 12*I*c)*log(I*e^(I*d*x + I*c
) + 1) + 281519927849160*a^8*e^(14*I*d*x)*log(I*e^(I*d*x + I*c) + 1) + 8202
7951005*a^8*e^(-14*I*c)*log(I*e^(I*d*x + I*c) + 1) + 82004266575*a^8*e^(28*
I*d*x + 14*I*c)*log(I*e^(I*d*x + I*c) - 1) + 1148059732050*a^8*e^(26*I*d*x
+ 12*I*c)*log(I*e^(I*d*x + I*c) - 1) + 7462388258325*a^8*e^(24*I*d*x + 10*I
*c)*log(I*e^(I*d*x + I*c) - 1) + 29849553033300*a^8*e^(22*I*d*x + 8*I*c)*lo
g(I*e^(I*d*x + I*c) - 1) + 82086270841575*a^8*e^(20*I*d*x + 6*I*c)*log(I*e^
(I*d*x + I*c) - 1) + 164172541683150*a^8*e^(18*I*d*x + 4*I*c)*log(I*e^(I*d*
x + I*c) - 1) + 246258812524725*a^8*e^(16*I*d*x + 2*I*c)*log(I*e^(I*d*x + I
*c) - 1) + 246258812524725*a^8*e^(12*I*d*x - 2*I*c)*log(I*e^(I*d*x + I*c) -
 1) + 164172541683150*a^8*e^(10*I*d*x - 4*I*c)*log(I*e^(I*d*x + I*c) - 1) +
 82086270841575*a^8*e^(8*I*d*x - 6*I*c)*log(I*e^(I*d*x + I*c) - 1) + 298495
53033300*a^8*e^(6*I*d*x - 8*I*c)*log(I*e^(I*d*x + I*c) - 1) + 7462388258325
*a^8*e^(4*I*d*x - 10*I*c)*log(I*e^(I*d*x + I*c) - 1) + 1148059732050*a^8*e^
(2*I*d*x - 12*I*c)*log(I*e^(I*d*x + I*c) - 1) + 281438642885400*a^8*e^(14*I
*d*x)*log(I*e^(I*d*x + I*c) - 1) + 82004266575*a^8*e^(-14*I*c)*log(I*e^(I*d
*x + I*c) - 1) - 82027951005*a^8*e^(28*I*d*x + 14*I*c)*log(-I*e^(I*d*x + I*
c) + 1) - 1148391314070*a^8*e^(26*I*d*x + 12*I*c)*log(-I*e^(I*d*x + I*c) +
1) - 7464543541455*a^8*e^(24*I*d*x + 10*I*c)*log(-I*e^(I*d*x + I*c) + 1) -
29858174165820*a^8*e^(22*I*d*x + 8*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 82109
978956005*a^8*e^(20*I*d*x + 6*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 1642199579
12010*a^8*e^(18*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 24632993686801
5*a^8*e^(16*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 246329936868015*a^
8*e^(12*I*d*x - 2*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 164219957912010*a^8*e^
```

```
(10*I*d*x - 4*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 82109978956005*a^8*e^(8*I*
d*x - 6*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 29858174165820*a^8*e^(6*I*d*x -
8*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 7464543541455*a^8*e^(4*I*d*x - 10*I*c)
*log(-I*e^(I*d*x + I*c) + 1) - 1148391314070*a^8*e^(2*I*d*x - 12*I*c)*log(-
I*e^(I*d*x + I*c) + 1) - 281519927849160*a^8*e^(14*I*d*x)*log(-I*e^(I*d*x +
 I*c) + 1) - 82027951005*a^8*e^(-14*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 8200
4266575*a^8*e^(28*I*d*x + 14*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 1148059732O
50*a^8*e^(26*I*d*x + 12*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 7462388258325*a^
8*e^(24*I*d*x + 10*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 29849553033300*a^8*e^
(22*I*d*x + 8*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 82086270841575*a^8*e^(20*I
*d*x + 6*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 164172541683150*a^8*e^(18*I*d*x
 + 4*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 246258812524725*a^8*e^(16*I*d*x + 2
*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 246258812524725*a^8*e^(12*I*d*x - 2*I*c
)*log(-I*e^(I*d*x + I*c) - 1) - 164172541683150*a^8*e^(10*I*d*x - 4*I*c)*lo
g(-I*e^(I*d*x + I*c) - 1) - 82086270841575*a^8*e^(8*I*d*x - 6*I*c)*log(-I*e
^(I*d*x + I*c) - 1) - 29849553033300*a^8*e^(6*I*d*x - 8*I*c)*log(-I*e^(I*d*
x + I*c) - 1) - 7462388258325*a^8*e^(4*I*d*x - 10*I*c)*log(-I*e^(I*d*x + I*
c) - 1) - 1148059732050*a^8*e^(2*I*d*x - 12*I*c)*log(-I*e^(I*d*x + I*c) - 1
) - 281438642885400*a^8*e^(14*I*d*x)*log(-I*e^(I*d*x + I*c) - 1) - 82004266
575*a^8*e^(-14*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 23684430*a^8*e^(28*I*d*x
+ 14*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 331582020*a^8*e^(26*I*d*x + 12*I*c)
*log(I*e^(I*d*x) + e^(-I*c)) - 2155283130*a^8*e^(24*I*d*x + 10*I*c)*log(I*e
^(I*d*x) + e^(-I*c)) - 8621132520*a^8*e^(22*I*d*x + 8*I*c)*log(I*e^(I*d*x)
+ e^(-I*c)) - 23708114430*a^8*e^(20*I*d*x + 6*I*c)*log(I*e^(I*d*x) + e^(-I*
c)) - 47416228860*a^8*e^(18*I*d*x + 4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 71
124343290*a^8*e^(16*I*d*x + 2*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 7112434329
0*a^8*e^(12*I*d*x - 2*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 47416228860*a^8*e^
(10*I*d*x - 4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 23708114430*a^8*e^(8*I*d*x
 - 6*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 8621132520*a^8*e^(6*I*d*x - 8*I*c)*
log(I*e^(I*d*x) + e^(-I*c)) - 2155283130*a^8*e^(4*I*d*x - 10*I*c)*log(I*e^(
I*d*x) + e^(-I*c)) - 331582020*a^8*e^(2*I*d*x - 12*I*c)*log(I*e^(I*d*x) + e
^(-I*c)) - 81284963760*a^8*e^(14*I*d*x)*log(I*e^(I*d*x) + e^(-I*c)) - 23684
430*a^8*e^(-14*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 23684430*a^8*e^(28*I*d*x
+ 14*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 331582020*a^8*e^(26*I*d*x + 12*I*c
)*log(-I*e^(I*d*x) + e^(-I*c)) + 2155283130*a^8*e^(24*I*d*x + 10*I*c)*log(-
I*e^(I*d*x) + e^(-I*c)) + 8621132520*a^8*e^(22*I*d*x + 8*I*c)*log(-I*e^(I*d
*x) + e^(-I*c)) + 23708114430*a^8*e^(20*I*d*x + 6*I*c)*log(-I*e^(I*d*x) + e
^(-I*c)) + 47416228860*a^8*e^(18*I*d*x + 4*I*c)*log(-I*e^(I*d*x) + e^(-I*c)
) + 71124343290*a^8*e^(16*I*d*x + 2*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 711
24343290*a^8*e^(12*I*d*x - 2*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 4741622886
0*a^8*e^(10*I*d*x - 4*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 23708114430*a^8*e
^(8*I*d*x - 6*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 8621132520*a^8*e^(6*I*d*x
 - 8*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 2155283130*a^8*e^(4*I*d*x - 10*I*c
)*log(-I*e^(I*d*x) + e^(-I*c)) + 331582020*a^8*e^(2*I*d*x - 12*I*c)*log(-I*
e^(I*d*x) + e^(-I*c)) + 81284963760*a^8*e^(14*I*d*x)*log(-I*e^(I*d*x) + e^(
-I*c)) + 23684430*a^8*e^(-14*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) - 55050240*I
*a^8*e^(39*I*d*x + 25*I*c) - 972554240*I*a^8*e^(37*I*d*x + 23*I*c) - 809500
6720*I*a^8*e^(35*I*d*x + 21*I*c) - 42161143808*I*a^8*e^(33*I*d*x + 19*I*c)
- 153891110912*I*a^8*e^(31*I*d*x + 17*I*c) - 417750581248*I*a^8*e^(29*I*d*x
 + 15*I*c) - 873287647232*I*a^8*e^(27*I*d*x + 13*I*c) - 1435886419968*I*a^8
*e^(25*I*d*x + 11*I*c) - 1879877615616*I*a^8*e^(23*I*d*x + 9*I*c) - 1970745
114624*I*a^8*e^(21*I*d*x + 7*I*c) - 1654208331776*I*a^8*e^(19*I*d*x + 5*I*c
) - 1105350098944*I*a^8*e^(17*I*d*x + 3*I*c) - 580728651776*I*a^8*e^(15*I*d
*x + I*c) - 234836983808*I*a^8*e^(13*I*d*x - I*c) - 70581747712*I*a^8*e^(11
*I*d*x - 3*I*c) - 14856224768*I*a^8*e^(9*I*d*x - 5*I*c) - 1955069952*I*a^8*
e^(7*I*d*x - 7*I*c) - 121110528*I*a^8*e^(5*I*d*x - 9*I*c))/(d*e^(28*I*d*x +
 14*I*c) + 14*d*e^(26*I*d*x + 12*I*c) + 91*d*e^(24*I*d*x + 10*I*c) + 364*d*
e^(22*I*d*x + 8*I*c) + 1001*d*e^(20*I*d*x + 6*I*c) + 2002*d*e^(18*I*d*x + 4
*I*c) + 3003*d*e^(16*I*d*x + 2*I*c) + 3003*d*e^(12*I*d*x - 2*I*c) + 2002*d*
```

```
e^(10*I*d*x - 4*I*c) + 1001*d*e^(8*I*d*x - 6*I*c) + 364*d*e^(6*I*d*x - 8*I*
c) + 91*d*e^(4*I*d*x - 10*I*c) + 14*d*e^(2*I*d*x - 12*I*c) + 3432*d*e^(14*I
*d*x) + d*e^(-14*I*c))
```

maple [B] time = 0.74, size = 567, normalized size = 4.17

$$a^{8}\left(-\frac{\left(\sin^{7}(dx+c)\right)\left(\cos^{4}(dx+c)\right)}{11}-\frac{7\left(\sin^{5}(dx+c)\right)\left(\cos^{4}(dx+c)\right)}{99}-\frac{5\left(\sin^{3}(dx+c)\right)\left(\cos^{4}(dx+c)\right)}{99}-\frac{\sin(dx+c)\left(\cos^{4}(dx+c)\right)}{33}+\frac{\left(2+\cos^{2}(dx+c)\right)\sin}{99}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^11*(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/d*(a^8*(-1/11*sin(d*x+c)^7*cos(d*x+c)^4-7/99*sin(d*x+c)^5*cos(d*x+c)^4-5/
99*sin(d*x+c)^3*cos(d*x+c)^4-1/33*sin(d*x+c)*cos(d*x+c)^4+1/99*(2+cos(d*x+c
)^2)*sin(d*x+c))-8*I*a^8*(-1/11*sin(d*x+c)^6*cos(d*x+c)^5-2/33*sin(d*x+c)^4
*cos(d*x+c)^5-8/231*sin(d*x+c)^2*cos(d*x+c)^5-16/1155*cos(d*x+c)^5)-28*a^8*
(-1/11*sin(d*x+c)^5*cos(d*x+c)^6-5/99*sin(d*x+c)^3*cos(d*x+c)^6-5/231*sin(d
*x+c)*cos(d*x+c)^6+1/231*(8/3+cos(d*x+c)^4+4/3*cos(d*x+c)^2)*sin(d*x+c))+56
*I*a^8*(-1/11*sin(d*x+c)^4*cos(d*x+c)^7-4/99*sin(d*x+c)^2*cos(d*x+c)^7-8/69
3*cos(d*x+c)^7)+70*a^8*(-1/11*sin(d*x+c)^3*cos(d*x+c)^8-1/33*sin(d*x+c)*cos
(d*x+c)^8+1/231*(16/5+cos(d*x+c)^6+6/5*cos(d*x+c)^4+8/5*cos(d*x+c)^2)*sin(d
*x+c))-56*I*a^8*(-1/11*sin(d*x+c)^2*cos(d*x+c)^9-2/99*cos(d*x+c)^9)-28*a^8*
(-1/11*sin(d*x+c)*cos(d*x+c)^10+1/99*(128/35+cos(d*x+c)^8+8/7*cos(d*x+c)^6+
48/35*cos(d*x+c)^4+64/35*cos(d*x+c)^2)*sin(d*x+c))-8/11*I*a^8*cos(d*x+c)^11
+1/11*a^8*(256/63+cos(d*x+c)^10+10/9*cos(d*x+c)^8+80/63*cos(d*x+c)^6+32/21*
cos(d*x+c)^4+128/63*cos(d*x+c)^2)*sin(d*x+c))
```

maxima [B] time = 0.38, size = 355, normalized size = 2.61

$$-\frac{2520i\,a^{8}\cos\left(dx+c\right)^{11}+24i\left(105\,\cos\left(dx+c\right)^{11}-385\,\cos\left(dx+c\right)^{9}+495\,\cos\left(dx+c\right)^{7}-231\,\cos\left(dx+c\right)^{5}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^11*(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] -1/3465*(2520*I*a^8*cos(d*x + c)^11 + 24*I*(105*cos(d*x + c)^11 - 385*cos(d
*x + c)^9 + 495*cos(d*x + c)^7 - 231*cos(d*x + c)^5)*a^8 + 280*I*(63*cos(d*
x + c)^11 - 154*cos(d*x + c)^9 + 99*cos(d*x + c)^7)*a^8 + 1960*I*(9*cos(d*x
 + c)^11 - 11*cos(d*x + c)^9)*a^8 + 28*(315*sin(d*x + c)^11 - 1540*sin(d*x
+ c)^9 + 2970*sin(d*x + c)^7 - 2772*sin(d*x + c)^5 + 1155*sin(d*x + c)^3)*a
^8 + 210*(105*sin(d*x + c)^11 - 385*sin(d*x + c)^9 + 495*sin(d*x + c)^7 - 2
31*sin(d*x + c)^5)*a^8 + 140*(63*sin(d*x + c)^11 - 154*sin(d*x + c)^9 + 99*
sin(d*x + c)^7)*a^8 + 5*(63*sin(d*x + c)^11 - 385*sin(d*x + c)^9 + 990*sin(
d*x + c)^7 - 1386*sin(d*x + c)^5 + 1155*sin(d*x + c)^3 - 693*sin(d*x + c))*
a^8 + 35*(9*sin(d*x + c)^11 - 11*sin(d*x + c)^9)*a^8)/d
```

mupad [B] time = 3.80, size = 65, normalized size = 0.48

$$-\frac{a^{8}\left(\frac{\mathrm{e}^{c\,5\mathrm{i}+d\,x\,5\mathrm{i}}\,1\mathrm{i}}{40}+\frac{\mathrm{e}^{c\,7\mathrm{i}+d\,x\,7\mathrm{i}}\,3\mathrm{i}}{56}+\frac{\mathrm{e}^{c\,9\mathrm{i}+d\,x\,9\mathrm{i}}\,1\mathrm{i}}{24}+\frac{\mathrm{e}^{c\,11\mathrm{i}+d\,x\,11\mathrm{i}}\,1\mathrm{i}}{88}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^11*(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] -(a^8*((exp(c*5i + d*x*5i)*1i)/40 + (exp(c*7i + d*x*7i)*3i)/56 + (exp(c*9i
+ d*x*9i)*1i)/24 + (exp(c*11i + d*x*11i)*1i)/88))/d
```

sympy [A] time = 1.18, size = 163, normalized size = 1.20

$$\begin{cases} \frac{-53760ia^8d^3e^{11ic}e^{11idx}-197120ia^8d^3e^{9ic}e^{9idx}-253440ia^8d^3e^{7ic}e^{7idx}-118272ia^8d^3e^{5ic}e^{5idx}}{4730880d^4} & \text{for } 4730880d^4 \neq 0 \\ x\left(\frac{a^8e^{11ic}}{8}+\frac{3a^8e^{9ic}}{8}+\frac{3a^8e^{7ic}}{8}+\frac{a^8e^{5ic}}{8}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**11*(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Piecewise(((-53760*I*a**8*d**3*exp(11*I*c)*exp(11*I*d*x) - 197120*I*a**8*d*
*3*exp(9*I*c)*exp(9*I*d*x) - 253440*I*a**8*d**3*exp(7*I*c)*exp(7*I*d*x) - 1
18272*I*a**8*d**3*exp(5*I*c)*exp(5*I*d*x))/(4730880*d**4), Ne(4730880*d**4,
 0)), (x*(a**8*exp(11*I*c)/8 + 3*a**8*exp(9*I*c)/8 + 3*a**8*exp(7*I*c)/8 +
a**8*exp(5*I*c)/8), True))
```

3.97 $\int \cos^{13}(c+dx)(a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=211

$$-\frac{20ia^3\cos^7(c+dx)(a+ia\tan(c+dx))^5}{3003d}-\frac{20ia^2\cos^9(c+dx)(a+ia\tan(c+dx))^6}{1287d}-\frac{8i\cos^5(c+dx)\left(a^2+ia^2\tan\right.}{3003d}$$

```
[Out] -20/3003*I*a^3*cos(d*x+c)^7*(a+I*a*tan(d*x+c))^5/d-20/1287*I*a^2*cos(d*x+c)
^9*(a+I*a*tan(d*x+c))^6/d-5/143*I*a*cos(d*x+c)^11*(a+I*a*tan(d*x+c))^7/d-1/
13*I*cos(d*x+c)^13*(a+I*a*tan(d*x+c))^8/d-8/9009*I*a^2*cos(d*x+c)^3*(a^2+I*
a^2*tan(d*x+c))^3/d-8/3003*I*cos(d*x+c)^5*(a^2+I*a^2*tan(d*x+c))^4/d
```

Rubi [A] time = 0.25, antiderivative size = 211, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3497, 3488}

$$-\frac{20ia^2\cos^9(c+dx)(a+ia\tan(c+dx))^6}{1287d}-\frac{20ia^3\cos^7(c+dx)(a+ia\tan(c+dx))^5}{3003d}-\frac{8i\cos^5(c+dx)\left(a^2+ia^2\tan\right.}{3003d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^13*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (((-20*I)/3003)*a^3*Cos[c + d*x]^7*(a + I*a*Tan[c + d*x])^5)/d - (((20*I)/1
287)*a^2*Cos[c + d*x]^9*(a + I*a*Tan[c + d*x])^6)/d - (((5*I)/143)*a*Cos[c
+ d*x]^11*(a + I*a*Tan[c + d*x])^7)/d - ((I/13)*Cos[c + d*x]^13*(a + I*a*Ta
n[c + d*x])^8)/d - (((8*I)/9009)*a^2*Cos[c + d*x]^3*(a^2 + I*a^2*Tan[c + d*
x])^3)/d - (((8*I)/3003)*Cos[c + d*x]^5*(a^2 + I*a^2*Tan[c + d*x])^4)/d
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rubi steps

$$\int \cos^{13}(c+dx)(a+ia\tan(c+dx))^8\,dx = -\frac{i\cos^{13}(c+dx)(a+ia\tan(c+dx))^8}{13d} + \frac{1}{13}(5a)\int \cos^{11}(c+dx)(a+ia$$
$$= -\frac{5ia\cos^{11}(c+dx)(a+ia\tan(c+dx))^7}{143d} - \frac{i\cos^{13}(c+dx)(a+ia\tan(c+$$
$$= -\frac{20ia^2\cos^{9}(c+dx)(a+ia\tan(c+dx))^6}{1287d} - \frac{5ia\cos^{11}(c+dx)(a+ia\tan$$
$$= -\frac{20ia^3\cos^{7}(c+dx)(a+ia\tan(c+dx))^5}{3003d} - \frac{20ia^2\cos^{9}(c+dx)(a+ia\tan$$
$$= -\frac{20ia^3\cos^{7}(c+dx)(a+ia\tan(c+dx))^5}{3003d} - \frac{20ia^2\cos^{9}(c+dx)(a+ia\tan$$
$$= -\frac{8ia^5\cos^{3}(c+dx)(a+ia\tan(c+dx))^3}{9009d} - \frac{20ia^3\cos^{7}(c+dx)(a+ia\tan$$

Mathematica [A] time = 1.65, size = 111, normalized size = 0.53

$$\frac{a^8(-1430i\sin(c+dx) - 2457i\sin(3(c+dx)) - 1155i\sin(5(c+dx)) + 11440\cos(c+dx) + 6552\cos(3(c+dx)) +}{144144d(\cos(dx)+i\sin(dx))^8}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^13*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (a^8*(11440*Cos[c + d*x] + 6552*Cos[3*(c + d*x)] + 1848*Cos[5*(c + d*x)] -
(1430*I)*Sin[c + d*x] - (2457*I)*Sin[3*(c + d*x)] - (1155*I)*Sin[5*(c + d*x
)])*((-I)*Cos[8*(c + 2*d*x)] + Sin[8*(c + 2*d*x)]))/(144144*d*(Cos[d*x] + I
*Sin[d*x])^8)
```

fricas [A] time = 0.57, size = 90, normalized size = 0.43

$$\frac{-693i\,a^8e^{(13i\,dx+13i\,c)} - 4095i\,a^8e^{(11i\,dx+11i\,c)} - 10010i\,a^8e^{(9i\,dx+9i\,c)} - 12870i\,a^8e^{(7i\,dx+7i\,c)} - 9009i\,a^8e^{(5i\,dx+5i\,c)} - 3003}{288288\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^13*(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/288288*(-693*I*a^8*e^(13*I*d*x + 13*I*c) - 4095*I*a^8*e^(11*I*d*x + 11*I*
c) - 10010*I*a^8*e^(9*I*d*x + 9*I*c) - 12870*I*a^8*e^(7*I*d*x + 7*I*c) - 90
09*I*a^8*e^(5*I*d*x + 5*I*c) - 3003*I*a^8*e^(3*I*d*x + 3*I*c))/d
```

giac [B] time = 18.20, size = 2891, normalized size = 13.70

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^13*(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/755729694720*(9725263833285*a^8*e^(28*I*d*x + 14*I*c)*log(I*e^(I*d*x + I*
c) + 1) + 136153693665990*a^8*e^(26*I*d*x + 12*I*c)*log(I*e^(I*d*x + I*c) +
 1) + 884999008828935*a^8*e^(24*I*d*x + 10*I*c)*log(I*e^(I*d*x + I*c) + 1)
+ 3539996035315740*a^8*e^(22*I*d*x + 8*I*c)*log(I*e^(I*d*x + I*c) + 1) + 97
34989097118285*a^8*e^(20*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*c) + 1) + 194699
78194236570*a^8*e^(18*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 292049672
91354855*a^8*e^(16*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) + 1) + 292049672913
54855*a^8*e^(12*I*d*x - 2*I*c)*log(I*e^(I*d*x + I*c) + 1) + 194699781942365
70*a^8*e^(10*I*d*x - 4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 9734989097118285*a
```

^8*e^(8*I*d*x - 6*I*c)*log(I*e^(I*d*x + I*c) + 1) + 3539996035315740*a^8*e^
(6*I*d*x - 8*I*c)*log(I*e^(I*d*x + I*c) + 1) + 884999008828935*a^8*e^(4*I*d
*x - 10*I*c)*log(I*e^(I*d*x + I*c) + 1) + 136153693665990*a^8*e^(2*I*d*x -
12*I*c)*log(I*e^(I*d*x + I*c) + 1) + 33377105475834120*a^8*e^(14*I*d*x)*log
(I*e^(I*d*x + I*c) + 1) + 9725263833285*a^8*e^(-14*I*c)*log(I*e^(I*d*x + I*
c) + 1) + 9720402036345*a^8*e^(28*I*d*x + 14*I*c)*log(I*e^(I*d*x + I*c) - 1
) + 136085628508830*a^8*e^(26*I*d*x + 12*I*c)*log(I*e^(I*d*x + I*c) - 1) +
884556585307395*a^8*e^(24*I*d*x + 10*I*c)*log(I*e^(I*d*x + I*c) - 1) + 3538
226341229580*a^8*e^(22*I*d*x + 8*I*c)*log(I*e^(I*d*x + I*c) - 1) + 97301224
38381345*a^8*e^(20*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*c) - 1) + 194602448767
62690*a^8*e^(18*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) - 1) + 291903673151440
35*a^8*e^(16*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) - 1) + 29190367315144035*
a^8*e^(12*I*d*x - 2*I*c)*log(I*e^(I*d*x + I*c) - 1) + 19460244876762690*a^8
*e^(10*I*d*x - 4*I*c)*log(I*e^(I*d*x + I*c) - 1) + 9730122438381345*a^8*e^(
8*I*d*x - 6*I*c)*log(I*e^(I*d*x + I*c) - 1) + 3538226341229580*a^8*e^(6*I*d
*x - 8*I*c)*log(I*e^(I*d*x + I*c) - 1) + 884556585307395*a^8*e^(4*I*d*x - 1
0*I*c)*log(I*e^(I*d*x + I*c) - 1) + 136085628508830*a^8*e^(2*I*d*x - 12*I*c
)*log(I*e^(I*d*x + I*c) - 1) + 33360419788736040*a^8*e^(14*I*d*x)*log(I*e^(
I*d*x + I*c) - 1) + 9720402036345*a^8*e^(-14*I*c)*log(I*e^(I*d*x + I*c) - 1
) - 9725263833285*a^8*e^(28*I*d*x + 14*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 1
36153693665990*a^8*e^(26*I*d*x + 12*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 8849
99008828935*a^8*e^(24*I*d*x + 10*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 3539996
035315740*a^8*e^(22*I*d*x + 8*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 9734989097
118285*a^8*e^(20*I*d*x + 6*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 1946997819423
6570*a^8*e^(18*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 292049672913548
55*a^8*e^(16*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 29204967291354855
*a^8*e^(12*I*d*x - 2*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 19469978194236570*a
^8*e^(10*I*d*x - 4*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 9734989097118285*a^8*
e^(8*I*d*x - 6*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 3539996035315740*a^8*e^(6
*I*d*x - 8*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 884999008828935*a^8*e^(4*I*d*
x - 10*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 136153693665990*a^8*e^(2*I*d*x -
12*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 33377105475834120*a^8*e^(14*I*d*x)*lo
g(-I*e^(I*d*x + I*c) + 1) - 9725263833285*a^8*e^(-14*I*c)*log(-I*e^(I*d*x +
I*c) + 1) - 9720402036345*a^8*e^(28*I*d*x + 14*I*c)*log(-I*e^(I*d*x + I*c)
- 1) - 136085628508830*a^8*e^(26*I*d*x + 12*I*c)*log(-I*e^(I*d*x + I*c) -
1) - 884556585307395*a^8*e^(24*I*d*x + 10*I*c)*log(-I*e^(I*d*x + I*c) - 1)
- 3538226341229580*a^8*e^(22*I*d*x + 8*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 9
730122438381345*a^8*e^(20*I*d*x + 6*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 1946
0244876762690*a^8*e^(18*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 291903
67315144035*a^8*e^(16*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 29190367
315144035*a^8*e^(12*I*d*x - 2*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 1946024487
6762690*a^8*e^(10*I*d*x - 4*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 973012243838
1345*a^8*e^(8*I*d*x - 6*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 3538226341229580
*a^8*e^(6*I*d*x - 8*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 884556585307395*a^8*
e^(4*I*d*x - 10*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 136085628508830*a^8*e^(2
*I*d*x - 12*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 33360419788736040*a^8*e^(14*
I*d*x)*log(-I*e^(I*d*x + I*c) - 1) - 9720402036345*a^8*e^(-14*I*c)*log(-I*e
^(I*d*x + I*c) - 1) - 4861796940*a^8*e^(28*I*d*x + 14*I*c)*log(I*e^(I*d*x)
+ e^(-I*c)) - 68065157160*a^8*e^(26*I*d*x + 12*I*c)*log(I*e^(I*d*x) + e^(-I
*c)) - 442423521540*a^8*e^(24*I*d*x + 10*I*c)*log(I*e^(I*d*x) + e^(-I*c)) -
1769694086160*a^8*e^(22*I*d*x + 8*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 48666
58736940*a^8*e^(20*I*d*x + 6*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 97333174738
80*a^8*e^(18*I*d*x + 4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 14599976210820*a^
8*e^(16*I*d*x + 2*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 14599976210820*a^8*e^(
12*I*d*x - 2*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 9733317473880*a^8*e^(10*I*d
*x - 4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 4866658736940*a^8*e^(8*I*d*x - 6*
I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 1769694086160*a^8*e^(6*I*d*x - 8*I*c)*lo
g(I*e^(I*d*x) + e^(-I*c)) - 442423521540*a^8*e^(4*I*d*x - 10*I*c)*log(I*e^(
I*d*x) + e^(-I*c)) - 68065157160*a^8*e^(2*I*d*x - 12*I*c)*log(I*e^(I*d*x) +

```
 e^(-I*c)) - 16685687098080*a^8*e^(14*I*d*x)*log(I*e^(I*d*x) + e^(-I*c)) -
4861796940*a^8*e^(-14*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 4861796940*a^8*e^(
28*I*d*x + 14*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 68065157160*a^8*e^(26*I*d
*x + 12*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 442423521540*a^8*e^(24*I*d*x +
10*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 1769694086160*a^8*e^(22*I*d*x + 8*I*
c)*log(-I*e^(I*d*x) + e^(-I*c)) + 4866658736940*a^8*e^(20*I*d*x + 6*I*c)*lo
g(-I*e^(I*d*x) + e^(-I*c)) + 9733317473880*a^8*e^(18*I*d*x + 4*I*c)*log(-I*
e^(I*d*x) + e^(-I*c)) + 14599976210820*a^8*e^(16*I*d*x + 2*I*c)*log(-I*e^(I
*d*x) + e^(-I*c)) + 14599976210820*a^8*e^(12*I*d*x - 2*I*c)*log(-I*e^(I*d*x
) + e^(-I*c)) + 9733317473880*a^8*e^(10*I*d*x - 4*I*c)*log(-I*e^(I*d*x) + e
^(-I*c)) + 4866658736940*a^8*e^(8*I*d*x - 6*I*c)*log(-I*e^(I*d*x) + e^(-I*c
)) + 1769694086160*a^8*e^(6*I*d*x - 8*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 4
42423521540*a^8*e^(4*I*d*x - 10*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 6806515
7160*a^8*e^(2*I*d*x - 12*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 16685687098080
*a^8*e^(14*I*d*x)*log(-I*e^(I*d*x) + e^(-I*c)) + 4861796940*a^8*e^(-14*I*c)
*log(-I*e^(I*d*x) + e^(-I*c)) - 1816657920*I*a^8*e^(41*I*d*x + 27*I*c) - 36
168007680*I*a^8*e^(39*I*d*x + 25*I*c) - 341843640320*I*a^8*e^(37*I*d*x + 23
*I*c) - 2039236526080*I*a^8*e^(35*I*d*x + 21*I*c) - 8609784135680*I*a^8*e^(
33*I*d*x + 19*I*c) - 27342720204800*I*a^8*e^(31*I*d*x + 17*I*c) - 677532663
80800*I*a^8*e^(29*I*d*x + 15*I*c) - 134089539584000*I*a^8*e^(27*I*d*x + 13*
I*c) - 215146797465600*I*a^8*e^(25*I*d*x + 11*I*c) - 282406740295680*I*a^8*
e^(23*I*d*x + 9*I*c) - 304579309731840*I*a^8*e^(21*I*d*x + 7*I*c) - 2699476
96578560*I*a^8*e^(19*I*d*x + 5*I*c) - 195820823511040*I*a^8*e^(17*I*d*x + 3
*I*c) - 115246062632960*I*a^8*e^(15*I*d*x + I*c) - 54220889784320*I*a^8*e^(
13*I*d*x - I*c) - 19924737064960*I*a^8*e^(11*I*d*x - 3*I*c) - 5513153085440
*I*a^8*e^(9*I*d*x - 5*I*c) - 1080738447360*I*a^8*e^(7*I*d*x - 7*I*c) - 1338
27133440*I*a^8*e^(5*I*d*x - 9*I*c) - 7872184320*I*a^8*e^(3*I*d*x - 11*I*c))
/(d*e^(28*I*d*x + 14*I*c) + 14*d*e^(26*I*d*x + 12*I*c) + 91*d*e^(24*I*d*x +
 10*I*c) + 364*d*e^(22*I*d*x + 8*I*c) + 1001*d*e^(20*I*d*x + 6*I*c) + 2002*
d*e^(18*I*d*x + 4*I*c) + 3003*d*e^(16*I*d*x + 2*I*c) + 3003*d*e^(12*I*d*x -
 2*I*c) + 2002*d*e^(10*I*d*x - 4*I*c) + 1001*d*e^(8*I*d*x - 6*I*c) + 364*d*
e^(6*I*d*x - 8*I*c) + 91*d*e^(4*I*d*x - 10*I*c) + 14*d*e^(2*I*d*x - 12*I*c)
 + 3432*d*e^(14*I*d*x) + d*e^(-14*I*c))
```

maple [B] time = 0.73, size = 617, normalized size = 2.92

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^13*(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/d*(a^8*(-1/13*sin(d*x+c)^7*cos(d*x+c)^6-7/143*sin(d*x+c)^5*cos(d*x+c)^6-3
5/1287*sin(d*x+c)^3*cos(d*x+c)^6-5/429*sin(d*x+c)*cos(d*x+c)^6+1/429*(8/3+c
os(d*x+c)^4+4/3*cos(d*x+c)^2)*sin(d*x+c))-8*I*a^8*(-1/13*sin(d*x+c)^6*cos(d
*x+c)^7-6/143*sin(d*x+c)^4*cos(d*x+c)^7-8/429*sin(d*x+c)^2*cos(d*x+c)^7-16/
3003*cos(d*x+c)^7)-28*a^8*(-1/13*sin(d*x+c)^5*cos(d*x+c)^8-5/143*sin(d*x+c)
^3*cos(d*x+c)^8-5/429*sin(d*x+c)*cos(d*x+c)^8+5/3003*(16/5+cos(d*x+c)^6+6/5
*cos(d*x+c)^4+8/5*cos(d*x+c)^2)*sin(d*x+c))+56*I*a^8*(-1/13*sin(d*x+c)^4*co
s(d*x+c)^9-4/143*sin(d*x+c)^2*cos(d*x+c)^9-8/1287*cos(d*x+c)^9)+70*a^8*(-1/
13*sin(d*x+c)^3*cos(d*x+c)^10-3/143*sin(d*x+c)*cos(d*x+c)^10+1/429*(128/35+
cos(d*x+c)^8+8/7*cos(d*x+c)^6+48/35*cos(d*x+c)^4+64/35*cos(d*x+c)^2)*sin(d*
x+c))-56*I*a^8*(-1/13*sin(d*x+c)^2*cos(d*x+c)^11-2/143*cos(d*x+c)^11)-28*a^
8*(-1/13*cos(d*x+c)^12*sin(d*x+c)+1/143*(256/63+cos(d*x+c)^10+10/9*cos(d*x+
c)^8+80/63*cos(d*x+c)^6+32/21*cos(d*x+c)^4+128/63*cos(d*x+c)^2)*sin(d*x+c))
-8/13*I*a^8*cos(d*x+c)^13+1/13*a^8*(1024/231+cos(d*x+c)^12+12/11*cos(d*x+c)
^10+40/33*cos(d*x+c)^8+320/231*cos(d*x+c)^6+128/77*cos(d*x+c)^4+512/231*cos
(d*x+c)^2)*sin(d*x+c))
```

maxima [B] time = 0.42, size = 405, normalized size = 1.92

$$-\frac{5544i\,a^8\cos\left(dx+c\right)^{13}+24i\left(231\,\cos\left(dx+c\right)^{13}-819\,\cos\left(dx+c\right)^{11}+1001\,\cos\left(dx+c\right)^{9}-429\,\cos\left(dx+c\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^13*(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] -1/9009*(5544*I*a^8*cos(d*x + c)^13 + 24*I*(231*cos(d*x + c)^13 - 819*cos(d
*x + c)^11 + 1001*cos(d*x + c)^9 - 429*cos(d*x + c)^7)*a^8 + 392*I*(99*cos(
d*x + c)^13 - 234*cos(d*x + c)^11 + 143*cos(d*x + c)^9)*a^8 + 3528*I*(11*co
s(d*x + c)^13 - 13*cos(d*x + c)^11)*a^8 - 42*(1155*sin(d*x + c)^13 - 5460*s
in(d*x + c)^11 + 10010*sin(d*x + c)^9 - 8580*sin(d*x + c)^7 + 3003*sin(d*x
+ c)^5)*a^8 - 28*(693*sin(d*x + c)^13 - 4095*sin(d*x + c)^11 + 10010*sin(d*
x + c)^9 - 12870*sin(d*x + c)^7 + 9009*sin(d*x + c)^5 - 3003*sin(d*x + c)^3
)*a^8 - 84*(231*sin(d*x + c)^13 - 819*sin(d*x + c)^11 + 1001*sin(d*x + c)^9
 - 429*sin(d*x + c)^7)*a^8 - 3*(231*sin(d*x + c)^13 - 1638*sin(d*x + c)^11
+ 5005*sin(d*x + c)^9 - 8580*sin(d*x + c)^7 + 9009*sin(d*x + c)^5 - 6006*si
n(d*x + c)^3 + 3003*sin(d*x + c))*a^8 - 7*(99*sin(d*x + c)^13 - 234*sin(d*x
 + c)^11 + 143*sin(d*x + c)^9)*a^8)/d
```

mupad [B] time = 4.08, size = 93, normalized size = 0.44

$$-\frac{a^8\left(\frac{\mathrm{e}^{c\,3\mathrm{i}+d\,x\,3\mathrm{i}}\,1\mathrm{i}}{96}+\frac{\mathrm{e}^{c\,5\mathrm{i}+d\,x\,5\mathrm{i}}\,1\mathrm{i}}{32}+\frac{\mathrm{e}^{c\,7\mathrm{i}+d\,x\,7\mathrm{i}}\,5\mathrm{i}}{112}+\frac{\mathrm{e}^{c\,9\mathrm{i}+d\,x\,9\mathrm{i}}\,5\mathrm{i}}{144}+\frac{\mathrm{e}^{c\,11\mathrm{i}+d\,x\,11\mathrm{i}}\,5\mathrm{i}}{352}+\frac{\mathrm{e}^{c\,13\mathrm{i}+d\,x\,13\mathrm{i}}\,1\mathrm{i}}{416}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^13*(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] -(a^8*((exp(c*3i + d*x*3i)*1i)/96 + (exp(c*5i + d*x*5i)*1i)/32 + (exp(c*7i
+ d*x*7i)*5i)/112 + (exp(c*9i + d*x*9i)*5i)/144 + (exp(c*11i + d*x*11i)*5i)
/352 + (exp(c*13i + d*x*13i)*1i)/416))/d
```

sympy [A] time = 1.40, size = 241, normalized size = 1.14

$$\begin{cases} \frac{-17439916032ia^8d^5e^{13ic}e^{13idx}-103054049280ia^8d^5e^{11ic}e^{11idx}-251909898240ia^8d^5e^{9ic}e^{9idx}-323884154880ia^8d^5e^{7ic}e^{7idx}-226718908416ia^8d^5e^{5ic}}{7255005069312d^6} \\ x\left(\frac{a^8e^{13ic}}{32}+\frac{5a^8e^{11ic}}{32}+\frac{5a^8e^{9ic}}{16}+\frac{5a^8e^{7ic}}{16}+\frac{5a^8e^{5ic}}{32}+\frac{a^8e^{3ic}}{32}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**13*(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Piecewise(((-17439916032*I*a**8*d**5*exp(13*I*c)*exp(13*I*d*x) - 1030540492
80*I*a**8*d**5*exp(11*I*c)*exp(11*I*d*x) - 251909898240*I*a**8*d**5*exp(9*I
*c)*exp(9*I*d*x) - 323884154880*I*a**8*d**5*exp(7*I*c)*exp(7*I*d*x) - 22671
8908416*I*a**8*d**5*exp(5*I*c)*exp(5*I*d*x) - 75572969472*I*a**8*d**5*exp(3
*I*c)*exp(3*I*d*x))/(7255005069312*d**6), Ne(7255005069312*d**6, 0)), (x*(a
**8*exp(13*I*c)/32 + 5*a**8*exp(11*I*c)/32 + 5*a**8*exp(9*I*c)/16 + 5*a**8*
exp(7*I*c)/16 + 5*a**8*exp(5*I*c)/32 + a**8*exp(3*I*c)/32), True))
```

3.98 $\int \cos^{15}(c+dx)(a+ia\tan(c+dx))^8\,dx$

Optimal. Leaf size=212

$$-\frac{a^8\sin^7(c+dx)}{1287d}+\frac{7a^8\sin^5(c+dx)}{2145d}-\frac{7a^8\sin^3(c+dx)}{1287d}+\frac{7a^8\sin(c+dx)}{1287d}-\frac{2i\cos^9(c+dx)\left(a^8+ia^8\tan(c+dx)\right)}{1287d}-\frac{2i}{}$$

```
[Out] 7/1287*a^8*sin(d*x+c)/d-7/1287*a^8*sin(d*x+c)^3/d+7/2145*a^8*sin(d*x+c)^5/d
-1/1287*a^8*sin(d*x+c)^7/d-2/195*I*a^3*cos(d*x+c)^13*(a+I*a*tan(d*x+c))^5/d
-2/15*I*a*cos(d*x+c)^15*(a+I*a*tan(d*x+c))^7/d-2/715*I*a^2*cos(d*x+c)^11*(a
^2+I*a^2*tan(d*x+c))^3/d-2/1287*I*cos(d*x+c)^9*(a^8+I*a^8*tan(d*x+c))/d
```

Rubi [A] time = 0.20, antiderivative size = 212, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3496, 2633}

$$-\frac{a^8\sin^7(c+dx)}{1287d}+\frac{7a^8\sin^5(c+dx)}{2145d}-\frac{7a^8\sin^3(c+dx)}{1287d}+\frac{7a^8\sin(c+dx)}{1287d}-\frac{2ia^3\cos^{13}(c+dx)(a+ia\tan(c+dx))^5}{195d}-$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^15*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (7*a^8*Sin[c + d*x])/(1287*d) - (7*a^8*Sin[c + d*x]^3)/(1287*d) + (7*a^8*Si
n[c + d*x]^5)/(2145*d) - (a^8*Sin[c + d*x]^7)/(1287*d) - (((2*I)/195)*a^3*C
os[c + d*x]^13*(a + I*a*Tan[c + d*x])^5)/d - (((2*I)/15)*a*Cos[c + d*x]^15*
(a + I*a*Tan[c + d*x])^7)/d - (((2*I)/715)*a^2*Cos[c + d*x]^11*(a^2 + I*a^2
*Tan[c + d*x])^3)/d - (((2*I)/1287)*Cos[c + d*x]^9*(a^8 + I*a^8*Tan[c + d*x
]))/d
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rubi steps

$$\int \cos^{15}(c+dx)(a+ia\tan(c+dx))^8\,dx = -\frac{2ia\cos^{15}(c+dx)(a+ia\tan(c+dx))^7}{15d} + \frac{1}{15}a^2\int \cos^{13}(c+dx)(a$$
$$= -\frac{2ia^3\cos^{13}(c+dx)(a+ia\tan(c+dx))^5}{195d} - \frac{2ia\cos^{15}(c+dx)(a+ia}{15d}$$
$$= -\frac{2ia^5\cos^{11}(c+dx)(a+ia\tan(c+dx))^3}{715d} - \frac{2ia^3\cos^{13}(c+dx)(a+ia}{195d}$$
$$= -\frac{2ia^5\cos^{11}(c+dx)(a+ia\tan(c+dx))^3}{715d} - \frac{2ia^3\cos^{13}(c+dx)(a+ia}{195d}$$
$$= -\frac{2ia^5\cos^{11}(c+dx)(a+ia\tan(c+dx))^3}{715d} - \frac{2ia^3\cos^{13}(c+dx)(a+ia}{195d}$$
$$= \frac{7a^8\sin(c+dx)}{1287d} - \frac{7a^8\sin^3(c+dx)}{1287d} + \frac{7a^8\sin^5(c+dx)}{2145d} - \frac{a^8\sin^7(c+}{1287d}$$

Mathematica [A] time = 4.18, size = 133, normalized size = 0.63

$$\frac{a^8(-3575i\sin(c+dx) - 7371i\sin(3(c+dx)) - 5775i\sin(5(c+dx)) - 3003i\sin(7(c+dx)) + 28600\cos(c+dx}{411840d(\cos(dx}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^15*(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (a^8*(28600*Cos[c + d*x] + 19656*Cos[3*(c + d*x)] + 9240*Cos[5*(c + d*x)] +
 3432*Cos[7*(c + d*x)] - (3575*I)*Sin[c + d*x] - (7371*I)*Sin[3*(c + d*x)]
- (5775*I)*Sin[5*(c + d*x)] - (3003*I)*Sin[7*(c + d*x)])*((-I)*Cos[8*(c + 2
*d*x)] + Sin[8*(c + 2*d*x)]))/(411840*d*(Cos[d*x] + I*Sin[d*x])^8)
```

fricas [A] time = 0.55, size = 118, normalized size = 0.56

$$\frac{-429i\,a^8e^{(15i\,dx+15i\,c)} - 3465i\,a^8e^{(13i\,dx+13i\,c)} - 12285i\,a^8e^{(11i\,dx+11i\,c)} - 25025i\,a^8e^{(9i\,dx+9i\,c)} - 32175i\,a^8e^{(7i\,dx+7i\,c)}}{823680\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^15*(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/823680*(-429*I*a^8*e^(15*I*d*x + 15*I*c) - 3465*I*a^8*e^(13*I*d*x + 13*I*
c) - 12285*I*a^8*e^(11*I*d*x + 11*I*c) - 25025*I*a^8*e^(9*I*d*x + 9*I*c) -
32175*I*a^8*e^(7*I*d*x + 7*I*c) - 27027*I*a^8*e^(5*I*d*x + 5*I*c) - 15015*I
*a^8*e^(3*I*d*x + 3*I*c) - 6435*I*a^8*e^(I*d*x + I*c))/d
```

giac [B] time = 18.21, size = 2919, normalized size = 13.77

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^15*(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/863691079680*(5682101344920*a^8*e^(28*I*d*x + 14*I*c)*log(I*e^(I*d*x + I*
c) + 1) + 79549418828880*a^8*e^(26*I*d*x + 12*I*c)*log(I*e^(I*d*x + I*c) +
1) + 517071222387720*a^8*e^(24*I*d*x + 10*I*c)*log(I*e^(I*d*x + I*c) + 1) +
 2068284889550880*a^8*e^(22*I*d*x + 8*I*c)*log(I*e^(I*d*x + I*c) + 1) + 568
7783446264920*a^8*e^(20*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*c) + 1) + 1137556
6892529840*a^8*e^(18*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 1706335033
8794760*a^8*e^(16*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) + 1) + 1706335033879
4760*a^8*e^(12*I*d*x - 2*I*c)*log(I*e^(I*d*x + I*c) + 1) + 1137556689252984
```

0*a^8*e^(10*I*d*x - 4*I*c)*log(I*e^(I*d*x + I*c) + 1) + 5687783446264920*a^
8*e^(8*I*d*x - 6*I*c)*log(I*e^(I*d*x + I*c) + 1) + 2068284889550880*a^8*e^(
6*I*d*x - 8*I*c)*log(I*e^(I*d*x + I*c) + 1) + 517071222387720*a^8*e^(4*I*d*
x - 10*I*c)*log(I*e^(I*d*x + I*c) + 1) + 79549418828880*a^8*e^(2*I*d*x - 12
*I*c)*log(I*e^(I*d*x + I*c) + 1) + 1950971815765440*a^8*e^(14*I*d*x)*log(I
*e^(I*d*x + I*c) + 1) + 5682101344920*a^8*e^(-14*I*c)*log(I*e^(I*d*x + I*c)
 + 1) + 5674116082635*a^8*e^(28*I*d*x + 14*I*c)*log(I*e^(I*d*x + I*c) - 1)
+ 79437625156890*a^8*e^(26*I*d*x + 12*I*c)*log(I*e^(I*d*x + I*c) - 1) + 516
344563519785*a^8*e^(24*I*d*x + 10*I*c)*log(I*e^(I*d*x + I*c) - 1) + 2065378
254079140*a^8*e^(22*I*d*x + 8*I*c)*log(I*e^(I*d*x + I*c) - 1) + 56797901987
17635*a^8*e^(20*I*d*x + 6*I*c)*log(I*e^(I*d*x + I*c) - 1) + 113595803974352
70*a^8*e^(18*I*d*x + 4*I*c)*log(I*e^(I*d*x + I*c) - 1) + 17039370596152905*
a^8*e^(16*I*d*x + 2*I*c)*log(I*e^(I*d*x + I*c) - 1) + 17039370596152905*a^8
*e^(12*I*d*x - 2*I*c)*log(I*e^(I*d*x + I*c) - 1) + 11359580397435270*a^8*e^
(10*I*d*x - 4*I*c)*log(I*e^(I*d*x + I*c) - 1) + 5679790198717635*a^8*e^(8*I
*d*x - 6*I*c)*log(I*e^(I*d*x + I*c) - 1) + 2065378254079140*a^8*e^(6*I*d*x
- 8*I*c)*log(I*e^(I*d*x + I*c) - 1) + 516344563519785*a^8*e^(4*I*d*x - 10*I
*c)*log(I*e^(I*d*x + I*c) - 1) + 79437625156890*a^8*e^(2*I*d*x - 12*I*c)*lo
g(I*e^(I*d*x + I*c) - 1) + 1947356639560332 0*a^8*e^(14*I*d*x)*log(I*e^(I*d*
x + I*c) - 1) + 5674116082635*a^8*e^(-14*I*c)*log(I*e^(I*d*x + I*c) - 1) -
5682101344920*a^8*e^(28*I*d*x + 14*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 79549
418828880*a^8*e^(26*I*d*x + 12*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 517071222
387720*a^8*e^(24*I*d*x + 10*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 206828488955
0880*a^8*e^(22*I*d*x + 8*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 568778344626492
0*a^8*e^(20*I*d*x + 6*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 11375566892529840*
a^8*e^(18*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 17063350338794760*a^
8*e^(16*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 17063350338794760*a^8*
e^(12*I*d*x - 2*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 11375566892529840*a^8*e^
(10*I*d*x - 4*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 5687783446264920*a^8*e^(8*
I*d*x - 6*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 2068284889550880*a^8*e^(6*I*d*
x - 8*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 517071222387720*a^8*e^(4*I*d*x - 1
0*I*c)*log(-I*e^(I*d*x + I*c) + 1) - 79549418828880*a^8*e^(2*I*d*x - 12*I*c
)*log(-I*e^(I*d*x + I*c) + 1) - 1950971815765440*a^8*e^(14*I*d*x)*log(-I*e
^(I*d*x + I*c) + 1) - 5682101344920*a^8*e^(-14*I*c)*log(-I*e^(I*d*x + I*c)
+ 1) - 5674116082635*a^8*e^(28*I*d*x + 14*I*c)*log(-I*e^(I*d*x + I*c) - 1)
- 79437625156890*a^8*e^(26*I*d*x + 12*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 51
6344563519785*a^8*e^(24*I*d*x + 10*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 20653
78254079140*a^8*e^(22*I*d*x + 8*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 56797901
98717635*a^8*e^(20*I*d*x + 6*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 11359580397
435270*a^8*e^(18*I*d*x + 4*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 1703937059615
2905*a^8*e^(16*I*d*x + 2*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 170393705961529
05*a^8*e^(12*I*d*x - 2*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 11359580397435270
*a^8*e^(10*I*d*x - 4*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 5679790198717635*a^
8*e^(8*I*d*x - 6*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 2065378254079140*a^8*e^
(6*I*d*x - 8*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 516344563519785*a^8*e^(4*I*
d*x - 10*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 79437625156890*a^8*e^(2*I*d*x -
 12*I*c)*log(-I*e^(I*d*x + I*c) - 1) - 19473566395603320*a^8*e^(14*I*d*x)*l
og(-I*e^(I*d*x + I*c) - 1) - 5674116082635*a^8*e^(-14*I*c)*log(-I*e^(I*d*x
+ I*c) - 1) - 7985262285*a^8*e^(28*I*d*x + 14*I*c)*log(I*e^(I*d*x) + e^(-I*
c)) - 111793671990*a^8*e^(26*I*d*x + 12*I*c)*log(I*e^(I*d*x) + e^(-I*c)) -
726658867935*a^8*e^(24*I*d*x + 10*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 290663
5471740*a^8*e^(22*I*d*x + 8*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 799324754728
5*a^8*e^(20*I*d*x + 6*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 15986495094570*a^8
*e^(18*I*d*x + 4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 23979742641855*a^8*e^(1
6*I*d*x + 2*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 23979742641855*a^8*e^(12*I*d
*x - 2*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 15986495094570*a^8*e^(10*I*d*x -
4*I*c)*log(I*e^(I*d*x) + e^(-I*c)) - 7993247547285*a^8*e^(8*I*d*x - 6*I*c)*
log(I*e^(I*d*x) + e^(-I*c)) - 2906635471740*a^8*e^(6*I*d*x - 8*I*c)*log(I*e
^(I*d*x) + e^(-I*c)) - 726658867935*a^8*e^(4*I*d*x - 10*I*c)*log(I*e^(I*d*x

```
) + e^(-I*c)) - 111793671990*a^8*e^(2*I*d*x - 12*I*c)*log(I*e^(I*d*x) + e^(
-I*c)) - 27405420162120*a^8*e^(14*I*d*x)*log(I*e^(I*d*x) + e^(-I*c)) - 7985
262285*a^8*e^(-14*I*c)*log(I*e^(I*d*x) + e^(-I*c)) + 7985262285*a^8*e^(28*I
*d*x + 14*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 111793671990*a^8*e^(26*I*d*x
+ 12*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 726658867935*a^8*e^(24*I*d*x + 10*
I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 2906635471740*a^8*e^(22*I*d*x + 8*I*c)*
log(-I*e^(I*d*x) + e^(-I*c)) + 7993247547285*a^8*e^(20*I*d*x + 6*I*c)*log(-
I*e^(I*d*x) + e^(-I*c)) + 15986495094570*a^8*e^(18*I*d*x + 4*I*c)*log(-I*e^
(I*d*x) + e^(-I*c)) + 23979742641855*a^8*e^(16*I*d*x + 2*I*c)*log(-I*e^(I*d
*x) + e^(-I*c)) + 23979742641855*a^8*e^(12*I*d*x - 2*I*c)*log(-I*e^(I*d*x)
+ e^(-I*c)) + 15986495094570*a^8*e^(10*I*d*x - 4*I*c)*log(-I*e^(I*d*x) + e^
(-I*c)) + 7993247547285*a^8*e^(8*I*d*x - 6*I*c)*log(-I*e^(I*d*x) + e^(-I*c)
) + 2906635471740*a^8*e^(6*I*d*x - 8*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 72
6658867935*a^8*e^(4*I*d*x - 10*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 11179367
1990*a^8*e^(2*I*d*x - 12*I*c)*log(-I*e^(I*d*x) + e^(-I*c)) + 27405420162120
*a^8*e^(14*I*d*x)*log(-I*e^(I*d*x) + e^(-I*c)) + 7985262285*a^8*e^(-14*I*c)
*log(-I*e^(I*d*x) + e^(-I*c)) - 449839104*I*a^8*e^(43*I*d*x + 29*I*c) - 993
1063296*I*a^8*e^(41*I*d*x + 27*I*c) - 104683536384*I*a^8*e^(39*I*d*x + 25*I
*c) - 700958375936*I*a^8*e^(37*I*d*x + 23*I*c) - 3346162253824*I*a^8*e^(35*
I*d*x + 21*I*c) - 12115053117440*I*a^8*e^(33*I*d*x + 19*I*c) - 345536410419
20*I*a^8*e^(31*I*d*x + 17*I*c) - 79597529989120*I*a^8*e^(29*I*d*x + 15*I*c)
 - 150652615393280*I*a^8*e^(27*I*d*x + 13*I*c) - 237078702981120*I*a^8*e^(2
5*I*d*x + 11*I*c) - 312733543170048*I*a^8*e^(23*I*d*x + 9*I*c) - 3475582872
45312*I*a^8*e^(21*I*d*x + 7*I*c) - 326158241497088*I*a^8*e^(19*I*d*x + 5*I*
c) - 258238371069952*I*a^8*e^(17*I*d*x + 3*I*c) - 171721273376768*I*a^8*e^(
15*I*d*x + I*c) - 95003913224192*I*a^8*e^(13*I*d*x - I*c) - 43034893877248*
I*a^8*e^(11*I*d*x - 3*I*c) - 15562783588352*I*a^8*e^(9*I*d*x - 5*I*c) - 431
9355076608*I*a^8*e^(7*I*d*x - 7*I*c) - 862791401472*I*a^8*e^(5*I*d*x - 9*I*
c) - 110210580480*I*a^8*e^(3*I*d*x - 11*I*c) - 6747586560*I*a^8*e^(I*d*x -
13*I*c))/(d*e^(28*I*d*x + 14*I*c) + 14*d*e^(26*I*d*x + 12*I*c) + 91*d*e^(24
*I*d*x + 10*I*c) + 364*d*e^(22*I*d*x + 8*I*c) + 1001*d*e^(20*I*d*x + 6*I*c)
 + 2002*d*e^(18*I*d*x + 4*I*c) + 3003*d*e^(16*I*d*x + 2*I*c) + 3003*d*e^(12
*I*d*x - 2*I*c) + 2002*d*e^(10*I*d*x - 4*I*c) + 1001*d*e^(8*I*d*x - 6*I*c)
+ 364*d*e^(6*I*d*x - 8*I*c) + 91*d*e^(4*I*d*x - 10*I*c) + 14*d*e^(2*I*d*x -
 12*I*c) + 3432*d*e^(14*I*d*x) + d*e^(-14*I*c))
```

maple [B] time = 0.75, size = 667, normalized size = 3.15

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^15*(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/d*(a^8*(-1/15*sin(d*x+c)^7*cos(d*x+c)^8-7/195*sin(d*x+c)^5*cos(d*x+c)^8-7
/429*sin(d*x+c)^3*cos(d*x+c)^8-7/1287*sin(d*x+c)*cos(d*x+c)^8+1/1287*(16/5+
cos(d*x+c)^6+6/5*cos(d*x+c)^4+8/5*cos(d*x+c)^2)*sin(d*x+c))-8*I*a^8*(-1/15*
sin(d*x+c)^6*cos(d*x+c)^9-2/65*sin(d*x+c)^4*cos(d*x+c)^9-8/715*sin(d*x+c)^2
*cos(d*x+c)^9-16/6435*cos(d*x+c)^9)-28*a^8*(-1/15*sin(d*x+c)^5*cos(d*x+c)^1
0-1/39*sin(d*x+c)^3*cos(d*x+c)^10-1/143*sin(d*x+c)*cos(d*x+c)^10+1/1287*(12
8/35+cos(d*x+c)^8+8/7*cos(d*x+c)^6+48/35*cos(d*x+c)^4+64/35*cos(d*x+c)^2)*s
in(d*x+c))+56*I*a^8*(-1/15*sin(d*x+c)^4*cos(d*x+c)^11-4/195*sin(d*x+c)^2*co
s(d*x+c)^11-8/2145*cos(d*x+c)^11)+70*a^8*(-1/15*sin(d*x+c)^3*cos(d*x+c)^12-
1/65*cos(d*x+c)^12*sin(d*x+c)+1/715*(256/63+cos(d*x+c)^10+10/9*cos(d*x+c)^8
+80/63*cos(d*x+c)^6+32/21*cos(d*x+c)^4+128/63*cos(d*x+c)^2)*sin(d*x+c))-56*
I*a^8*(-1/15*sin(d*x+c)^2*cos(d*x+c)^13-2/195*cos(d*x+c)^13)-28*a^8*(-1/15*
cos(d*x+c)^14*sin(d*x+c)+1/195*(1024/231+cos(d*x+c)^12+12/11*cos(d*x+c)^10+
40/33*cos(d*x+c)^8+320/231*cos(d*x+c)^6+128/77*cos(d*x+c)^4+512/231*cos(d*x
+c)^2)*sin(d*x+c))-8/15*I*a^8*cos(d*x+c)^15+1/15*a^8*(2048/429+cos(d*x+c)^1
4+14/13*cos(d*x+c)^12+168/143*cos(d*x+c)^10+560/429*cos(d*x+c)^8+640/429*co
s(d*x+c)^6+256/143*cos(d*x+c)^4+1024/429*cos(d*x+c)^2)*sin(d*x+c))
```

maxima [B] time = 0.51, size = 453, normalized size = 2.14

$$-\frac{3432i\,a^8\cos(dx+c)^{15}+8i\left(429\cos(dx+c)^{15}-1485\cos(dx+c)^{13}+1755\cos(dx+c)^{11}-715\cos(dx+c)^{9}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^15*(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] -1/6435*(3432*I*a^8*cos(d*x + c)^15 + 8*I*(429*cos(d*x + c)^15 - 1485*cos(d
*x + c)^13 + 1755*cos(d*x + c)^11 - 715*cos(d*x + c)^9)*a^8 + 168*I*(143*co
s(d*x + c)^15 - 330*cos(d*x + c)^13 + 195*cos(d*x + c)^11)*a^8 + 1848*I*(13
*cos(d*x + c)^15 - 15*cos(d*x + c)^13)*a^8 + 4*(3003*sin(d*x + c)^15 - 1386
0*sin(d*x + c)^13 + 24570*sin(d*x + c)^11 - 20020*sin(d*x + c)^9 + 6435*sin
(d*x + c)^7)*a^8 + 10*(3003*sin(d*x + c)^15 - 17325*sin(d*x + c)^13 + 40950
*sin(d*x + c)^11 - 50050*sin(d*x + c)^9 + 32175*sin(d*x + c)^7 - 9009*sin(d
*x + c)^5)*a^8 + 4*(3003*sin(d*x + c)^15 - 20790*sin(d*x + c)^13 + 61425*si
n(d*x + c)^11 - 100100*sin(d*x + c)^9 + 96525*sin(d*x + c)^7 - 54054*sin(d*
x + c)^5 + 15015*sin(d*x + c)^3)*a^8 + (429*sin(d*x + c)^15 - 1485*sin(d*x
+ c)^13 + 1755*sin(d*x + c)^11 - 715*sin(d*x + c)^9)*a^8 + (429*sin(d*x + c
)^15 - 3465*sin(d*x + c)^13 + 12285*sin(d*x + c)^11 - 25025*sin(d*x + c)^9
+ 32175*sin(d*x + c)^7 - 27027*sin(d*x + c)^5 + 15015*sin(d*x + c)^3 - 6435
*sin(d*x + c))*a^8)/d
```

mupad [B] time = 5.26, size = 222, normalized size = 1.05

$$\frac{2\,a^8\left(2\sin\left(\frac{c}{4}+\frac{d\,x}{4}\right)^2-1\right)\left(-\frac{44779\sin(c+d\,x)^2}{32}+\frac{\sin(c+d\,x)\,32175\mathrm{i}}{128}-\frac{26075\sin(2\,c+2\,d\,x)^2}{16}-\frac{\sin(2\,c+2\,d\,x)\,3575\mathrm{i}}{8}+\frac{114583\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right.}{64}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^15*(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] (2*a^8*(2*sin(c/4 + (d*x)/4)^2 - 1)*((sin(c + d*x)*32175i)/128 - (sin(2*c +
 2*d*x)*3575i)/8 + (sin(3*c + 3*d*x)*84227i)/128 - sin(4*c + 4*d*x)*754i +
(sin(5*c + 5*d*x)*111527i)/128 - (sin(6*c + 6*d*x)*7187i)/8 + (sin(7*c + 7*
d*x)*121427i)/128 - (26075*sin(2*c + 2*d*x)^2)/16 + (114583*sin(c/2 + (d*x)
/2)^2)/64 - (57925*sin(3*c + 3*d*x)^2)/32 + (116585*sin((3*c)/2 + (3*d*x)/2
)^2)/64 + (119315*sin((5*c)/2 + (5*d*x)/2)^2)/64 + (122285*sin((7*c)/2 + (7
*d*x)/2)^2)/64 - (44779*sin(c + d*x)^2)/32 - 952))/(6435*d*(sin((15*c)/2 +
(15*d*x)/2) - sin((15*c)/4 + (15*d*x)/4)^2*2i + 1i))
```

sympy [A] time = 1.63, size = 314, normalized size = 1.48

$$\begin{cases}\frac{-10867748850798428160ia^8d^7e^{15ic}e^{15idx}-8777797148721807360 0ia^8d^7e^{13ic}e^{13idx}-311212808000136806400ia^8d^7e^{11ic}e^{11idx}-6339520162965749760\ldots}{2\ldots} \\ x\left(\frac{a^8e^{15ic}}{128}+\frac{7a^8e^{13ic}}{128}+\frac{21a^8e^{11ic}}{128}+\frac{35a^8e^{9ic}}{128}+\frac{35a^8e^{7ic}}{128}+\frac{21a^8e^{5ic}}{128}+\frac{7a^8e^{3ic}}{128}+\frac{a^8e^{ic}}{128}\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**15*(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Piecewise(((-10867748850798428160*I*a**8*d**7*exp(15*I*c)*exp(15*I*d*x) - 8
7777971487218073600*I*a**8*d**7*exp(13*I*c)*exp(13*I*d*x) - 311212808000136
806400*I*a**8*d**7*exp(11*I*c)*exp(11*I*d*x) - 633952016296574976000*I*a**8
*d**7*exp(9*I*c)*exp(9*I*d*x) - 815081163809882112000*I*a**8*d**7*exp(7*I*c
```

```
)*exp(7*I*d*x) - 684668177600300974080*I*a**8*d**7*exp(5*I*c)*exp(5*I*d*x)
- 380371209777944985600*I*a**8*d**7*exp(3*I*c)*exp(3*I*d*x) - 1630162327619
76422400*I*a**8*d**7*exp(I*c)*exp(I*d*x))/(20866077793532982067200*d**8), N
e(20866077793532982067200*d**8, 0)), (x*(a**8*exp(15*I*c)/128 + 7*a**8*exp(
13*I*c)/128 + 21*a**8*exp(11*I*c)/128 + 35*a**8*exp(9*I*c)/128 + 35*a**8*ex
p(7*I*c)/128 + 21*a**8*exp(5*I*c)/128 + 7*a**8*exp(3*I*c)/128 + a**8*exp(I*
c)/128), True))
```

3.99 $\int \frac{\sec^{10}(c+dx)}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=107

$$-\frac{i(a-ia\tan(c+dx))^8}{8a^9d}+\frac{6i(a-ia\tan(c+dx))^7}{7a^8d}-\frac{2i(a-ia\tan(c+dx))^6}{a^7d}+\frac{8i(a-ia\tan(c+dx))^5}{5a^6d}$$

```
[Out] 8/5*I*(a-I*a*tan(d*x+c))^5/a^6/d-2*I*(a-I*a*tan(d*x+c))^6/a^7/d+6/7*I*(a-I*
a*tan(d*x+c))^7/a^8/d-1/8*I*(a-I*a*tan(d*x+c))^8/a^9/d
```

Rubi [A] time = 0.07, antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {3487, 43}

$$-\frac{i(a-ia\tan(c+dx))^8}{8a^9d}+\frac{6i(a-ia\tan(c+dx))^7}{7a^8d}-\frac{2i(a-ia\tan(c+dx))^6}{a^7d}+\frac{8i(a-ia\tan(c+dx))^5}{5a^6d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^10/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (((8*I)/5)*(a - I*a*Tan[c + d*x])^5)/(a^6*d) - ((2*I)*(a - I*a*Tan[c + d*x]
)^6)/(a^7*d) + (((6*I)/7)*(a - I*a*Tan[c + d*x])^7)/(a^8*d) - ((I/8)*(a - I
*a*Tan[c + d*x])^8)/(a^9*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^{10}(c+dx)}{a+ia\tan(c+dx)}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^4(a+x)^3\,dx,x,ia\tan(c+dx)\right)}{a^9d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(8a^3(a-x)^4-12a^2(a-x)^5+6a(a-x)^6-(a-x)^7\right)dx,x,ia\tan(c+dx)\right)}{a^9d}\\ &= \frac{8i(a-ia\tan(c+dx))^5}{5a^6d}-\frac{2i(a-ia\tan(c+dx))^6}{a^7d}+\frac{6i(a-ia\tan(c+dx))^7}{7a^8d}-\frac{i(a-ia\,\text{ta}}{8}\end{aligned}$$

Mathematica [A] time = 0.49, size = 71, normalized size = 0.66

$$\frac{\sec(c)\sec^8(c+dx)(56\sin(c+2dx)+28\sin(3c+4dx)+8\sin(5c+6dx)+\sin(7c+8dx)-35\sin(c)-35i\cos(c)}{280ad}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^10/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (Sec[c]*Sec[c + d*x]^8*((-35*I)*Cos[c] - 35*Sin[c] + 56*Sin[c + 2*d*x] + 28
*Sin[3*c + 4*d*x] + 8*Sin[5*c + 6*d*x] + Sin[7*c + 8*d*x]))/(280*a*d)
```

fricas [A] time = 0.63, size = 146, normalized size = 1.36

$$\frac{1792i\,e^{(6i\,dx+6i\,c)} + 896i\,e^{(4i\,dx+4i\,c)} + 256i\,e^{(2i\,dx+2i\,c)} + 32i}{35\left(ade^{(16i\,dx+16i\,c)} + 8\,ade^{(14i\,dx+14i\,c)} + 28\,ade^{(12i\,dx+12i\,c)} + 56\,ade^{(10i\,dx+10i\,c)} + 70\,ade^{(8i\,dx+8i\,c)} + 56\,ade^{(6i\,dx+6i\,c)}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/35*(1792*I*e^(6*I*d*x + 6*I*c) + 896*I*e^(4*I*d*x + 4*I*c) + 256*I*e^(2*I
*d*x + 2*I*c) + 32*I)/(a*d*e^(16*I*d*x + 16*I*c) + 8*a*d*e^(14*I*d*x + 14*I
*c) + 28*a*d*e^(12*I*d*x + 12*I*c) + 56*a*d*e^(10*I*d*x + 10*I*c) + 70*a*d*
e^(8*I*d*x + 8*I*c) + 56*a*d*e^(6*I*d*x + 6*I*c) + 28*a*d*e^(4*I*d*x + 4*I*
c) + 8*a*d*e^(2*I*d*x + 2*I*c) + a*d)
```

giac [A] time = 0.69, size = 87, normalized size = 0.81

$$-\frac{35i\,\tan\left(dx+c\right)^{8} - 40\,\tan\left(dx+c\right)^{7} + 140i\,\tan\left(dx+c\right)^{6} - 168\,\tan\left(dx+c\right)^{5} + 210i\,\tan\left(dx+c\right)^{4} - 280\,\tan}{280\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/280*(35*I*tan(d*x + c)^8 - 40*tan(d*x + c)^7 + 140*I*tan(d*x + c)^6 - 16
8*tan(d*x + c)^5 + 210*I*tan(d*x + c)^4 - 280*tan(d*x + c)^3 + 140*I*tan(d*
x + c)^2 - 280*tan(d*x + c))/(a*d)
```

maple [A] time = 0.39, size = 87, normalized size = 0.81

$$\frac{\tan\left(dx+c\right) - \frac{i\left(\tan^{8}\left(dx+c\right)\right)}{8} + \frac{\left(\tan^{7}\left(dx+c\right)\right)}{7} - \frac{i\left(\tan^{6}\left(dx+c\right)\right)}{2} + \frac{3\left(\tan^{5}\left(dx+c\right)\right)}{5} - \frac{3i\left(\tan^{4}\left(dx+c\right)\right)}{4} + \tan^{3}\left(dx+c\right) - \frac{i\left(\tan^{2}\left(dx+c\right)\right)}{2}}{da}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^10/(a+I*a*tan(d*x+c)),x)
```

```
[Out] 1/d/a*(tan(d*x+c)-1/8*I*tan(d*x+c)^8+1/7*tan(d*x+c)^7-1/2*I*tan(d*x+c)^6+3/
5*tan(d*x+c)^5-3/4*I*tan(d*x+c)^4+tan(d*x+c)^3-1/2*I*tan(d*x+c)^2)
```

maxima [A] time = 0.42, size = 87, normalized size = 0.81

$$\frac{-105i\,\tan\left(dx+c\right)^{8} + 120\,\tan\left(dx+c\right)^{7} - 420i\,\tan\left(dx+c\right)^{6} + 504\,\tan\left(dx+c\right)^{5} - 630i\,\tan\left(dx+c\right)^{4} + 840\,t}{840\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/840*(-105*I*tan(d*x + c)^8 + 120*tan(d*x + c)^7 - 420*I*tan(d*x + c)^6 +
504*tan(d*x + c)^5 - 630*I*tan(d*x + c)^4 + 840*tan(d*x + c)^3 - 420*I*tan(
d*x + c)^2 + 840*tan(d*x + c))/(a*d)
```

mupad [B] time = 3.53, size = 92, normalized size = 0.86

$$\frac{\cos\left(c+d\,x\right)^{8}\,35\mathrm{i} + 128\,\sin\left(c+d\,x\right)\,\cos\left(c+d\,x\right)^{7} + 64\,\sin\left(c+d\,x\right)\,\cos\left(c+d\,x\right)^{5} + 48\,\sin\left(c+d\,x\right)\,\cos\left(c+\right.}{280\,a\,d\cos\left(c+d\,x\right)^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^10*(a + a*tan(c + d*x)*1i)),x)
```

```
[Out] (40*cos(c + d*x)*sin(c + d*x) + 48*cos(c + d*x)^3*sin(c + d*x) + 64*cos(c +
 d*x)^5*sin(c + d*x) + 128*cos(c + d*x)^7*sin(c + d*x) + cos(c + d*x)^8*35i
 - 35i)/(280*a*d*cos(c + d*x)^8)
```

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

$$-\frac{i\int \frac{\sec^{10}(c+dx)}{\tan(c+dx)-i}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**10/(a+I*a*tan(d*x+c)),x)
```

```
[Out] -I*Integral(sec(c + d*x)**10/(tan(c + d*x) - I), x)/a
```

3.100 $\int \frac{\sec^8(c+dx)}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=80

$$\frac{i(a-ia\tan(c+dx))^6}{6a^7d}-\frac{4i(a-ia\tan(c+dx))^5}{5a^6d}+\frac{i(a-ia\tan(c+dx))^4}{a^5d}$$

```
[Out] I*(a-I*a*tan(d*x+c))^4/a^5/d-4/5*I*(a-I*a*tan(d*x+c))^5/a^6/d+1/6*I*(a-I*a*
tan(d*x+c))^6/a^7/d
```

Rubi [A] time = 0.06, antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{i(a-ia\tan(c+dx))^6}{6a^7d}-\frac{4i(a-ia\tan(c+dx))^5}{5a^6d}+\frac{i(a-ia\tan(c+dx))^4}{a^5d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^8/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (I*(a - I*a*Tan[c + d*x])^4)/(a^5*d) - (((4*I)/5)*(a - I*a*Tan[c + d*x])^5)
/(a^6*d) + ((I/6)*(a - I*a*Tan[c + d*x])^6)/(a^7*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sec^8(c+dx)}{a+ia\tan(c+dx)}\,dx &= -\frac{i\,\mathrm{Subst}\left(\int (a-x)^3(a+x)^2\,dx, x, ia\tan(c+dx)\right)}{a^7d}\\
&= -\frac{i\,\mathrm{Subst}\left(\int \left(4a^2(a-x)^3-4a(a-x)^4+(a-x)^5\right)dx, x, ia\tan(c+dx)\right)}{a^7d}\\
&= \frac{i(a-ia\tan(c+dx))^4}{a^5d}-\frac{4i(a-ia\tan(c+dx))^5}{5a^6d}+\frac{i(a-ia\tan(c+dx))^6}{6a^7d}
\end{aligned}$$

Mathematica [A] time = 0.37, size = 60, normalized size = 0.75

$$\frac{\sec(c)\sec^6(c+dx)(15\sin(c+2dx)+6\sin(3c+4dx)+\sin(5c+6dx)-10\sin(c)-10i\cos(c))}{60ad}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^8/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (Sec[c]*Sec[c + d*x]^6*((-10*I)*Cos[c] - 10*Sin[c] + 15*Sin[c + 2*d*x] + 6*
Sin[3*c + 4*d*x] + Sin[5*c + 6*d*x]))/(60*a*d)
```

fricas [A] time = 0.45, size = 109, normalized size = 1.36

$$\frac{240i\,e^{(4i\,dx+4i\,c)}+96i\,e^{(2i\,dx+2i\,c)}+16i}{15\left(ade^{(12i\,dx+12i\,c)}+6\,ade^{(10i\,dx+10i\,c)}+15\,ade^{(8i\,dx+8i\,c)}+20\,ade^{(6i\,dx+6i\,c)}+15\,ade^{(4i\,dx+4i\,c)}+6\,ade^{(2i\,dx+2i\,c)}+ad\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/15*(240*I*e^(4*I*d*x + 4*I*c) + 96*I*e^(2*I*d*x + 2*I*c) + 16*I)/(a*d*e^(
12*I*d*x + 12*I*c) + 6*a*d*e^(10*I*d*x + 10*I*c) + 15*a*d*e^(8*I*d*x + 8*I*
c) + 20*a*d*e^(6*I*d*x + 6*I*c) + 15*a*d*e^(4*I*d*x + 4*I*c) + 6*a*d*e^(2*I
*d*x + 2*I*c) + a*d)
```

giac [A] time = 0.68, size = 67, normalized size = 0.84

$$-\frac{5i\,\tan\left(dx+c\right)^{6}-6\,\tan\left(dx+c\right)^{5}+15i\,\tan\left(dx+c\right)^{4}-20\,\tan\left(dx+c\right)^{3}+15i\,\tan\left(dx+c\right)^{2}-30\,\tan\left(dx+c\right)}{30\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/30*(5*I*tan(d*x + c)^6 - 6*tan(d*x + c)^5 + 15*I*tan(d*x + c)^4 - 20*tan
(d*x + c)^3 + 15*I*tan(d*x + c)^2 - 30*tan(d*x + c))/(a*d)
```

maple [A] time = 0.34, size = 68, normalized size = 0.85

$$\frac{\tan\left(dx+c\right)-\frac{i\left(\tan^{6}\left(dx+c\right)\right)}{6}+\frac{\left(\tan^{5}\left(dx+c\right)\right)}{5}-\frac{i\left(\tan^{4}\left(dx+c\right)\right)}{2}+\frac{2\left(\tan^{3}\left(dx+c\right)\right)}{3}-\frac{i\left(\tan^{2}\left(dx+c\right)\right)}{2}}{da}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^8/(a+I*a*tan(d*x+c)),x)
```

```
[Out] 1/d/a*(tan(d*x+c)-1/6*I*tan(d*x+c)^6+1/5*tan(d*x+c)^5-1/2*I*tan(d*x+c)^4+2/
3*tan(d*x+c)^3-1/2*I*tan(d*x+c)^2)
```

maxima [A] time = 0.39, size = 67, normalized size = 0.84

$$-\frac{10i\,\tan\left(dx+c\right)^{6}-12\,\tan\left(dx+c\right)^{5}+30i\,\tan\left(dx+c\right)^{4}-40\,\tan\left(dx+c\right)^{3}+30i\,\tan\left(dx+c\right)^{2}-60\,\tan\left(dx+c\right)}{60\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/60*(10*I*tan(d*x + c)^6 - 12*tan(d*x + c)^5 + 30*I*tan(d*x + c)^4 - 40*t
an(d*x + c)^3 + 30*I*tan(d*x + c)^2 - 60*tan(d*x + c))/(a*d)
```

mupad [B] time = 3.32, size = 114, normalized size = 1.42

$$\frac{\sin\left(c+d\,x\right)\,\left(30\cos\left(c+d\,x\right)^{5}-\cos\left(c+d\,x\right)^{4}\,\sin\left(c+d\,x\right)\,15\mathrm{i}+20\cos\left(c+d\,x\right)^{3}\,\sin\left(c+d\,x\right)^{2}-\cos\left(c+d\,x\right)^{2}\,\mathrm{s}}{30\,a\,d\cos\left(c+d\,x\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^8*(a + a*tan(c + d*x)*1i)),x)
```

```
[Out] (sin(c + d*x)*(6*cos(c + d*x)*sin(c + d*x)^4 - cos(c + d*x)^4*sin(c + d*x)*
15i + 30*cos(c + d*x)^5 - sin(c + d*x)^5*5i - cos(c + d*x)^2*sin(c + d*x)^3
*15i + 20*cos(c + d*x)^3*sin(c + d*x)^2))/(30*a*d*cos(c + d*x)^6)
```

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

$$-\frac{i\int \frac{\sec^8(c+dx)}{\tan(c+dx)-i}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8/(a+I*a*tan(d*x+c)),x)
```

```
[Out] -I*Integral(sec(c + d*x)**8/(tan(c + d*x) - I), x)/a
```

3.101 $\int \frac{\sec^6(c+dx)}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=55

$$\frac{2i(a-ia\tan(c+dx))^3}{3a^4d}-\frac{i(a-ia\tan(c+dx))^4}{4a^5d}$$

```
[Out] 2/3*I*(a-I*a*tan(d*x+c))^3/a^4/d-1/4*I*(a-I*a*tan(d*x+c))^4/a^5/d
```

Rubi [A] time = 0.05, antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{2i(a-ia\tan(c+dx))^3}{3a^4d}-\frac{i(a-ia\tan(c+dx))^4}{4a^5d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (((2*I)/3)*(a - I*a*Tan[c + d*x])^3)/(a^4*d) - ((I/4)*(a - I*a*Tan[c + d*x]
)^4)/(a^5*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^6(c+dx)}{a+ia\tan(c+dx)}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^2(a+x)\,dx,x,ia\tan(c+dx)\right)}{a^5d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(2a(a-x)^2-(a-x)^3\right)\,dx,x,ia\tan(c+dx)\right)}{a^5d}\\ &= \frac{2i(a-ia\tan(c+dx))^3}{3a^4d}-\frac{i(a-ia\tan(c+dx))^4}{4a^5d}\end{aligned}$$

Mathematica [A] time = 0.21, size = 49, normalized size = 0.89

$$\frac{\sec(c)\sec^4(c+dx)(4\sin(c+2dx)+\sin(3c+4dx)-3\sin(c)-3i\cos(c))}{12ad}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (Sec[c]*Sec[c + d*x]^4*((-3*I)*Cos[c] - 3*Sin[c] + 4*Sin[c + 2*d*x] + Sin[3
*c + 4*d*x]))/(12*a*d)
```

fricas [A] time = 0.59, size = 72, normalized size = 1.31

$$\frac{16i\,e^{(2i\,dx+2i\,c)}+4i}{3\left(ade^{(8i\,dx+8i\,c)}+4\,ade^{(6i\,dx+6i\,c)}+6\,ade^{(4i\,dx+4i\,c)}+4\,ade^{(2i\,dx+2i\,c)}+ad\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/3*(16*I*e^(2*I*d*x + 2*I*c) + 4*I)/(a*d*e^(8*I*d*x + 8*I*c) + 4*a*d*e^(6*
I*d*x + 6*I*c) + 6*a*d*e^(4*I*d*x + 4*I*c) + 4*a*d*e^(2*I*d*x + 2*I*c) + a*
d)
```

giac [A] time = 0.56, size = 47, normalized size = 0.85

$$-\frac{3i\,\tan\left(dx+c\right)^{4}-4\,\tan\left(dx+c\right)^{3}+6i\,\tan\left(dx+c\right)^{2}-12\,\tan\left(dx+c\right)}{12\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/12*(3*I*tan(d*x + c)^4 - 4*tan(d*x + c)^3 + 6*I*tan(d*x + c)^2 - 12*tan(
d*x + c))/(a*d)
```

maple [A] time = 0.38, size = 47, normalized size = 0.85

$$\frac{\tan\left(dx+c\right)-\frac{i\left(\tan^{4}\left(dx+c\right)\right)}{4}+\frac{\left(\tan^{3}\left(dx+c\right)\right)}{3}-\frac{i\left(\tan^{2}\left(dx+c\right)\right)}{2}}{da}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6/(a+I*a*tan(d*x+c)),x)
```

```
[Out] 1/d/a*(tan(d*x+c)-1/4*I*tan(d*x+c)^4+1/3*tan(d*x+c)^3-1/2*I*tan(d*x+c)^2)
```

maxima [A] time = 0.55, size = 47, normalized size = 0.85

$$\frac{-3i\,\tan\left(dx+c\right)^{4}+4\,\tan\left(dx+c\right)^{3}-6i\,\tan\left(dx+c\right)^{2}+12\,\tan\left(dx+c\right)}{12\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/12*(-3*I*tan(d*x + c)^4 + 4*tan(d*x + c)^3 - 6*I*tan(d*x + c)^2 + 12*tan(
d*x + c))/(a*d)
```

mupad [B] time = 3.34, size = 77, normalized size = 1.40

$$\frac{\sin\left(c+d\,x\right)\,\left(12\cos\left(c+d\,x\right)^{3}-\cos\left(c+d\,x\right)^{2}\,\sin\left(c+d\,x\right)\,6\mathrm{i}+4\,\cos\left(c+d\,x\right)\,\sin\left(c+d\,x\right)^{2}-\sin\left(c+d\,x\right)^{3}\,3}{12\,a\,d\cos\left(c+d\,x\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)),x)
```

```
[Out] (sin(c + d*x)*(4*cos(c + d*x)*sin(c + d*x)^2 - cos(c + d*x)^2*sin(c + d*x)*
6i + 12*cos(c + d*x)^3 - sin(c + d*x)^3*3i))/(12*a*d*cos(c + d*x)^4)
```

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

$$-\frac{i\int\frac{\sec^{6}\left(c+dx\right)}{\tan\left(c+dx\right)-i}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6/(a+I*a*tan(d*x+c)),x)
```

```
[Out] -I*Integral(sec(c + d*x)**6/(tan(c + d*x) - I), x)/a
```

3.102 $\int \frac{\sec^4(c+dx)}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=34

$$\frac{\tan(c+dx)}{ad}-\frac{i\tan^2(c+dx)}{2ad}$$

```
[Out] tan(d*x+c)/a/d-1/2*I*tan(d*x+c)^2/a/d
```

Rubi [A] time = 0.04, antiderivative size = 34, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 1, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.042, Rules used = {3487}

$$\frac{\tan(c+dx)}{ad}-\frac{i\tan^2(c+dx)}{2ad}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] Tan[c + d*x]/(a*d) - ((I/2)*Tan[c + d*x]^2)/(a*d)
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^4(c+dx)}{a+ia\tan(c+dx)}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)\,dx, x, ia\tan(c+dx)\right)}{a^3d}\\ &= \frac{\tan(c+dx)}{ad}-\frac{i\tan^2(c+dx)}{2ad}\end{aligned}$$

Mathematica [A] time = 0.21, size = 35, normalized size = 1.03

$$\frac{\sec(c+dx)(2\sec(c)\sin(dx)-i\sec(c+dx))}{2ad}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (Sec[c + d*x]*((-I)*Sec[c + d*x] + 2*Sec[c]*Sin[d*x]))/(2*a*d)
```

fricas [A] time = 0.54, size = 33, normalized size = 0.97

$$\frac{2i}{ade^{(4i\,dx+4i\,c)}+2\,ade^{(2i\,dx+2i\,c)}+ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 2*I/(a*d*e^(4*I*d*x + 4*I*c) + 2*a*d*e^(2*I*d*x + 2*I*c) + a*d)
```

giac [A] time = 1.42, size = 27, normalized size = 0.79

$$-\frac{i\,\tan(dx+c)^2-2\,\tan(dx+c)}{2\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/2*(I*tan(d*x + c)^2 - 2*tan(d*x + c))/(a*d)
```

maple [A] time = 0.35, size = 26, normalized size = 0.76

$$\frac{\tan \left(dx+c\right)-\frac{i\left(\tan^{2}\left(dx+c\right)\right)}{2}}{da}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4/(a+I*a*tan(d*x+c)),x)
```

```
[Out] 1/d/a*(tan(d*x+c)-1/2*I*tan(d*x+c)^2)
```

maxima [A] time = 0.31, size = 27, normalized size = 0.79

$$-\frac{i \tan \left(dx+c\right)^{2}-2 \tan \left(dx+c\right)}{2 \, ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/2*(I*tan(d*x + c)^2 - 2*tan(d*x + c))/(a*d)
```

mupad [B] time = 3.33, size = 25, normalized size = 0.74

$$-\frac{\tan \left(c+d\,x\right)\,\left(-2+\tan \left(c+d\,x\right)\,1{}\mathrm{i}\right)}{2\,a\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)),x)
```

```
[Out] -(tan(c + d*x)*(tan(c + d*x)*1i - 2))/(2*a*d)
```

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

$$-\frac{i \int \frac{\sec^{4}{\left(c+dx \right)}}{\tan{\left(c+dx \right)}-i}\, dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4/(a+I*a*tan(d*x+c)),x)
```

```
[Out] -I*Integral(sec(c + d*x)**4/(tan(c + d*x) - I), x)/a
```

3.103 $\int \frac{\sec^2(c+dx)}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=23

$$\frac{x}{a}+\frac{i\log(\cos(c+dx))}{ad}$$

[Out] x/a+I*ln(cos(d*x+c))/a/d

Rubi [A] time = 0.04, antiderivative size = 23, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 31}

$$\frac{x}{a}+\frac{i\log(\cos(c+dx))}{ad}$$

Antiderivative was successfully verified.

[In] Int[Sec[c + d*x]^2/(a + I*a*Tan[c + d*x]),x]

[Out] x/a + (I*Log[Cos[c + d*x]])/(a*d)

Rule 31

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^2(c+dx)}{a+ia\tan(c+dx)}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{1}{a+x}\,dx, x, ia\tan(c+dx)\right)}{ad}\\ &= \frac{x}{a}+\frac{i\log(\cos(c+dx))}{ad}\end{aligned}$$

Mathematica [A] time = 0.12, size = 31, normalized size = 1.35

$$\frac{2\tan^{-1}(\tan(dx))+i\log\left(\cos^2(c+dx)\right)}{2ad}$$

Antiderivative was successfully verified.

[In] Integrate[Sec[c + d*x]^2/(a + I*a*Tan[c + d*x]),x]

[Out] (2*ArcTan[Tan[d*x]] + I*Log[Cos[c + d*x]^2])/(2*a*d)

fricas [A] time = 0.44, size = 26, normalized size = 1.13

$$\frac{2\,dx+i\,\log\left(e^{(2i\,dx+2i\,c)}+1\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
[Out] (2*d*x + I*log(e^(2*I*d*x + 2*I*c) + 1))/(a*d)
```

giac [B] time = 2.27, size = 57, normalized size = 2.48

$$-\frac{-\frac{i\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a}+\frac{2i\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)}{a}-\frac{i\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)}{a}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c)),x, algorithm="giac")
[Out] -(-I*log(tan(1/2*d*x + 1/2*c) + 1)/a + 2*I*log(tan(1/2*d*x + 1/2*c) - I)/a
- I*log(tan(1/2*d*x + 1/2*c) - 1)/a)/d
```

maple [A] time = 0.26, size = 23, normalized size = 1.00

$$-\frac{i\ln\left(a+ia\tan\left(dx+c\right)\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2/(a+I*a*tan(d*x+c)),x)
[Out] -I/a/d*ln(a+I*a*tan(d*x+c))
```

maxima [A] time = 0.33, size = 20, normalized size = 0.87

$$-\frac{i\,\log\left(i\,a\tan\left(dx+c\right)+a\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
[Out] -I*log(I*a*tan(d*x + c) + a)/(a*d)
```

mupad [B] time = 3.35, size = 19, normalized size = 0.83

$$-\frac{\ln\left(\tan\left(c+d\,x\right)-\mathrm{i}\right)\,1\mathrm{i}}{a\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)),x)
[Out] -(log(tan(c + d*x) - 1i)*1i)/(a*d)
```

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

$$-\frac{i\int\frac{\sec^{2}\left(c+dx\right)}{\tan\left(c+dx\right)-i}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2/(a+I*a*tan(d*x+c)),x)
[Out] -I*Integral(sec(c + d*x)**2/(tan(c + d*x) - I), x)/a
```

3.104 $\int \frac{1}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=33

$$\frac{x}{2a}+\frac{i}{2d(a+ia\tan(c+dx))}$$

```
[Out] 1/2*x/a+1/2*I/d/(a+I*a*tan(d*x+c))
```

Rubi [A] time = 0.01, antiderivative size = 33, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {3479, 8}

$$\frac{x}{2a}+\frac{i}{2d(a+ia\tan(c+dx))}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^(-1),x]
```

```
[Out] x/(2*a) + (I/2)/(d*(a + I*a*Tan[c + d*x]))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 3479

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

Rubi steps

$$\begin{aligned}\int \frac{1}{a+ia\tan(c+dx)}\,dx &= \frac{i}{2d(a+ia\tan(c+dx))}+\frac{\int 1\,dx}{2a}\\ &= \frac{x}{2a}+\frac{i}{2d(a+ia\tan(c+dx))}\end{aligned}$$

Mathematica [A] time = 0.11, size = 45, normalized size = 1.36

$$\frac{(2dx-i)\tan(c+dx)-2idx+1}{4ad(\tan(c+dx)-i)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^(-1),x]
```

```
[Out] (1 - (2*I)*d*x + (-I + 2*d*x)*Tan[c + d*x])/(4*a*d*(-I + Tan[c + d*x]))
```

fricas [A] time = 0.56, size = 32, normalized size = 0.97

$$\frac{\left(2\,dxe^{(2i\,dx+2i\,c)}+i\right)e^{(-2i\,dx-2i\,c)}}{4\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

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

giac [B] time = 0.40, size = 60, normalized size = 1.82

$$-\frac{\frac{i \log(\tan(dx+c)-i)}{a} - \frac{i \log(-i \tan(dx+c)+1)}{a} + \frac{-i \tan(dx+c)-3}{a(\tan(dx+c)-i)}}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/4*(I*log(tan(d*x + c) - I)/a - I*log(-I*tan(d*x + c) + 1)/a + (-I*tan(d*
x + c) - 3)/(a*(tan(d*x + c) - I)))/d
```

maple [B] time = 0.11, size = 59, normalized size = 1.79

$$\frac{i \ln(\tan(dx+c)+i)}{4da} - \frac{i \ln(\tan(dx+c)-i)}{4da} + \frac{1}{2da(\tan(dx+c)-i)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+I*a*tan(d*x+c)),x)
```

```
[Out] 1/4*I/d/a*ln(tan(d*x+c)+I)-1/4*I/d/a*ln(tan(d*x+c)-I)+1/2/d/a/(tan(d*x+c)-I
)
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 3.36, size = 29, normalized size = 0.88

$$\frac{x}{2\,a} + \frac{1\mathrm{i}}{2\,a\,d\,\left(1+\tan\left(c+d\,x\right)\,1\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a + a*tan(c + d*x)*1i),x)
```

```
[Out] x/(2*a) + 1i/(2*a*d*(tan(c + d*x)*1i + 1))
```

sympy [A] time = 0.15, size = 61, normalized size = 1.85

$$\begin{cases} \frac{ie^{-2ic}e^{-2idx}}{4ad} & \text{for}\ 4ade^{2ic} \neq 0 \\ x\left(\frac{\left(e^{2ic}+1\right)e^{-2ic}}{2a} - \frac{1}{2a}\right) & \text{otherwise} \end{cases} + \frac{x}{2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+I*a*tan(d*x+c)),x)
```

```
[Out] Piecewise((I*exp(-2*I*c)*exp(-2*I*d*x)/(4*a*d), Ne(4*a*d*exp(2*I*c), 0)), (
x*((exp(2*I*c) + 1)*exp(-2*I*c)/(2*a) - 1/(2*a)), True)) + x/(2*a)
```

3.105 $\int \frac{\cos^2(c+dx)}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=82

$$\frac{ia}{8d(a+ia\tan(c+dx))^2}-\frac{i}{8d(a-ia\tan(c+dx))}+\frac{i}{4d(a+ia\tan(c+dx))}+\frac{3x}{8a}$$

```
[Out] 3/8*x/a-1/8*I/d/(a-I*a*tan(d*x+c))+1/8*I*a/d/(a+I*a*tan(d*x+c))^2+1/4*I/d/(
a+I*a*tan(d*x+c))
```

Rubi [A] time = 0.07, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3487, 44, 206}

$$\frac{ia}{8d(a+ia\tan(c+dx))^2}-\frac{i}{8d(a-ia\tan(c+dx))}+\frac{i}{4d(a+ia\tan(c+dx))}+\frac{3x}{8a}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (3*x)/(8*a) - (I/8)/(d*(a - I*a*Tan[c + d*x])) + ((I/8)*a)/(d*(a + I*a*Tan[
c + d*x])^2) + (I/4)/(d*(a + I*a*Tan[c + d*x]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 206

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}
\int \frac{\cos^2(c+dx)}{a+ia\tan(c+dx)}\,dx &= -\frac{\left(ia^3\right)\text{Subst}\left(\int \frac{1}{(a-x)^2(a+x)^3}\,dx, x, ia\tan(c+dx)\right)}{d}\\
&= -\frac{\left(ia^3\right)\text{Subst}\left(\int \left(\frac{1}{8a^3(a-x)^2}+\frac{1}{4a^2(a+x)^3}+\frac{1}{4a^3(a+x)^2}+\frac{3}{8a^3\left(a^2-x^2\right)}\right)dx, x, ia\tan(c+dx)\right)}{d}\\
&= -\frac{i}{8d(a-ia\tan(c+dx))}+\frac{ia}{8d(a+ia\tan(c+dx))^2}+\frac{i}{4d(a+ia\tan(c+dx))}-\frac{(3i)\,\text{S}\cdots}{\cdots}\\
&= \frac{3x}{8a}-\frac{i}{8d(a-ia\tan(c+dx))}+\frac{ia}{8d(a+ia\tan(c+dx))^2}+\frac{i}{4d(a+ia\tan(c+dx))}
\end{aligned}$$

Mathematica [A] time = 0.28, size = 78, normalized size = 0.95

$$-\frac{2\cos(2(c+dx))-12dx\tan(c+dx)+6i\tan(c+dx)+3i\sin(3(c+dx))\sec(c+dx)+12idx-7}{32ad(\tan(c+dx)-i)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] -1/32*(-7 + (12*I)*d*x + 2*Cos[2*(c + d*x)] + (3*I)*Sec[c + d*x]*Sin[3*(c +
 d*x)] + (6*I)*Tan[c + d*x] - 12*d*x*Tan[c + d*x])/(a*d*(-I + Tan[c + d*x])
)
```

fricas [A] time = 0.44, size = 54, normalized size = 0.66

$$\frac{\left(12\,dxe^{(4i\,dx+4i\,c)}-2i\,e^{(6i\,dx+6i\,c)}+6i\,e^{(2i\,dx+2i\,c)}+i\right)e^{(-4i\,dx-4i\,c)}}{32\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/32*(12*d*x*e^(4*I*d*x + 4*I*c) - 2*I*e^(6*I*d*x + 6*I*c) + 6*I*e^(2*I*d*x
 + 2*I*c) + I)*e^(-4*I*d*x - 4*I*c)/(a*d)
```

giac [A] time = 0.89, size = 99, normalized size = 1.21

$$-\frac{\frac{6i\log(i\tan(dx+c)+1)}{a}-\frac{6i\log(i\tan(dx+c)-1)}{a}+\frac{2(3\tan(dx+c)+5i)}{a(-i\tan(dx+c)+1)}+\frac{-9i\tan(dx+c)^2-26\tan(dx+c)+21i}{a(\tan(dx+c)-i)^2}}{32\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/32*(6*I*log(I*tan(d*x + c) + 1)/a - 6*I*log(I*tan(d*x + c) - 1)/a + 2*(3
*tan(d*x + c) + 5*I)/(a*(-I*tan(d*x + c) + 1)) + (-9*I*tan(d*x + c)^2 - 26*
tan(d*x + c) + 21*I)/(a*(tan(d*x + c) - I)^2))/d
```

maple [A] time = 0.42, size = 98, normalized size = 1.20

$$\frac{3i\ln(\tan(dx+c)+i)}{16da}+\frac{1}{8ad(\tan(dx+c)+i)}-\frac{3i\ln(\tan(dx+c)-i)}{16da}-\frac{i}{8ad(\tan(dx+c)-i)^2}+\frac{1}{4da(\tan(dx+c)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2/(a+I*a*tan(d*x+c)),x)
```

```
[Out] 3/16*I/a/d*ln(tan(d*x+c)+I)+1/8/a/d/(tan(d*x+c)+I)-3/16*I/a/d*ln(tan(d*x+c)
-I)-1/8*I/a/d/(tan(d*x+c)-I)^2+1/4/d/a/(tan(d*x+c)-I)
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 3.45, size = 60, normalized size = 0.73

$$\frac{3x}{8a}-\frac{\frac{3\tan(c+dx)^2}{8}-\frac{\tan(c+dx)\,3\mathrm{i}}{8}+\frac{1}{4}}{a\,d\,(1+\tan(c+dx)\,1\mathrm{i})^2\,(\tan(c+dx)+1\mathrm{i})}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2/(a + a*tan(c + d*x)*1i),x)
```

```
[Out] (3*x)/(8*a) - ((3*tan(c + d*x)^2)/8 - (tan(c + d*x)*3i)/8 + 1/4)/(a*d*(tan(
c + d*x)*1i + 1)^2*(tan(c + d*x) + 1i))
```

sympy [A] time = 0.30, size = 155, normalized size = 1.89

$$\begin{cases} -\frac{\left(512ia^2d^2e^{8ic}e^{2idx}-1536ia^2d^2e^{4ic}e^{-2idx}-256ia^2d^2e^{2ic}e^{-4idx}\right)e^{-6ic}}{8192a^3d^3} & \text{for } 8192a^3d^3e^{6ic}\neq 0 \\ x\left(\frac{\left(e^{6ic}+3e^{4ic}+3e^{2ic}+1\right)e^{-4ic}}{8a}-\frac{3}{8a}\right) & \text{otherwise} \end{cases}+\frac{3x}{8a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2/(a+I*a*tan(d*x+c)),x)
```

```
[Out] Piecewise((-(512*I*a**2*d**2*exp(8*I*c)*exp(2*I*d*x) - 1536*I*a**2*d**2*exp
(4*I*c)*exp(-2*I*d*x) - 256*I*a**2*d**2*exp(2*I*c)*exp(-4*I*d*x))*exp(-6*I*
c)/(8192*a**3*d**3), Ne(8192*a**3*d**3*exp(6*I*c), 0)), (x*((exp(6*I*c) + 3
*exp(4*I*c) + 3*exp(2*I*c) + 1)*exp(-4*I*c)/(8*a) - 3/(8*a)), True)) + 3*x/
(8*a)
```

3.106 $\int \frac{\cos^4(c+dx)}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=134

$$\frac{ia^2}{24d(a+ia\tan(c+dx))^3}-\frac{ia}{32d(a-ia\tan(c+dx))^2}+\frac{3ia}{32d(a+ia\tan(c+dx))^2}-\frac{i}{8d(a-ia\tan(c+dx))}+\frac{i}{16d(a+ia$$

```
[Out] 5/16*x/a-1/32*I*a/d/(a-I*a*tan(d*x+c))^2-1/8*I/d/(a-I*a*tan(d*x+c))+1/24*I*
a^2/d/(a+I*a*tan(d*x+c))^3+3/32*I*a/d/(a+I*a*tan(d*x+c))^2+3/16*I/d/(a+I*a*
tan(d*x+c))
```

Rubi [A] time = 0.09, antiderivative size = 134, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3487, 44, 206}

$$\frac{ia^2}{24d(a+ia\tan(c+dx))^3}-\frac{ia}{32d(a-ia\tan(c+dx))^2}+\frac{3ia}{32d(a+ia\tan(c+dx))^2}-\frac{i}{8d(a-ia\tan(c+dx))}+\frac{i}{16d(a+ia$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (5*x)/(16*a) - ((I/32)*a)/(d*(a - I*a*Tan[c + d*x])^2) - (I/8)/(d*(a - I*a*
Tan[c + d*x])) + ((I/24)*a^2)/(d*(a + I*a*Tan[c + d*x])^3) + (((3*I)/32)*a)
/(d*(a + I*a*Tan[c + d*x])^2) + ((3*I)/16)/(d*(a + I*a*Tan[c + d*x]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 206

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^4(c+dx)}{a+ia\tan(c+dx)}\,dx = -\frac{(ia^5)\,\text{Subst}\left(\int \frac{1}{(a-x)^3(a+x)^4}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{(ia^5)\,\text{Subst}\left(\int\left(\frac{1}{16a^4(a-x)^3}+\frac{1}{8a^5(a-x)^2}+\frac{1}{8a^3(a+x)^4}+\frac{3}{16a^4(a+x)^3}+\frac{3}{16a^5(a+x)^2}+\frac{5}{16a^5(a^2-x}\right.\right.}{d}$$

$$= -\frac{ia}{32d(a-ia\tan(c+dx))^2}-\frac{i}{8d(a-ia\tan(c+dx))}+\frac{ia^2}{24d(a+ia\tan(c+dx))^3}+ \ldots$$

$$= \frac{5x}{16a}-\frac{ia}{32d(a-ia\tan(c+dx))^2}-\frac{i}{8d(a-ia\tan(c+dx))}+\frac{ia^2}{24d(a+ia\tan(c+dx))^3}$$

Mathematica [A] time = 0.25, size = 109, normalized size = 0.81

$$-\frac{\sec(c+dx)(-120dx\sin(c+dx)+60i\sin(c+dx)+45i\sin(3(c+dx))+5i\sin(5(c+dx))+60i(2dx+i)\cos(}{384ad(\tan(c+dx)-i)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] -1/384*(Sec[c + d*x]*((60*I)*(I + 2*d*x)*Cos[c + d*x] + 15*Cos[3*(c + d*x)]
 + Cos[5*(c + d*x)] + (60*I)*Sin[c + d*x] - 120*d*x*Sin[c + d*x] + (45*I)*S
in[3*(c + d*x)] + (5*I)*Sin[5*(c + d*x)]))/(a*d*(-I + Tan[c + d*x]))
```

fricas [A] time = 0.54, size = 76, normalized size = 0.57

$$\frac{\left(120\,dxe^{(6i\,dx+6i\,c)}-3i\,e^{(10i\,dx+10i\,c)}-30i\,e^{(8i\,dx+8i\,c)}+60i\,e^{(4i\,dx+4i\,c)}+15i\,e^{(2i\,dx+2i\,c)}+2i\right)e^{(-6i\,dx-6i\,c)}}{384\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/384*(120*d*x*e^(6*I*d*x + 6*I*c) - 3*I*e^(10*I*d*x + 10*I*c) - 30*I*e^(8*
I*d*x + 8*I*c) + 60*I*e^(4*I*d*x + 4*I*c) + 15*I*e^(2*I*d*x + 2*I*c) + 2*I)
*e^(-6*I*d*x - 6*I*c)/(a*d)
```

giac [A] time = 2.22, size = 116, normalized size = 0.87

$$-\frac{-\frac{30i\log(\tan(dx+c)+i)}{a}+\frac{30i\log(\tan(dx+c)-i)}{a}+\frac{3\left(-15i\tan(dx+c)^2+38\tan(dx+c)+25i\right)}{a(-i\tan(dx+c)+1)^2}-\frac{55i\tan(dx+c)^3+201\tan(dx+c)^2-255i\tan(dx+}{a(\tan(dx+c)-i)^3}}{192\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/192*(-30*I*log(tan(d*x + c) + I)/a + 30*I*log(tan(d*x + c) - I)/a + 3*(-
15*I*tan(d*x + c)^2 + 38*tan(d*x + c) + 25*I)/(a*(-I*tan(d*x + c) + 1)^2) -
 (55*I*tan(d*x + c)^3 + 201*tan(d*x + c)^2 - 255*I*tan(d*x + c) - 117)/(a*(
tan(d*x + c) - I)^3))/d
```

maple [A] time = 0.42, size = 137, normalized size = 1.02

$$\frac{i}{32ad\left(\tan(dx+c)+i\right)^2}+\frac{5i\ln\left(\tan(dx+c)+i\right)}{32da}+\frac{1}{8ad\left(\tan(dx+c)+i\right)}-\frac{5i\ln\left(\tan(dx+c)-i\right)}{32da}-\frac{3i}{32ad\left(\tan(dx\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4/(a+I*a*tan(d*x+c)),x)
```

```
[Out] 1/32*I/a/d/(tan(d*x+c)+I)^2+5/32*I/a/d*ln(tan(d*x+c)+I)+1/8/a/d/(tan(d*x+c)
+I)-5/32*I/a/d*ln(tan(d*x+c)-I)-3/32*I/a/d/(tan(d*x+c)-I)^2-1/24/a/d/(tan(d
*x+c)-I)^3+3/16/d/a/(tan(d*x+c)-I)
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 3.72, size = 123, normalized size = 0.92

$$\frac{5\,x}{16\,a}+\frac{\frac{25\,\tan(c+d\,x)}{48\,a}+\frac{1\mathrm{i}}{6\,a}+\frac{\tan(c+d\,x)^2\,25\mathrm{i}}{48\,a}+\frac{5\,\tan(c+d\,x)^3}{16\,a}+\frac{\tan(c+d\,x)^4\,5\mathrm{i}}{16\,a}}{d\,\left(\tan\left(c+d\,x\right)^5\,1\mathrm{i}+\tan\left(c+d\,x\right)^4+\tan\left(c+d\,x\right)^3\,2\mathrm{i}+2\,\tan\left(c+d\,x\right)^2+\tan\left(c+d\,x\right)\,1\mathrm{i}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4/(a + a*tan(c + d*x)*1i),x)
```

```
[Out] (5*x)/(16*a) + ((25*tan(c + d*x))/(48*a) + 1i/(6*a) + (tan(c + d*x)^2*25i)/
(48*a) + (5*tan(c + d*x)^3)/(16*a) + (tan(c + d*x)^4*5i)/(16*a))/(d*(tan(c
+ d*x)*1i + 2*tan(c + d*x)^2 + tan(c + d*x)^3*2i + tan(c + d*x)^4 + tan(c +
 d*x)^5*1i + 1))
```

sympy [A] time = 0.43, size = 223, normalized size = 1.66

$$\begin{cases} -\frac{\left(50331648ia^4d^4e^{16ic}e^{4idx}+503316480ia^4d^4e^{14ic}e^{2idx}-1006632960ia^4d^4e^{10ic}e^{-2idx}-251658240ia^4d^4e^{8ic}e^{-4idx}-33554432ia^4d^4e^{6ic}e^{-6idx}\right)e^{-12ic}}{6442450944a^5d^5} & \text{fo} \\ x\left(\frac{\left(e^{10ic}+5e^{8ic}+10e^{6ic}+10e^{4ic}+5e^{2ic}+1\right)e^{-6ic}}{32a}-\frac{5}{16a}\right) & \text{ot} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4/(a+I*a*tan(d*x+c)),x)
```

```
[Out] Piecewise((-(50331648*I*a**4*d**4*exp(16*I*c)*exp(4*I*d*x) + 503316480*I*a*
*4*d**4*exp(14*I*c)*exp(2*I*d*x) - 1006632960*I*a**4*d**4*exp(10*I*c)*exp(-
2*I*d*x) - 251658240*I*a**4*d**4*exp(8*I*c)*exp(-4*I*d*x) - 33554432*I*a**4
*d**4*exp(6*I*c)*exp(-6*I*d*x))*exp(-12*I*c)/(6442450944*a**5*d**5), Ne(644
2450944*a**5*d**5*exp(12*I*c), 0)), (x*((exp(10*I*c) + 5*exp(8*I*c) + 10*ex
p(6*I*c) + 10*exp(4*I*c) + 5*exp(2*I*c) + 1)*exp(-6*I*c)/(32*a) - 5/(16*a))
, True)) + 5*x/(16*a)
```

3.107 $\int \frac{\sec^7(c+dx)}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=84

$$-\frac{i\sec^5(c+dx)}{5ad}+\frac{3\tanh^{-1}(\sin(c+dx))}{8ad}+\frac{\tan(c+dx)\sec^3(c+dx)}{4ad}+\frac{3\tan(c+dx)\sec(c+dx)}{8ad}$$

```
[Out] 3/8*arctanh(sin(d*x+c))/a/d-1/5*I*sec(d*x+c)^5/a/d+3/8*sec(d*x+c)*tan(d*x+c
)/a/d+1/4*sec(d*x+c)^3*tan(d*x+c)/a/d
```

Rubi [A] time = 0.08, antiderivative size = 84, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3501, 3768, 3770}

$$-\frac{i\sec^5(c+dx)}{5ad}+\frac{3\tanh^{-1}(\sin(c+dx))}{8ad}+\frac{\tan(c+dx)\sec^3(c+dx)}{4ad}+\frac{3\tan(c+dx)\sec(c+dx)}{8ad}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^7/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (3*ArcTanh[Sin[c + d*x]])/(8*a*d) - ((I/5)*Sec[c + d*x]^5)/(a*d) + (3*Sec[c
 + d*x]*Tan[c + d*x])/(8*a*d) + (Sec[c + d*x]^3*Tan[c + d*x])/(4*a*d)
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3768

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sec^7(c+dx)}{a+ia\tan(c+dx)}\,dx &= -\frac{i\sec^5(c+dx)}{5ad}+\frac{\int \sec^5(c+dx)\,dx}{a}\\
&= -\frac{i\sec^5(c+dx)}{5ad}+\frac{\sec^3(c+dx)\tan(c+dx)}{4ad}+\frac{3\int \sec^3(c+dx)\,dx}{4a}\\
&= -\frac{i\sec^5(c+dx)}{5ad}+\frac{3\sec(c+dx)\tan(c+dx)}{8ad}+\frac{\sec^3(c+dx)\tan(c+dx)}{4ad}+\frac{3\int \sec(c}{8}\\
&= \frac{3\tanh^{-1}(\sin(c+dx))}{8ad}-\frac{i\sec^5(c+dx)}{5ad}+\frac{3\sec(c+dx)\tan(c+dx)}{8ad}+\frac{\sec^3(c+dx)}{4a}
\end{aligned}$$

Mathematica [A] time = 0.40, size = 60, normalized size = 0.71

$$\frac{240\tanh^{-1}\left(\cos(c)\tan\left(\frac{dx}{2}\right)+\sin(c)\right)+(70\sin(2(c+dx))+15\sin(4(c+dx))-64i)\sec^5(c+dx)}{320ad}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^7/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (240*ArcTanh[Sin[c] + Cos[c]*Tan[(d*x)/2]] + Sec[c + d*x]^5*(-64*I + 70*Sin
[2*(c + d*x)] + 15*Sin[4*(c + d*x)]))/(320*a*d)
```

fricas [B] time = 0.64, size = 266, normalized size = 3.17

$$\frac{15\left(e^{(10i\,dx+10i\,c)}+5\,e^{(8i\,dx+8i\,c)}+10\,e^{(6i\,dx+6i\,c)}+10\,e^{(4i\,dx+4i\,c)}+5\,e^{(2i\,dx+2i\,c)}+1\right)\log\left(e^{(i\,dx+i\,c)}+i\right)-15\left(e^{(10i\,dx+10i\,c)}\right.}{40\left(ade^{(10i\,dx+10i\,c)}+5\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/40*(15*(e^(10*I*d*x + 10*I*c) + 5*e^(8*I*d*x + 8*I*c) + 10*e^(6*I*d*x + 6
*I*c) + 10*e^(4*I*d*x + 4*I*c) + 5*e^(2*I*d*x + 2*I*c) + 1)*log(e^(I*d*x +
I*c) + I) - 15*(e^(10*I*d*x + 10*I*c) + 5*e^(8*I*d*x + 8*I*c) + 10*e^(6*I*d
*x + 6*I*c) + 10*e^(4*I*d*x + 4*I*c) + 5*e^(2*I*d*x + 2*I*c) + 1)*log(e^(I*
d*x + I*c) - I) - 30*I*e^(9*I*d*x + 9*I*c) - 140*I*e^(7*I*d*x + 7*I*c) - 25
6*I*e^(5*I*d*x + 5*I*c) + 140*I*e^(3*I*d*x + 3*I*c) + 30*I*e^(I*d*x + I*c))
/(a*d*e^(10*I*d*x + 10*I*c) + 5*a*d*e^(8*I*d*x + 8*I*c) + 10*a*d*e^(6*I*d*x
 + 6*I*c) + 10*a*d*e^(4*I*d*x + 4*I*c) + 5*a*d*e^(2*I*d*x + 2*I*c) + a*d)
```

giac [A] time = 0.72, size = 138, normalized size = 1.64

$$\frac{\frac{15\log\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right)}{a}-\frac{15\log\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right)}{a}+\frac{2\left(25\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^9+40i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^8-10\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^7+80i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^4+10\right.}{\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1\right)^5a}}{40\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/40*(15*log(tan(1/2*d*x + 1/2*c) + 1)/a - 15*log(tan(1/2*d*x + 1/2*c) - 1)
/a + 2*(25*tan(1/2*d*x + 1/2*c)^9 + 40*I*tan(1/2*d*x + 1/2*c)^8 - 10*tan(1/
2*d*x + 1/2*c)^7 + 80*I*tan(1/2*d*x + 1/2*c)^4 + 10*tan(1/2*d*x + 1/2*c)^3
- 25*tan(1/2*d*x + 1/2*c) + 8*I)/((tan(1/2*d*x + 1/2*c)^2 - 1)^5*a))/d
```

maple [B] time = 0.36, size = 430, normalized size = 5.12

$$\frac{5i}{8ad\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2}+\frac{7}{8ad\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2}+\frac{3i}{8ad\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\frac{5}{8ad\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\frac{3}{4ad\left(\tan\left(\frac{d}{2}\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^7/(a+I*a*tan(d*x+c)),x)
```

```
[Out] 5/8*I/a/d/(tan(1/2*d*x+1/2*c)-1)^2+7/8/a/d/(tan(1/2*d*x+1/2*c)-1)^2+3/8*I/a
/d/(tan(1/2*d*x+1/2*c)-1)+5/8/a/d/(tan(1/2*d*x+1/2*c)-1)+3/4*I/a/d/(tan(1/2
*d*x+1/2*c)-1)^3+1/2/a/d/(tan(1/2*d*x+1/2*c)-1)^3-3/8*I/a/d/(tan(1/2*d*x+1/
2*c)+1)+1/4/a/d/(tan(1/2*d*x+1/2*c)-1)^4-1/5*I/a/d/(tan(1/2*d*x+1/2*c)+1)^5
```

```
-3/8/a/d*ln(tan(1/2*d*x+1/2*c)-1)+5/8*I/a/d/(tan(1/2*d*x+1/2*c)+1)^2+5/8/a/
d/(tan(1/2*d*x+1/2*c)+1)+1/2*I/a/d/(tan(1/2*d*x+1/2*c)-1)^4+1/2/a/d/(tan(1/
2*d*x+1/2*c)+1)^3+1/5*I/a/d/(tan(1/2*d*x+1/2*c)-1)^5-1/4/a/d/(tan(1/2*d*x+1
/2*c)+1)^4+1/2*I/a/d/(tan(1/2*d*x+1/2*c)+1)^4-7/8/a/d/(tan(1/2*d*x+1/2*c)+1
)^2-3/4*I/a/d/(tan(1/2*d*x+1/2*c)+1)^3+3/8/a/d*ln(tan(1/2*d*x+1/2*c)+1)
```

maxima [B] time = 0.51, size = 289, normalized size = 3.44

$$\frac{\frac{16\left(-\frac{75i\sin(dx+c)}{\cos(dx+c)+1}+\frac{30i\sin(dx+c)^3}{(\cos(dx+c)+1)^3}-\frac{240\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{30i\sin(dx+c)^7}{(\cos(dx+c)+1)^7}-\frac{120\sin(dx+c)^8}{(\cos(dx+c)+1)^8}+\frac{75i\sin(dx+c)^9}{(\cos(dx+c)+1)^9}-24\right)}{-120ia+\frac{600ia\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-\frac{1200ia\sin(dx+c)^4}{(\cos(dx+c)+1)^4}+\frac{1200ia\sin(dx+c)^6}{(\cos(dx+c)+1)^6}-\frac{600ia\sin(dx+c)^8}{(\cos(dx+c)+1)^8}+\frac{120ia\sin(dx+c)^{10}}{(\cos(dx+c)+1)^{10}}}+\frac{3\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{a}-\frac{3\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}\cdots\right)}{a}}{8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/8*(16*(-75*I*sin(d*x + c)/(cos(d*x + c) + 1) + 30*I*sin(d*x + c)^3/(cos(d
*x + c) + 1)^3 - 240*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 30*I*sin(d*x + c
)^7/(cos(d*x + c) + 1)^7 - 120*sin(d*x + c)^8/(cos(d*x + c) + 1)^8 + 75*I*s
in(d*x + c)^9/(cos(d*x + c) + 1)^9 - 24)/(-120*I*a + 600*I*a*sin(d*x + c)^2
/(cos(d*x + c) + 1)^2 - 1200*I*a*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + 1200
*I*a*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 - 600*I*a*sin(d*x + c)^8/(cos(d*x
+ c) + 1)^8 + 120*I*a*sin(d*x + c)^10/(cos(d*x + c) + 1)^10) + 3*log(sin(d*
x + c)/(cos(d*x + c) + 1) + 1)/a - 3*log(sin(d*x + c)/(cos(d*x + c) + 1) -
1)/a)/d
```

mupad [B] time = 7.01, size = 193, normalized size = 2.30

$$\frac{3\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{4\,a\,d}+\frac{\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{2\,a}-\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{2\,a}+\frac{5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9}{4\,a}-\frac{5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{4\,a}+\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4\,4\mathrm{i}}{a}+\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8\cdots}{a}\cdots}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}-5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8+10\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6-10\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+5\tan\left(\cdots\right)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^7*(a + a*tan(c + d*x)*1i)),x)
```

```
[Out] (3*atanh(tan(c/2 + (d*x)/2)))/(4*a*d) + (tan(c/2 + (d*x)/2)^3/(2*a) + (tan(
c/2 + (d*x)/2)^4*4i)/a - tan(c/2 + (d*x)/2)^7/(2*a) + (tan(c/2 + (d*x)/2)^8
*2i)/a + (5*tan(c/2 + (d*x)/2)^9)/(4*a) + 2i/(5*a) - (5*tan(c/2 + (d*x)/2))
/(4*a))/(d*(5*tan(c/2 + (d*x)/2)^2 - 10*tan(c/2 + (d*x)/2)^4 + 10*tan(c/2 +
 (d*x)/2)^6 - 5*tan(c/2 + (d*x)/2)^8 + tan(c/2 + (d*x)/2)^10 - 1))
```

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

$$-\frac{i\int\frac{\sec^7(c+dx)}{\tan(c+dx)-i}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**7/(a+I*a*tan(d*x+c)),x)
```

```
[Out] -I*Integral(sec(c + d*x)**7/(tan(c + d*x) - I), x)/a
```

3.108 $\int \frac{\sec^5(c+dx)}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=60

$$-\frac{i\sec^3(c+dx)}{3ad}+\frac{\tanh^{-1}(\sin(c+dx))}{2ad}+\frac{\tan(c+dx)\sec(c+dx)}{2ad}$$

```
[Out] 1/2*arctanh(sin(d*x+c))/a/d-1/3*I*sec(d*x+c)^3/a/d+1/2*sec(d*x+c)*tan(d*x+c
)/a/d
```

Rubi [A] time = 0.05, antiderivative size = 60, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3501, 3768, 3770}

$$-\frac{i\sec^3(c+dx)}{3ad}+\frac{\tanh^{-1}(\sin(c+dx))}{2ad}+\frac{\tan(c+dx)\sec(c+dx)}{2ad}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^5/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ArcTanh[Sin[c + d*x]]/(2*a*d) - ((I/3)*Sec[c + d*x]^3)/(a*d) + (Sec[c + d*x
]*Tan[c + d*x])/(2*a*d)
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3768

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^5(c+dx)}{a+ia\tan(c+dx)}\,dx &= -\frac{i\sec^3(c+dx)}{3ad}+\frac{\int \sec^3(c+dx)\,dx}{a}\\ &= -\frac{i\sec^3(c+dx)}{3ad}+\frac{\sec(c+dx)\tan(c+dx)}{2ad}+\frac{\int \sec(c+dx)\,dx}{2a}\\ &= \frac{\tanh^{-1}(\sin(c+dx))}{2ad}-\frac{i\sec^3(c+dx)}{3ad}+\frac{\sec(c+dx)\tan(c+dx)}{2ad}\end{aligned}$$

Mathematica [A] time = 0.25, size = 50, normalized size = 0.83

$$\frac{12\tanh^{-1}\left(\cos(c)\tan\left(\frac{dx}{2}\right)+\sin(c)\right)+(3\sin(2(c+dx))-4i)\sec^3(c+dx)}{12ad}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^5/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (12*ArcTanh[Sin[c] + Cos[c]*Tan[(d*x)/2]] + Sec[c + d*x]^3*(-4*I + 3*Sin[2*
(c + d*x)]))/(12*a*d)
```

fricas [B] time = 0.45, size = 174, normalized size = 2.90

$$\frac{3\left(e^{(6i\,dx+6i\,c)}+3\,e^{(4i\,dx+4i\,c)}+3\,e^{(2i\,dx+2i\,c)}+1\right)\log\left(e^{(i\,dx+i\,c)}+i\right)-3\left(e^{(6i\,dx+6i\,c)}+3\,e^{(4i\,dx+4i\,c)}+3\,e^{(2i\,dx+2i\,c)}+1\right)}{6\left(ade^{(6i\,dx+6i\,c)}+3\,ade^{(4i\,dx+4i\,c)}+3\,ade^{(2i\,dx+2i\,c)}+a\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/6*(3*(e^(6*I*d*x + 6*I*c) + 3*e^(4*I*d*x + 4*I*c) + 3*e^(2*I*d*x + 2*I*c)
 + 1)*log(e^(I*d*x + I*c) + I) - 3*(e^(6*I*d*x + 6*I*c) + 3*e^(4*I*d*x + 4*
I*c) + 3*e^(2*I*d*x + 2*I*c) + 1)*log(e^(I*d*x + I*c) - I) - 6*I*e^(5*I*d*x
 + 5*I*c) - 16*I*e^(3*I*d*x + 3*I*c) + 6*I*e^(I*d*x + I*c))/(a*d*e^(6*I*d*x
 + 6*I*c) + 3*a*d*e^(4*I*d*x + 4*I*c) + 3*a*d*e^(2*I*d*x + 2*I*c) + a*d)
```

giac [A] time = 0.73, size = 99, normalized size = 1.65

$$\frac{\frac{3\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a}-\frac{3\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)}{a}+\frac{2\left(3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{5}+6i\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{4}-3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+2i\right)}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{2}-1\right)^{3}a}}{6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/6*(3*log(tan(1/2*d*x + 1/2*c) + 1)/a - 3*log(tan(1/2*d*x + 1/2*c) - 1)/a
+ 2*(3*tan(1/2*d*x + 1/2*c)^5 + 6*I*tan(1/2*d*x + 1/2*c)^4 - 3*tan(1/2*d*x
+ 1/2*c) + 2*I)/((tan(1/2*d*x + 1/2*c)^2 - 1)^3*a))/d
```

maple [B] time = 0.36, size = 258, normalized size = 4.30

$$\frac{i}{3ad\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^{3}}+\frac{1}{2ad\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^{2}}+\frac{i}{2ad\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^{2}}+\frac{1}{2ad\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\frac{}{2ad\left(\tan\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^5/(a+I*a*tan(d*x+c)),x)
```

```
[Out] 1/3*I/a/d/(tan(1/2*d*x+1/2*c)-1)^3+1/2/a/d/(tan(1/2*d*x+1/2*c)-1)^2+1/2*I/a
/d/(tan(1/2*d*x+1/2*c)-1)^2+1/2/a/d/(tan(1/2*d*x+1/2*c)-1)+1/2*I/a/d/(tan(1
/2*d*x+1/2*c)-1)-1/2/a/d*ln(tan(1/2*d*x+1/2*c)-1)-1/3*I/a/d/(tan(1/2*d*x+1/
2*c)+1)^3+1/2/a/d/(tan(1/2*d*x+1/2*c)+1)-1/2*I/a/d/(tan(1/2*d*x+1/2*c)+1)-1
/2/a/d/(tan(1/2*d*x+1/2*c)+1)^2+1/2*I/a/d/(tan(1/2*d*x+1/2*c)+1)^2+1/2/a/d*
ln(tan(1/2*d*x+1/2*c)+1)
```

maxima [B] time = 0.37, size = 186, normalized size = 3.10

$$\frac{\frac{4\left(\frac{3i\sin(dx+c)}{\cos(dx+c)+1}+\frac{6\sin(dx+c)^{4}}{(\cos(dx+c)+1)^{4}}-\frac{3i\sin(dx+c)^{5}}{(\cos(dx+c)+1)^{5}}+2\right)}{6i\,a-\frac{18i\,a\sin(dx+c)^{2}}{(\cos(dx+c)+1)^{2}}+\frac{18i\,a\sin(dx+c)^{4}}{(\cos(dx+c)+1)^{4}}-\frac{6i\,a\sin(dx+c)^{6}}{(\cos(dx+c)+1)^{6}}}+\frac{\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{a}-\frac{\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right)}{a}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/2*(4*(3*I*sin(d*x + c)/(cos(d*x + c) + 1) + 6*sin(d*x + c)^4/(cos(d*x + c
) + 1)^4 - 3*I*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 + 2)/(6*I*a - 18*I*a*sin
(d*x + c)^2/(cos(d*x + c) + 1)^2 + 18*I*a*sin(d*x + c)^4/(cos(d*x + c) + 1)
^4 - 6*I*a*sin(d*x + c)^6/(cos(d*x + c) + 1)^6) + log(sin(d*x + c)/(cos(d*x
 + c) + 1) + 1)/a - log(sin(d*x + c)/(cos(d*x + c) + 1) - 1)/a)/d
```

mupad [B] time = 5.38, size = 116, normalized size = 1.93

$$\frac{\operatorname{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{a\,d}+\frac{\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{a}-\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{a}+\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4\,2{}\mathrm{i}}{a}+\frac{2{}\mathrm{i}}{3\,a}}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6-3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)),x)
```

```
[Out] atanh(tan(c/2 + (d*x)/2))/(a*d) + ((tan(c/2 + (d*x)/2)^4*2i)/a + tan(c/2 +
(d*x)/2)^5/a + 2i/(3*a) - tan(c/2 + (d*x)/2)/a)/(d*(3*tan(c/2 + (d*x)/2)^2
- 3*tan(c/2 + (d*x)/2)^4 + tan(c/2 + (d*x)/2)^6 - 1))
```

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

$$-\frac{i\int\frac{\sec^5(c+dx)}{\tan(c+dx)-i}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**5/(a+I*a*tan(d*x+c)),x)
```

```
[Out] -I*Integral(sec(c + d*x)**5/(tan(c + d*x) - I), x)/a
```

3.109 $\int \frac{\sec^3(c+dx)}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=31

$$\frac{\tanh^{-1}(\sin(c+dx))}{ad}-\frac{i\sec(c+dx)}{ad}$$

```
[Out] arctanh(sin(d*x+c))/a/d-I*sec(d*x+c)/a/d
```

Rubi [A] time = 0.04, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3501, 3770}

$$\frac{\tanh^{-1}(\sin(c+dx))}{ad}-\frac{i\sec(c+dx)}{ad}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ArcTanh[Sin[c + d*x]]/(a*d) - (I*Sec[c + d*x])/(a*d)
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^3(c+dx)}{a+ia\tan(c+dx)}\,dx &= -\frac{i\sec(c+dx)}{ad}+\frac{\int \sec(c+dx)\,dx}{a}\\ &= \frac{\tanh^{-1}(\sin(c+dx))}{ad}-\frac{i\sec(c+dx)}{ad}\end{aligned}$$

Mathematica [A] time = 0.17, size = 34, normalized size = 1.10

$$\frac{2\tanh^{-1}\left(\cos(c)\tan\left(\frac{dx}{2}\right)+\sin(c)\right)-i\sec(c+dx)}{ad}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^3/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (2*ArcTanh[Sin[c] + Cos[c]*Tan[(d*x)/2]] - I*Sec[c + d*x])/(a*d)
```

fricas [B] time = 0.53, size = 80, normalized size = 2.58

$$\frac{\left(e^{(2i\,dx+2i\,c)}+1\right)\log\left(e^{(i\,dx+i\,c)}+i\right)-\left(e^{(2i\,dx+2i\,c)}+1\right)\log\left(e^{(i\,dx+i\,c)}-i\right)-2i\,e^{(i\,dx+i\,c)}}{ade^{(2i\,dx+2i\,c)}+ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

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

giac [A] time = 0.70, size = 58, normalized size = 1.87

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

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

maple [B] time = 0.35, size = 85, normalized size = 2.74

$$\frac{i}{ad\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}-\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{ad}-\frac{i}{ad\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}+\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3/(a+I*a*tan(d*x+c)),x)
```

```
[Out] I/a/d/(tan(1/2*d*x+1/2*c)-1)-1/a/d*ln(tan(1/2*d*x+1/2*c)-1)-I/a/d/(tan(1/2*
d*x+1/2*c)+1)+1/a/d*ln(tan(1/2*d*x+1/2*c)+1)
```

maxima [B] time = 0.47, size = 83, normalized size = 2.68

$$\frac{\frac{\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{a}-\frac{\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right)}{a}-\frac{2}{-i\,a+\frac{i\,a\sin(dx+c)^2}{(\cos(dx+c)+1)^2}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] (log(sin(d*x + c)/(cos(d*x + c) + 1) + 1)/a - log(sin(d*x + c)/(cos(d*x + c
) + 1) - 1)/a - 2/(-I*a + I*a*sin(d*x + c)^2/(cos(d*x + c) + 1)^2))/d
```

mupad [B] time = 3.44, size = 43, normalized size = 1.39

$$\frac{2\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{a\,d}+\frac{2\mathrm{i}}{a\,d\,\left({\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^2-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)),x)
```

```
[Out] (2*atanh(tan(c/2 + (d*x)/2)))/(a*d) + 2i/(a*d*(tan(c/2 + (d*x)/2)^2 - 1))
```

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

$$-\frac{i\int \frac{\sec^3(c+dx)}{\tan(c+dx)-i}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3/(a+I*a*tan(d*x+c)),x)
```

```
[Out] -I*Integral(sec(c + d*x)**3/(tan(c + d*x) - I), x)/a
```

3.110 $\int \frac{\sec(c+dx)}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=28

$$\frac{i\sec(c+dx)}{d(a+ia\tan(c+dx))}$$

```
[Out] I*sec(d*x+c)/d/(a+I*a*tan(d*x+c))
```

Rubi [A] time = 0.02, antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.045, Rules used = {3488}

$$\frac{i\sec(c+dx)}{d(a+ia\tan(c+dx))}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (I*Sec[c + d*x])/(d*(a + I*a*Tan[c + d*x]))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rubi steps

$$\int \frac{\sec(c+dx)}{a+ia\tan(c+dx)}\,dx = \frac{i\sec(c+dx)}{d(a+ia\tan(c+dx))}$$

Mathematica [A] time = 0.03, size = 25, normalized size = 0.89

$$\frac{\sec(c+dx)}{ad(\tan(c+dx)-i)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] Sec[c + d*x]/(a*d*(-I + Tan[c + d*x]))
```

fricas [A] time = 0.57, size = 17, normalized size = 0.61

$$\frac{i\,e^{(-i\,dx-i\,c)}}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] I*e^(-I*d*x - I*c)/(a*d)
```

giac [A] time = 0.70, size = 21, normalized size = 0.75

$$\frac{2}{ad\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] 2/(a*d*(tan(1/2*d*x + 1/2*c) - I))
```

maple [A] time = 0.20, size = 23, normalized size = 0.82

$$\frac{2}{da\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] 2/d/a/(tan(1/2*d*x+1/2*c)-I)
```

maxima [A] time = 0.71, size = 29, normalized size = 1.04

$$\frac{2}{\left(-i\,a+\frac{a\sin(dx+c)}{\cos(dx+c)+1}\right)d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] 2/((-I*a + a*sin(d*x + c)/(cos(d*x + c) + 1))*d)
```

mupad [B] time = 3.35, size = 25, normalized size = 0.89

$$\frac{2\mathrm{i}}{a\,d\,\left(1+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,1\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)*(a + a*tan(c + d*x)*1i)),x)
```

```
[Out] 2i/(a*d*(tan(c/2 + (d*x)/2)*1i + 1))
```

sympy [A] time = 0.64, size = 34, normalized size = 1.21

$$\begin{cases}\frac{\sec(c+dx)}{ad\tan(c+dx)-iad} & \text{for}\ d\neq 0\\ \frac{x\sec(c)}{ia\tan(c)+a} & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] Piecewise((sec(c + d*x)/(a*d*tan(c + d*x) - I*a*d), Ne(d, 0)), (x*sec(c)/(I
*a*tan(c) + a), True))
```

3.111 $\int \frac{\cos(c+dx)}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=47

$$\frac{2\sin(c+dx)}{3ad}+\frac{i\cos(c+dx)}{3d(a+ia\tan(c+dx))}$$

```
[Out] 2/3*sin(d*x+c)/a/d+1/3*I*cos(d*x+c)/d/(a+I*a*tan(d*x+c))
```

Rubi [A] time = 0.04, antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {3502, 2637}

$$\frac{2\sin(c+dx)}{3ad}+\frac{i\cos(c+dx)}{3d(a+ia\tan(c+dx))}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (2*Sin[c + d*x])/(3*a*d) + ((I/3)*Cos[c + d*x])/(d*(a + I*a*Tan[c + d*x]))
```

Rule 2637

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rule 3502

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

Rubi steps

$$\begin{aligned}\int \frac{\cos(c+dx)}{a+ia\tan(c+dx)}\,dx &= \frac{i\cos(c+dx)}{3d(a+ia\tan(c+dx))}+\frac{2\int \cos(c+dx)\,dx}{3a}\\ &= \frac{2\sin(c+dx)}{3ad}+\frac{i\cos(c+dx)}{3d(a+ia\tan(c+dx))}\end{aligned}$$

Mathematica [A] time = 0.13, size = 50, normalized size = 1.06

$$-\frac{\sec(c+dx)(2i\sin(2(c+dx))+\cos(2(c+dx))-3)}{6ad(\tan(c+dx)-i)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] -1/6*(Sec[c + d*x]*(-3 + Cos[2*(c + d*x)] + (2*I)*Sin[2*(c + d*x)]))/(a*d*(
-I + Tan[c + d*x]))
```

fricas [A] time = 0.52, size = 41, normalized size = 0.87

$$\frac{\left(-3i\,e^{(4i\,dx+4i\,c)}+6i\,e^{(2i\,dx+2i\,c)}+i\right)e^{(-3i\,dx-3i\,c)}}{12\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/12*(-3*I*e^(4*I*d*x + 4*I*c) + 6*I*e^(2*I*d*x + 2*I*c) + I)*e^(-3*I*d*x -
 3*I*c)/(a*d)
```

giac [A] time = 0.65, size = 67, normalized size = 1.43

$$\frac{\frac{3}{a\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+i\right)}+\frac{9\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{2}-12i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-7}{a\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)^{3}}}{6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/6*(3/(a*(tan(1/2*d*x + 1/2*c) + I)) + (9*tan(1/2*d*x + 1/2*c)^2 - 12*I*ta
n(1/2*d*x + 1/2*c) - 7)/(a*(tan(1/2*d*x + 1/2*c) - I)^3))/d
```

maple [A] time = 0.44, size = 75, normalized size = 1.60

$$\frac{\frac{2}{4\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+4i}-\frac{2}{3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{3}}+\frac{i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{2}}+\frac{3}{2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)}}{da}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] 2/d/a*(1/4/(tan(1/2*d*x+1/2*c)+I)-1/3/(tan(1/2*d*x+1/2*c)-I)^3+1/2*I/(tan(1
/2*d*x+1/2*c)-I)^2+3/4/(tan(1/2*d*x+1/2*c)-I))
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 3.55, size = 78, normalized size = 1.66

$$\frac{\left(-3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2\,3\mathrm{i}+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+1\mathrm{i}\right)\,2\mathrm{i}}{3\,a\,d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+1\mathrm{i}\right)\,{\left(1+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,1\mathrm{i}\right)}^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)/(a + a*tan(c + d*x)*1i),x)
```

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

sympy [A] time = 0.30, size = 129, normalized size = 2.74

$$\begin{cases} -\frac{\left(24ia^{2}d^{2}e^{5ic}e^{idx}-48ia^{2}d^{2}e^{3ic}e^{-idx}-8ia^{2}d^{2}e^{ic}e^{-3idx}\right)e^{-4ic}}{96a^{3}d^{3}} & \text{for}\: 96a^{3}d^{3}e^{4ic}\neq 0 \\ \frac{x\left(e^{4ic}+2e^{2ic}+1\right)e^{-3ic}}{4a} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] Piecewise((-(24*I*a**2*d**2*exp(5*I*c)*exp(I*d*x) - 48*I*a**2*d**2*exp(3*I*
c)*exp(-I*d*x) - 8*I*a**2*d**2*exp(I*c)*exp(-3*I*d*x))*exp(-4*I*c)/(96*a**3
*d**3), Ne(96*a**3*d**3*exp(4*I*c), 0)), (x*(exp(4*I*c) + 2*exp(2*I*c) + 1)
*exp(-3*I*c)/(4*a), True))
```

3.112 $\int \frac{\cos^3(c+dx)}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=67

$$-\frac{4\sin^3(c+dx)}{15ad}+\frac{4\sin(c+dx)}{5ad}+\frac{i\cos^3(c+dx)}{5d(a+ia\tan(c+dx))}$$

```
[Out] 4/5*sin(d*x+c)/a/d-4/15*sin(d*x+c)^3/a/d+1/5*I*cos(d*x+c)^3/d/(a+I*a*tan(d*
x+c))
```

Rubi [A] time = 0.05, antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3502, 2633}

$$-\frac{4\sin^3(c+dx)}{15ad}+\frac{4\sin(c+dx)}{5ad}+\frac{i\cos^3(c+dx)}{5d(a+ia\tan(c+dx))}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (4*Sin[c + d*x])/(5*a*d) - (4*Sin[c + d*x]^3)/(15*a*d) + ((I/5)*Cos[c + d*x
]^3)/(d*(a + I*a*Tan[c + d*x]))
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3502

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

Rubi steps

$$\begin{aligned}\int \frac{\cos^3(c+dx)}{a+ia\tan(c+dx)}\,dx &= \frac{i\cos^3(c+dx)}{5d(a+ia\tan(c+dx))}+\frac{4\int \cos^3(c+dx)\,dx}{5a}\\ &= \frac{i\cos^3(c+dx)}{5d(a+ia\tan(c+dx))}-\frac{4\,\text{Subst}\left(\int \left(1-x^2\right)\,dx,x,-\sin(c+dx)\right)}{5ad}\\ &= \frac{4\sin(c+dx)}{5ad}-\frac{4\sin^3(c+dx)}{15ad}+\frac{i\cos^3(c+dx)}{5d(a+ia\tan(c+dx))}\end{aligned}$$

Mathematica [A] time = 0.18, size = 72, normalized size = 1.07

$$-\frac{\sec(c+dx)(40i\sin(2(c+dx))+4i\sin(4(c+dx))+20\cos(2(c+dx))+\cos(4(c+dx))-45)}{120ad(\tan(c+dx)-i)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] -1/120*(Sec[c + d*x]*(-45 + 20*Cos[2*(c + d*x)] + Cos[4*(c + d*x)] + (40*I)
*Sin[2*(c + d*x)] + (4*I)*Sin[4*(c + d*x)]))/(a*d*(-I + Tan[c + d*x]))
```

fricas [A] time = 0.47, size = 63, normalized size = 0.94

$$\frac{\left(-5 i e^{(8 i dx+8 i c)} - 60 i e^{(6 i dx+6 i c)} + 90 i e^{(4 i dx+4 i c)} + 20 i e^{(2 i dx+2 i c)} + 3 i\right) e^{(-5 i dx-5 i c)}}{240 \, ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/240*(-5*I*e^(8*I*d*x + 8*I*c) - 60*I*e^(6*I*d*x + 6*I*c) + 90*I*e^(4*I*d*
x + 4*I*c) + 20*I*e^(2*I*d*x + 2*I*c) + 3*I)*e^(-5*I*d*x - 5*I*c)/(a*d)
```

giac [B] time = 0.65, size = 119, normalized size = 1.78

$$\frac{\frac{5 \left(15 \tan\left(\frac{1}{2} dx+\frac{1}{2} c\right)^{2}+24 i \tan\left(\frac{1}{2} dx+\frac{1}{2} c\right)-13\right)}{a \left(\tan\left(\frac{1}{2} dx+\frac{1}{2} c\right)+i\right)^{3}} + \frac{165 \tan\left(\frac{1}{2} dx+\frac{1}{2} c\right)^{4}-480 i \tan\left(\frac{1}{2} dx+\frac{1}{2} c\right)^{3}-650 \tan\left(\frac{1}{2} dx+\frac{1}{2} c\right)^{2}+400 i \tan\left(\frac{1}{2} dx+\frac{1}{2} c\right)+113}{a \left(\tan\left(\frac{1}{2} dx+\frac{1}{2} c\right)-i\right)^{5}}}{120 \, d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/120*(5*(15*tan(1/2*d*x + 1/2*c)^2 + 24*I*tan(1/2*d*x + 1/2*c) - 13)/(a*(t
an(1/2*d*x + 1/2*c) + I)^3) + (165*tan(1/2*d*x + 1/2*c)^4 - 480*I*tan(1/2*d
*x + 1/2*c)^3 - 650*tan(1/2*d*x + 1/2*c)^2 + 400*I*tan(1/2*d*x + 1/2*c) + 1
13)/(a*(tan(1/2*d*x + 1/2*c) - I)^5))/d
```

maple [B] time = 0.42, size = 141, normalized size = 2.10

$$\frac{-\frac{i}{4\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^{2}} - \frac{1}{6\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^{3}} + \frac{5}{8\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)} - \frac{i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{4}} + \frac{3i}{2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{2}} + \frac{2}{5\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{5}} - \frac{5}{3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right.}}{da}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3/(a+I*a*tan(d*x+c)),x)
```

```
[Out] 2/d/a*(-1/8*I/(tan(1/2*d*x+1/2*c)+I)^2-1/12/(tan(1/2*d*x+1/2*c)+I)^3+5/16/(
tan(1/2*d*x+1/2*c)+I)-1/2*I/(tan(1/2*d*x+1/2*c)-I)^4+3/4*I/(tan(1/2*d*x+1/2
*c)-I)^2+1/5/(tan(1/2*d*x+1/2*c)-I)^5-5/6/(tan(1/2*d*x+1/2*c)-I)^3+11/16/(t
an(1/2*d*x+1/2*c)-I))
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 4.79, size = 134, normalized size = 2.00

$$-\frac{\left(-15 \tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{7} + \tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{6} 15\mathrm{i} - 5 \tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{5} + \tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{4} 25\mathrm{i} - 13 \tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{3} + \tan\left(\frac{c}{2}+\frac{d\,x}{2}\right.\right.}{15\,a\,d \left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+1\mathrm{i}\right)^{3} \left(1+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right) 1\mathrm{i}\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3/(a + a*tan(c + d*x)*1i),x)
```

```
[Out] -((9*tan(c/2 + (d*x)/2) + tan(c/2 + (d*x)/2)^2*21i - 13*tan(c/2 + (d*x)/2)^
3 + tan(c/2 + (d*x)/2)^4*25i - 5*tan(c/2 + (d*x)/2)^5 + tan(c/2 + (d*x)/2)^
6*15i - 15*tan(c/2 + (d*x)/2)^7 + 3i)*2i)/(15*a*d*(tan(c/2 + (d*x)/2) + 1i)
^3*(tan(c/2 + (d*x)/2)*1i + 1)^5)
```

sympy [A] time = 0.47, size = 199, normalized size = 2.97

$$\begin{cases} -\frac{\left(30720ia^4d^4e^{12ic}e^{3idx}+368640ia^4d^4e^{10ic}e^{idx}-552960ia^4d^4e^{8ic}e^{-idx}-122880ia^4d^4e^{6ic}e^{-3idx}-18432ia^4d^4e^{4ic}e^{-5idx}\right)e^{-9ic}}{1474560a^5d^5} & \text{for } 1474560a^5d^5 \\ \frac{x\left(e^{8ic}+4e^{6ic}+6e^{4ic}+4e^{2ic}+1\right)e^{-5ic}}{16a} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3/(a+I*a*tan(d*x+c)),x)
```

```
[Out] Piecewise((-(30720*I*a**4*d**4*exp(12*I*c)*exp(3*I*d*x) + 368640*I*a**4*d**
4*exp(10*I*c)*exp(I*d*x) - 552960*I*a**4*d**4*exp(8*I*c)*exp(-I*d*x) - 1228
80*I*a**4*d**4*exp(6*I*c)*exp(-3*I*d*x) - 18432*I*a**4*d**4*exp(4*I*c)*exp(
-5*I*d*x))*exp(-9*I*c)/(1474560*a**5*d**5), Ne(1474560*a**5*d**5*exp(9*I*c)
, 0)), (x*(exp(8*I*c) + 4*exp(6*I*c) + 6*exp(4*I*c) + 4*exp(2*I*c) + 1)*exp
(-5*I*c)/(16*a), True))
```

3.113 $\int \frac{\cos^5(c+dx)}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=85

$$\frac{6\sin^5(c+dx)}{35ad}-\frac{4\sin^3(c+dx)}{7ad}+\frac{6\sin(c+dx)}{7ad}+\frac{i\cos^5(c+dx)}{7d(a+ia\tan(c+dx))}$$

```
[Out] 6/7*sin(d*x+c)/a/d-4/7*sin(d*x+c)^3/a/d+6/35*sin(d*x+c)^5/a/d+1/7*I*cos(d*x
+c)^5/d/(a+I*a*tan(d*x+c))
```

Rubi [A] time = 0.06, antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3502, 2633}

$$\frac{6\sin^5(c+dx)}{35ad}-\frac{4\sin^3(c+dx)}{7ad}+\frac{6\sin(c+dx)}{7ad}+\frac{i\cos^5(c+dx)}{7d(a+ia\tan(c+dx))}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^5/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (6*Sin[c + d*x])/(7*a*d) - (4*Sin[c + d*x]^3)/(7*a*d) + (6*Sin[c + d*x]^5)/
(35*a*d) + ((I/7)*Cos[c + d*x]^5)/(d*(a + I*a*Tan[c + d*x]))
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3502

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

Rubi steps

$$\begin{aligned}\int \frac{\cos^5(c+dx)}{a+ia\tan(c+dx)}\,dx &= \frac{i\cos^5(c+dx)}{7d(a+ia\tan(c+dx))}+\frac{6\int \cos^5(c+dx)\,dx}{7a}\\ &= \frac{i\cos^5(c+dx)}{7d(a+ia\tan(c+dx))}-\frac{6\,\text{Subst}\left(\int \left(1-2x^2+x^4\right)\,dx,x,-\sin(c+dx)\right)}{7ad}\\ &= \frac{6\sin(c+dx)}{7ad}-\frac{4\sin^3(c+dx)}{7ad}+\frac{6\sin^5(c+dx)}{35ad}+\frac{i\cos^5(c+dx)}{7d(a+ia\tan(c+dx))}\end{aligned}$$

Mathematica [A] time = 0.23, size = 94, normalized size = 1.11

$$-\frac{\sec(c+dx)(350i\sin(2(c+dx))+56i\sin(4(c+dx))+6i\sin(6(c+dx))+175\cos(2(c+dx))+14\cos(4(c+dx)}{1120ad(\tan(c+dx)-i)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^5/(a + I*a*Tan[c + d*x]),x]
```

[Out] -1/1120*(Sec[c + d*x]*(-350 + 175*Cos[2*(c + d*x)] + 14*Cos[4*(c + d*x)] + Cos[6*(c + d*x)] + (350*I)*Sin[2*(c + d*x)] + (56*I)*Sin[4*(c + d*x)] + (6*I)*Sin[6*(c + d*x)]))/(a*d*(-I + Tan[c + d*x]))

fricas [A] time = 0.56, size = 85, normalized size = 1.00

$$\frac{\left(-7i\,e^{(12i\,dx+12i\,c)} - 70i\,e^{(10i\,dx+10i\,c)} - 525i\,e^{(8i\,dx+8i\,c)} + 700i\,e^{(6i\,dx+6i\,c)} + 175i\,e^{(4i\,dx+4i\,c)} + 42i\,e^{(2i\,dx+2i\,c)} + 5i\right)e^{(-7}}{2240\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(cos(d*x+c)^5/(a+I*a*tan(d*x+c)),x, algorithm="fricas")

[Out] 1/2240*(-7*I*e^(12*I*d*x + 12*I*c) - 70*I*e^(10*I*d*x + 10*I*c) - 525*I*e^(8*I*d*x + 8*I*c) + 700*I*e^(6*I*d*x + 6*I*c) + 175*I*e^(4*I*d*x + 4*I*c) + 42*I*e^(2*I*d*x + 2*I*c) + 5*I)*e^(-7*I*d*x - 7*I*c)/(a*d)

giac [B] time = 0.71, size = 171, normalized size = 2.01

$$\frac{\frac{7\left(55\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^4+180i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-250\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-160i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+43\right)}{a\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+i\right)^5}+\frac{735\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^6-3360i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5-731}{}}{560\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(cos(d*x+c)^5/(a+I*a*tan(d*x+c)),x, algorithm="giac")

[Out] 1/560*(7*(55*tan(1/2*d*x + 1/2*c)^4 + 180*I*tan(1/2*d*x + 1/2*c)^3 - 250*tan(1/2*d*x + 1/2*c)^2 - 160*I*tan(1/2*d*x + 1/2*c) + 43)/(a*(tan(1/2*d*x + 1/2*c) + I)^5) + (735*tan(1/2*d*x + 1/2*c)^6 - 3360*I*tan(1/2*d*x + 1/2*c)^5 - 7315*tan(1/2*d*x + 1/2*c)^4 + 8820*I*tan(1/2*d*x + 1/2*c)^3 + 6321*tan(1/2*d*x + 1/2*c)^2 - 2492*I*tan(1/2*d*x + 1/2*c) - 461)/(a*(tan(1/2*d*x + 1/2*c) - I)^7))/d

maple [B] time = 0.47, size = 207, normalized size = 2.44

$$\frac{\frac{i}{4\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^4}-\frac{i}{2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^2}+\frac{1}{10\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^5}-\frac{1}{2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^3}+\frac{11}{16\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)}-\frac{2}{7\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^7}+\frac{i}{\left(\tan\left(\frac{dx}{2}+\right.\right.}}{da}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(cos(d*x+c)^5/(a+I*a*tan(d*x+c)),x)

[Out] 2/d/a*(1/8*I/(tan(1/2*d*x+1/2*c)+I)^4-1/4*I/(tan(1/2*d*x+1/2*c)+I)^2+1/20/(tan(1/2*d*x+1/2*c)+I)^5-1/4/(tan(1/2*d*x+1/2*c)+I)^3+11/32/(tan(1/2*d*x+1/2*c)+I)-1/7/(tan(1/2*d*x+1/2*c)-I)^7+1/2*I/(tan(1/2*d*x+1/2*c)-I)^6+15/16*I/(tan(1/2*d*x+1/2*c)-I)^2-11/8*I/(tan(1/2*d*x+1/2*c)-I)^4+21/20/(tan(1/2*d*x+1/2*c)-I)^5-11/8/(tan(1/2*d*x+1/2*c)-I)^3+21/32/(tan(1/2*d*x+1/2*c)-I))

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(cos(d*x+c)^5/(a+I*a*tan(d*x+c)),x, algorithm="maxima")

[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima: expt: undefined: 0 to a negative exponent.

mupad [B] time = 7.10, size = 188, normalized size = 2.21

$$\frac{\left(-35\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{11}+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}35\mathrm{i}-35\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{9}+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{8}105\mathrm{i}-126\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{7}+\tan\left(\frac{c}{2}\right.\right.}{35\,a\,d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^5/(a + a*tan(c + d*x)*1i),x)
```

```
[Out] ((25*tan(c/2 + (d*x)/2) + tan(c/2 + (d*x)/2)^2*55i - 15*tan(c/2 + (d*x)/2)^
3 + tan(c/2 + (d*x)/2)^4*130i + 26*tan(c/2 + (d*x)/2)^5 + tan(c/2 + (d*x)/2
)^6*182i - 126*tan(c/2 + (d*x)/2)^7 + tan(c/2 + (d*x)/2)^8*105i - 35*tan(c/
2 + (d*x)/2)^9 + tan(c/2 + (d*x)/2)^10*35i - 35*tan(c/2 + (d*x)/2)^11 + 5i)
*2i)/(35*a*d*(tan(c/2 + (d*x)/2) + 1i)^5*(tan(c/2 + (d*x)/2)*1i + 1)^7)
```

sympy [A] time = 0.64, size = 267, normalized size = 3.14

$$\begin{cases} -\frac{\left(150323855360ia^6d^6e^{21ic}e^{5idx}+1503238553600ia^6d^6e^{19ic}e^{3idx}+11274289152000ia^6d^6e^{17ic}e^{idx}-15032385536000ia^6d^6e^{15ic}e^{-idx}-3758096384000ia^6\right.}{48103633715200a^7d^7} \\ \frac{x\left(e^{12ic}+6e^{10ic}+15e^{8ic}+20e^{6ic}+15e^{4ic}+6e^{2ic}+1\right)e^{-7ic}}{64a} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**5/(a+I*a*tan(d*x+c)),x)
```

```
[Out] Piecewise((-(150323855360*I*a**6*d**6*exp(21*I*c)*exp(5*I*d*x) + 1503238553
600*I*a**6*d**6*exp(19*I*c)*exp(3*I*d*x) + 11274289152000*I*a**6*d**6*exp(1
7*I*c)*exp(I*d*x) - 15032385536000*I*a**6*d**6*exp(15*I*c)*exp(-I*d*x) - 37
58096384000*I*a**6*d**6*exp(13*I*c)*exp(-3*I*d*x) - 901943132160*I*a**6*d**
6*exp(11*I*c)*exp(-5*I*d*x) - 107374182400*I*a**6*d**6*exp(9*I*c)*exp(-7*I*
d*x))*exp(-16*I*c)/(48103633715200*a**7*d**7), Ne(48103633715200*a**7*d**7*
exp(16*I*c), 0)), (x*(exp(12*I*c) + 6*exp(10*I*c) + 15*exp(8*I*c) + 20*exp(
6*I*c) + 15*exp(4*I*c) + 6*exp(2*I*c) + 1)*exp(-7*I*c)/(64*a), True))
```

3.114 $\int \frac{\sec^{10}(c+dx)}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=82

$$\frac{i(a-ia\tan(c+dx))^7}{7a^9d}-\frac{2i(a-ia\tan(c+dx))^6}{3a^8d}+\frac{4i(a-ia\tan(c+dx))^5}{5a^7d}$$

```
[Out] 4/5*I*(a-I*a*tan(d*x+c))^5/a^7/d-2/3*I*(a-I*a*tan(d*x+c))^6/a^8/d+1/7*I*(a-
I*a*tan(d*x+c))^7/a^9/d
```

Rubi [A] time = 0.06, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{i(a-ia\tan(c+dx))^7}{7a^9d}-\frac{2i(a-ia\tan(c+dx))^6}{3a^8d}+\frac{4i(a-ia\tan(c+dx))^5}{5a^7d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^10/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (((4*I)/5)*(a - I*a*Tan[c + d*x])^5)/(a^7*d) - (((2*I)/3)*(a - I*a*Tan[c +
d*x])^6)/(a^8*d) + ((I/7)*(a - I*a*Tan[c + d*x])^7)/(a^9*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^{10}(c+dx)}{(a+ia\tan(c+dx))^2}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^4(a+x)^2\,dx,x,ia\tan(c+dx)\right)}{a^9d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(4a^2(a-x)^4-4a(a-x)^5+(a-x)^6\right)dx,x,ia\tan(c+dx)\right)}{a^9d}\\ &= \frac{4i(a-ia\tan(c+dx))^5}{5a^7d}-\frac{2i(a-ia\tan(c+dx))^6}{3a^8d}+\frac{i(a-ia\tan(c+dx))^7}{7a^9d}\end{aligned}$$

Mathematica [A] time = 0.55, size = 90, normalized size = 1.10

$$\frac{\sec(c)\sec^7(c+dx)(-35\sin(2c+dx)+42\sin(2c+3dx)+14\sin(4c+5dx)+2\sin(6c+7dx)-35i\cos(2c+d}{210a^2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^10/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (Sec[c]*Sec[c + d*x]^7*((-35*I)*Cos[d*x] - (35*I)*Cos[2*c + d*x] + 35*Sin[d
*x] - 35*Sin[2*c + d*x] + 42*Sin[2*c + 3*d*x] + 14*Sin[4*c + 5*d*x] + 2*Sin
[6*c + 7*d*x]))/(210*a^2*d)
```

fricas [B] time = 0.50, size = 138, normalized size = 1.68

$$\frac{2688i\,e^{(4i\,dx+4i\,c)} + 896i\,e^{(2i\,dx+2i\,c)} + 128i}{105\left(a^2de^{(14i\,dx+14i\,c)} + 7\,a^2de^{(12i\,dx+12i\,c)} + 21\,a^2de^{(10i\,dx+10i\,c)} + 35\,a^2de^{(8i\,dx+8i\,c)} + 35\,a^2de^{(6i\,dx+6i\,c)} + 21\,a^2de^{(4i\,dx+4}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/105*(2688*I*e^(4*I*d*x + 4*I*c) + 896*I*e^(2*I*d*x + 2*I*c) + 128*I)/(a^2
*d*e^(14*I*d*x + 14*I*c) + 7*a^2*d*e^(12*I*d*x + 12*I*c) + 21*a^2*d*e^(10*I
*d*x + 10*I*c) + 35*a^2*d*e^(8*I*d*x + 8*I*c) + 35*a^2*d*e^(6*I*d*x + 6*I*c
) + 21*a^2*d*e^(4*I*d*x + 4*I*c) + 7*a^2*d*e^(2*I*d*x + 2*I*c) + a^2*d)
```

giac [A] time = 1.03, size = 77, normalized size = 0.94

$$-\frac{15\,\tan\left(dx+c\right)^7 + 35i\,\tan\left(dx+c\right)^6 + 21\,\tan\left(dx+c\right)^5 + 105i\,\tan\left(dx+c\right)^4 - 35\,\tan\left(dx+c\right)^3 + 105i\,\tan\left(dx+\right.}{105\,a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -1/105*(15*tan(d*x + c)^7 + 35*I*tan(d*x + c)^6 + 21*tan(d*x + c)^5 + 105*I
*tan(d*x + c)^4 - 35*tan(d*x + c)^3 + 105*I*tan(d*x + c)^2 - 105*tan(d*x +
c))/(a^2*d)
```

maple [A] time = 0.41, size = 78, normalized size = 0.95

$$\frac{\tan\left(dx+c\right) - \frac{\left(\tan^7(dx+c)\right)}{7} - \frac{i\left(\tan^6(dx+c)\right)}{3} - \frac{\left(\tan^5(dx+c)\right)}{5} - i\left(\tan^4\left(dx+c\right)\right) + \frac{\left(\tan^3(dx+c)\right)}{3} - i\left(\tan^2\left(dx+c\right)\right)}{d\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 1/d/a^2*(tan(d*x+c)-1/7*tan(d*x+c)^7-1/3*I*tan(d*x+c)^6-1/5*tan(d*x+c)^5-I*
tan(d*x+c)^4+1/3*tan(d*x+c)^3-I*tan(d*x+c)^2)
```

maxima [A] time = 0.37, size = 77, normalized size = 0.94

$$-\frac{15\,\tan\left(dx+c\right)^7 + 35i\,\tan\left(dx+c\right)^6 + 21\,\tan\left(dx+c\right)^5 + 105i\,\tan\left(dx+c\right)^4 - 35\,\tan\left(dx+c\right)^3 + 105i\,\tan\left(dx+\right.}{105\,a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/105*(15*tan(d*x + c)^7 + 35*I*tan(d*x + c)^6 + 21*tan(d*x + c)^5 + 105*I
*tan(d*x + c)^4 - 35*tan(d*x + c)^3 + 105*I*tan(d*x + c)^2 - 105*tan(d*x +
c))/(a^2*d)
```

mupad [B] time = 3.46, size = 93, normalized size = 1.13

$$\frac{\cos\left(c+d\,x\right)^7\,35\mathrm{i} + 64\,\sin\left(c+d\,x\right)\,\cos\left(c+d\,x\right)^6 + 32\,\sin\left(c+d\,x\right)\,\cos\left(c+d\,x\right)^4 + 24\,\sin\left(c+d\,x\right)\,\cos\left(c+d\,x\right)}{105\,a^2\,d\cos\left(c+d\,x\right)^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^10*(a + a*tan(c + d*x)*1i)^2),x)
```

```
[Out] (24*cos(c + d*x)^2*sin(c + d*x) - 15*sin(c + d*x) - cos(c + d*x)*35i + 32*c
os(c + d*x)^4*sin(c + d*x) + 64*cos(c + d*x)^6*sin(c + d*x) + cos(c + d*x)^
7*35i)/(105*a^2*d*cos(c + d*x)^7)
```

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

$$-\frac{\int \frac{\sec^{10}(c+dx)}{\tan^2(c+dx)-2i\tan(c+dx)-1}\,dx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**10/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -Integral(sec(c + d*x)**10/(tan(c + d*x)**2 - 2*I*tan(c + d*x) - 1), x)/a**
2
```

3.115 $\int \frac{\sec^8(c+dx)}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=55

$$\frac{i(a-ia\tan(c+dx))^4}{2a^6d}-\frac{i(a-ia\tan(c+dx))^5}{5a^7d}$$

[Out] 1/2*I*(a-I*a*tan(d*x+c))^4/a^6/d-1/5*I*(a-I*a*tan(d*x+c))^5/a^7/d

Rubi [A] time = 0.05, antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{i(a-ia\tan(c+dx))^4}{2a^6d}-\frac{i(a-ia\tan(c+dx))^5}{5a^7d}$$

Antiderivative was successfully verified.

[In] Int[Sec[c + d*x]^8/(a + I*a*Tan[c + d*x])^2,x]

[Out] ((I/2)*(a - I*a*Tan[c + d*x])^4)/(a^6*d) - ((I/5)*(a - I*a*Tan[c + d*x])^5)/(a^7*d)

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^8(c+dx)}{(a+ia\tan(c+dx))^2}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^3(a+x)\,dx, x, ia\tan(c+dx)\right)}{a^7d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(2a(a-x)^3-(a-x)^4\right)\,dx, x, ia\tan(c+dx)\right)}{a^7d}\\ &= \frac{i(a-ia\tan(c+dx))^4}{2a^6d}-\frac{i(a-ia\tan(c+dx))^5}{5a^7d}\end{aligned}$$

Mathematica [A] time = 0.42, size = 77, normalized size = 1.40

$$\frac{\sec(c)\sec^5(c+dx)(-5\sin(2c+dx)+5\sin(2c+3dx)+\sin(4c+5dx)-5i\cos(2c+dx)+5\sin(dx)-5i\cos(dx))}{20a^2d}$$

Antiderivative was successfully verified.

[In] Integrate[Sec[c + d*x]^8/(a + I*a*Tan[c + d*x])^2,x]

[Out] (Sec[c]*Sec[c + d*x]^5*((-5*I)*Cos[d*x] - (5*I)*Cos[2*c + d*x] + 5*Sin[d*x] - 5*Sin[2*c + d*x] + 5*Sin[2*c + 3*d*x] + Sin[4*c + 5*d*x]))/(20*a^2*d)

fricas [B] time = 0.41, size = 97, normalized size = 1.76

$$\frac{40i\,e^{(2i\,dx+2i\,c)}+8i}{5\left(a^2de^{(10i\,dx+10i\,c)}+5\,a^2de^{(8i\,dx+8i\,c)}+10\,a^2de^{(6i\,dx+6i\,c)}+10\,a^2de^{(4i\,dx+4i\,c)}+5\,a^2de^{(2i\,dx+2i\,c)}+a^2d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/5*(40*I*e^(2*I*d*x + 2*I*c) + 8*I)/(a^2*d*e^(10*I*d*x + 10*I*c) + 5*a^2*d
*e^(8*I*d*x + 8*I*c) + 10*a^2*d*e^(6*I*d*x + 6*I*c) + 10*a^2*d*e^(4*I*d*x +
 4*I*c) + 5*a^2*d*e^(2*I*d*x + 2*I*c) + a^2*d)
```

giac [A] time = 0.85, size = 47, normalized size = 0.85

$$-\frac{2\tan(dx+c)^5+5i\tan(dx+c)^4+10i\tan(dx+c)^2-10\tan(dx+c)}{10\,a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -1/10*(2*tan(d*x + c)^5 + 5*I*tan(d*x + c)^4 + 10*I*tan(d*x + c)^2 - 10*tan
(d*x + c))/(a^2*d)
```

maple [A] time = 0.35, size = 47, normalized size = 0.85

$$\frac{\tan(dx+c)-\frac{\left(\tan^5(dx+c)\right)}{5}-\frac{i\left(\tan^4(dx+c)\right)}{2}-i\left(\tan^2(dx+c)\right)}{d\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 1/d/a^2*(tan(d*x+c)-1/5*tan(d*x+c)^5-1/2*I*tan(d*x+c)^4-I*tan(d*x+c)^2)
```

maxima [A] time = 0.32, size = 47, normalized size = 0.85

$$-\frac{2\tan(dx+c)^5+5i\tan(dx+c)^4+10i\tan(dx+c)^2-10\tan(dx+c)}{10\,a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/10*(2*tan(d*x + c)^5 + 5*I*tan(d*x + c)^4 + 10*I*tan(d*x + c)^2 - 10*tan
(d*x + c))/(a^2*d)
```

mupad [B] time = 3.36, size = 77, normalized size = 1.40

$$-\frac{\sin(c+d\,x)\,\left(-10\cos(c+d\,x)^4+\cos(c+d\,x)^3\,\sin(c+d\,x)\,10\mathrm{i}+\cos(c+d\,x)\,\sin(c+d\,x)^3\,5\mathrm{i}+2\sin(c+\right.}{10\,a^2\,d\cos(c+d\,x)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^8*(a + a*tan(c + d*x)*1i)^2),x)
```

```
[Out] -(sin(c + d*x)*(cos(c + d*x)*sin(c + d*x)^3*5i + cos(c + d*x)^3*sin(c + d*x
)*10i - 10*cos(c + d*x)^4 + 2*sin(c + d*x)^4))/(10*a^2*d*cos(c + d*x)^5)
```

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

$$-\frac{\int\frac{\sec^8(c+dx)}{\tan^2(c+dx)-2i\tan(c+dx)-1}\,dx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -Integral(sec(c + d*x)**8/(tan(c + d*x)**2 - 2*I*tan(c + d*x) - 1), x)/a**2
```

3.116 $\int \frac{\sec^6(c+dx)}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=27

$$\frac{i(a-ia\tan(c+dx))^3}{3a^5d}$$

```
[Out] 1/3*I*(a-I*a*tan(d*x+c))^3/a^5/d
```

Rubi [A] time = 0.04, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 32}

$$\frac{i(a-ia\tan(c+dx))^3}{3a^5d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] ((I/3)*(a - I*a*Tan[c + d*x])^3)/(a^5*d)
```

Rule 32

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^6(c+dx)}{(a+ia\tan(c+dx))^2}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^2\,dx,x,ia\tan(c+dx)\right)}{a^5d}\\ &= \frac{i(a-ia\tan(c+dx))^3}{3a^5d}\end{aligned}$$

Mathematica [B] time = 0.24, size = 68, normalized size = 2.52

$$\frac{\sec(c)\sec^3(c+dx)(-3\sin(2c+dx)+2\sin(2c+3dx)-3i\cos(2c+dx)+3\sin(dx)-3i\cos(dx))}{6a^2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (Sec[c]*Sec[c + d*x]^3*((-3*I)*Cos[d*x] - (3*I)*Cos[2*c + d*x] + 3*Sin[d*x]
 - 3*Sin[2*c + d*x] + 2*Sin[2*c + 3*d*x]))/(6*a^2*d)
```

fricas [B] time = 0.45, size = 54, normalized size = 2.00

$$\frac{8i}{3\left(a^2de^{(6i\,dx+6i\,c)}+3\,a^2de^{(4i\,dx+4i\,c)}+3\,a^2de^{(2i\,dx+2i\,c)}+a^2d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 8/3*I/(a^2*d*e^(6*I*d*x + 6*I*c) + 3*a^2*d*e^(4*I*d*x + 4*I*c) + 3*a^2*d*e^
(2*I*d*x + 2*I*c) + a^2*d)
```

giac [A] time = 0.99, size = 35, normalized size = 1.30

$$-\frac{\tan(dx+c)^3 + 3i\tan(dx+c)^2 - 3\tan(dx+c)}{3a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

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

maple [A] time = 0.36, size = 36, normalized size = 1.33

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^2,x)
```

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

maxima [A] time = 0.38, size = 35, normalized size = 1.30

$$-\frac{\tan(dx+c)^3 + 3i\tan(dx+c)^2 - 3\tan(dx+c)}{3a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

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

mupad [B] time = 3.34, size = 33, normalized size = 1.22

$$-\frac{\tan(c+d\,x)\,\left(\tan(c+d\,x)^2 + \tan(c+d\,x)\,3\mathrm{i} - 3\right)}{3\,a^2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^2),x)
```

```
[Out] -(tan(c + d*x)*(tan(c + d*x)*3i + tan(c + d*x)^2 - 3))/(3*a^2*d)
```

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

$$-\frac{\int \frac{\sec^6(c+dx)}{\tan^2(c+dx) - 2i\tan(c+dx) - 1}\,dx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -Integral(sec(c + d*x)**6/(tan(c + d*x)**2 - 2*I*tan(c + d*x) - 1), x)/a**2
```

3.117 $\int \frac{\sec^4(c+dx)}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=38

$$-\frac{\tan(c+dx)}{a^2d}+\frac{2i\log(\cos(c+dx))}{a^2d}+\frac{2x}{a^2}$$

```
[Out] 2*x/a^2+2*I*ln(cos(d*x+c))/a^2/d-tan(d*x+c)/a^2/d
```

Rubi [A] time = 0.05, antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$-\frac{\tan(c+dx)}{a^2d}+\frac{2i\log(\cos(c+dx))}{a^2d}+\frac{2x}{a^2}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (2*x)/a^2 + ((2*I)*Log[Cos[c + d*x]])/(a^2*d) - Tan[c + d*x]/(a^2*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^4(c+dx)}{(a+ia\tan(c+dx))^2}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{a-x}{a+x}\,dx, x, ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(-1+\frac{2a}{a+x}\right)dx, x, ia\tan(c+dx)\right)}{a^3d}\\ &= \frac{2x}{a^2}+\frac{2i\log(\cos(c+dx))}{a^2d}-\frac{\tan(c+dx)}{a^2d}\end{aligned}$$

Mathematica [A] time = 0.44, size = 71, normalized size = 1.87

$$\frac{4\tan^{-1}(\tan(dx))+i\sec(c)\sec(c+dx)\left(\cos(dx)\log\left(\cos^2(c+dx)\right)+\cos(2c+dx)\log\left(\cos^2(c+dx)\right)+2i\sin(\right.}{2a^2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (4*ArcTan[Tan[d*x]] + I*Sec[c]*Sec[c + d*x]*(Cos[d*x]*Log[Cos[c + d*x]^2] +
 Cos[2*c + d*x]*Log[Cos[c + d*x]^2] + (2*I)*Sin[d*x]))/(2*a^2*d)
```

fricas [A] time = 0.50, size = 68, normalized size = 1.79

$$\frac{4\,dxe^{(2i\,dx+2i\,c)}+4\,dx+\left(2i\,e^{(2i\,dx+2i\,c)}+2i\right)\log\left(e^{(2i\,dx+2i\,c)}+1\right)-2i}{a^2de^{(2i\,dx+2i\,c)}+a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

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

giac [B] time = 0.98, size = 100, normalized size = 2.63

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 2*(I*log(tan(1/2*d*x + 1/2*c) + 1)/a^2 - 2*I*log(tan(1/2*d*x + 1/2*c) - I)/
a^2 + I*log(tan(1/2*d*x + 1/2*c) - 1)/a^2 + (-I*tan(1/2*d*x + 1/2*c)^2 + ta
n(1/2*d*x + 1/2*c) + I)/((tan(1/2*d*x + 1/2*c)^2 - 1)*a^2))/d
```

maple [A] time = 0.36, size = 35, normalized size = 0.92

$$-\frac{2i\ln\left(\tan\left(dx+c\right)-i\right)}{a^2d}-\frac{\tan\left(dx+c\right)}{a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] -2*I/a^2/d*ln(tan(d*x+c)-I)-tan(d*x+c)/a^2/d
```

maxima [A] time = 0.32, size = 32, normalized size = 0.84

$$\frac{-\frac{2i\log\left(i\tan\left(dx+c\right)+1\right)}{a^2}-\frac{\tan\left(dx+c\right)}{a^2}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

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

mupad [B] time = 3.35, size = 28, normalized size = 0.74

$$-\frac{\tan\left(c+d\,x\right)+\ln\left(\tan\left(c+d\,x\right)-\mathrm{i}\right)\,2\mathrm{i}}{a^2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^2),x)
```

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

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

$$-\frac{\int\frac{\sec^4\left(c+dx\right)}{\tan^2\left(c+dx\right)-2i\tan\left(c+dx\right)-1}\,dx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -Integral(sec(c + d*x)**4/(tan(c + d*x)**2 - 2*I*tan(c + d*x) - 1), x)/a**2
```

3.118 $\int \frac{\sec^2(c+dx)}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=26

$$\frac{i}{d\left(a^2+ia^2\tan(c+dx)\right)}$$

```
[Out] I/d/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.04, antiderivative size = 26, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 32}

$$\frac{i}{d\left(a^2+ia^2\tan(c+dx)\right)}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] I/(d*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 32

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^2(c+dx)}{(a+ia\tan(c+dx))^2}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{1}{(a+x)^2}\,dx, x, ia\tan(c+dx)\right)}{ad}\\ &= \frac{i}{d\left(a^2+ia^2\tan(c+dx)\right)}\end{aligned}$$

Mathematica [A] time = 0.06, size = 32, normalized size = 1.23

$$\frac{i\sec^2(c+dx)}{2d(a+ia\tan(c+dx))^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] ((I/2)*Sec[c + d*x]^2)/(d*(a + I*a*Tan[c + d*x])^2)
```

fricas [A] time = 0.50, size = 17, normalized size = 0.65

$$\frac{i\,e^{(-2i\,dx-2i\,c)}}{2\,a^2 d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

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

giac [A] time = 0.85, size = 30, normalized size = 1.15

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -2*tan(1/2*d*x + 1/2*c)/(a^2*d*(tan(1/2*d*x + 1/2*c) - I)^2)
```

maple [A] time = 0.27, size = 24, normalized size = 0.92

$$\frac{i}{ad\left(a+ia\tan\left(dx+c\right)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] I/a/d/(a+I*a*tan(d*x+c))
```

maxima [A] time = 0.32, size = 21, normalized size = 0.81

$$\frac{i}{\left(i\,a\tan\left(dx+c\right)+a\right)ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] I/((I*a*tan(d*x + c) + a)*a*d)
```

mupad [B] time = 3.34, size = 22, normalized size = 0.85

$$\frac{1\mathrm{i}}{a^2\,d\,\left(1+\tan\left(c+d\,x\right)\,1\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^2),x)
```

```
[Out] 1i/(a^2*d*(tan(c + d*x)*1i + 1))
```

sympy [A] time = 1.18, size = 65, normalized size = 2.50

$$\begin{cases} -\frac{i\sec^2\left(c+dx\right)}{2a^2d\tan^2\left(c+dx\right)-4ia^2d\tan\left(c+dx\right)-2a^2d} & \text{for}\ d\neq 0 \\ \frac{x\sec^2\left(c\right)}{\left(ia\tan\left(c\right)+a\right)^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Piecewise((-I*sec(c + d*x)**2/(2*a**2*d*tan(c + d*x)**2 - 4*I*a**2*d*tan(c
+ d*x) - 2*a**2*d), Ne(d, 0)), (x*sec(c)**2/(I*a*tan(c) + a)**2, True))
```

3.119 $\int \frac{1}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=61

$$\frac{i}{4d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{x}{4a^2}+\frac{i}{4d(a+ia\tan(c+dx))^2}$$

```
[Out] 1/4*x/a^2+1/4*I/d/(a+I*a*tan(d*x+c))^2+1/4*I/d/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.03, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {3479, 8}

$$\frac{i}{4d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{x}{4a^2}+\frac{i}{4d(a+ia\tan(c+dx))^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^(-2),x]
```

```
[Out] x/(4*a^2) + (I/4)/(d*(a + I*a*Tan[c + d*x])^2) + (I/4)/(d*(a^2 + I*a^2*Tan[
c + d*x]))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 3479

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

Rubi steps

$$\begin{aligned}
\int \frac{1}{(a+ia\tan(c+dx))^2}\,dx &= \frac{i}{4d(a+ia\tan(c+dx))^2}+\frac{\int \frac{1}{a+ia\tan(c+dx)}\,dx}{2a}\\
&= \frac{i}{4d(a+ia\tan(c+dx))^2}+\frac{i}{4d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{\int 1\,dx}{4a^2}\\
&= \frac{x}{4a^2}+\frac{i}{4d(a+ia\tan(c+dx))^2}+\frac{i}{4d\left(a^2+ia^2\tan(c+dx)\right)}
\end{aligned}$$

Mathematica [A] time = 0.22, size = 68, normalized size = 1.11

$$-\frac{\sec^2(c+dx)((1+4idx)\sin(2(c+dx))+(4dx+i)\cos(2(c+dx))+4i)}{16a^2d(\tan(c+dx)-i)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^(-2),x]
```

```
[Out] -1/16*(Sec[c + d*x]^2*(4*I + (I + 4*d*x)*Cos[2*(c + d*x)] + (1 + (4*I)*d*x)
*Sin[2*(c + d*x)]))/(a^2*d*(-I + Tan[c + d*x])^2)
```

fricas [**A**] time = 0.53, size = 43, normalized size = 0.70

$$\frac{\left(4\,dxe^{(4i\,dx+4i\,c)}+4i\,e^{(2i\,dx+2i\,c)}+i\right)e^{(-4i\,dx-4i\,c)}}{16\,a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/16*(4*d*x*e^(4*I*d*x + 4*I*c) + 4*I*e^(2*I*d*x + 2*I*c) + I)*e^(-4*I*d*x
- 4*I*c)/(a^2*d)
```

giac [**A**] time = 0.54, size = 72, normalized size = 1.18

$$-\frac{\frac{2i\,\log(i\,\tan(dx+c)+1)}{a^2}-\frac{2i\,\log(i\,\tan(dx+c)-1)}{a^2}+\frac{-3i\,\tan(dx+c)^2-10\,\tan(dx+c)+11i}{a^2(\tan(dx+c)-i)^2}}{16\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/16*(2*I*log(I*tan(d*x + c) + 1)/a^2 - 2*I*log(I*tan(d*x + c) - 1)/a^2 +
(-3*I*tan(d*x + c)^2 - 10*tan(d*x + c) + 11*I)/(a^2*(tan(d*x + c) - I)^2))/
d
```

maple [**A**] time = 0.10, size = 79, normalized size = 1.30

$$\frac{i\ln\left(\tan\left(dx+c\right)+i\right)}{8d\,a^2}-\frac{i\ln\left(\tan\left(dx+c\right)-i\right)}{8a^2d}-\frac{i}{4d\,a^2\left(\tan\left(dx+c\right)-i\right)^2}+\frac{1}{4d\,a^2\left(\tan\left(dx+c\right)-i\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/8*I/d/a^2*ln(tan(d*x+c)+I)-1/8*I/d/a^2*ln(tan(d*x+c)-I)-1/4*I/d/a^2/(tan(
d*x+c)-I)^2+1/4/d/a^2/(tan(d*x+c)-I)
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**B**] time = 3.40, size = 39, normalized size = 0.64

$$\frac{x}{4\,a^2}-\frac{\frac{\tan(c+d\,x)}{4}-\frac{1}{2}\mathrm{i}}{a^2\,d\,\left(1+\tan\left(c+d\,x\right)\,1\mathrm{i}\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

sympy [A] time = 0.23, size = 119, normalized size = 1.95

$$\begin{cases} \frac{\left(16ia^2de^{4ic}e^{-2idx}+4ia^2de^{2ic}e^{-4idx}\right)e^{-6ic}}{64a^4d^2} & \text{for } 64a^4d^2e^{6ic} \neq 0 \\ x\left(\frac{\left(e^{4ic}+2e^{2ic}+1\right)e^{-4ic}}{4a^2}-\frac{1}{4a^2}\right) & \text{otherwise} \end{cases} + \frac{x}{4a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Piecewise((((16*I*a**2*d*exp(4*I*c)*exp(-2*I*d*x) + 4*I*a**2*d*exp(2*I*c)*ex
p(-4*I*d*x))*exp(-6*I*c)/(64*a**4*d**2), Ne(64*a**4*d**2*exp(6*I*c), 0)), (
x*((exp(4*I*c) + 2*exp(2*I*c) + 1)*exp(-4*I*c)/(4*a**2) - 1/(4*a**2)), True
)) + x/(4*a**2)
```

3.120 $\int \frac{\cos^2(c+dx)}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=114

$$-\frac{i}{16d\left(a^2-ia^2\tan(c+dx)\right)}+\frac{3i}{16d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{x}{4a^2}+\frac{ia}{12d(a+ia\tan(c+dx))^3}+\frac{i}{8d(a+ia\tan(c+dx))^2}$$

```
[Out] 1/4*x/a^2+1/12*I*a/d/(a+I*a*tan(d*x+c))^3+1/8*I/d/(a+I*a*tan(d*x+c))^2-1/16
*I/d/(a^2-I*a^2*tan(d*x+c))+3/16*I/d/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.08, antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3487, 44, 206}

$$-\frac{i}{16d\left(a^2-ia^2\tan(c+dx)\right)}+\frac{3i}{16d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{x}{4a^2}+\frac{ia}{12d(a+ia\tan(c+dx))^3}+\frac{i}{8d(a+ia\tan(c+dx))^2}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] x/(4*a^2) + ((I/12)*a)/(d*(a + I*a*Tan[c + d*x])^3) + (I/8)/(d*(a + I*a*Tan
[c + d*x])^2) - (I/16)/(d*(a^2 - I*a^2*Tan[c + d*x])) + ((3*I)/16)/(d*(a^2
+ I*a^2*Tan[c + d*x]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 206

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^2(c+dx)}{(a+ia\tan(c+dx))^2}\,dx = -\frac{\left(ia^3\right)\operatorname{Subst}\left(\int \frac{1}{(a-x)^2(a+x)^4}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{\left(ia^3\right)\operatorname{Subst}\left(\int \left(\frac{1}{16a^4(a-x)^2}+\frac{1}{4a^2(a+x)^4}+\frac{1}{4a^3(a+x)^3}+\frac{3}{16a^4(a+x)^2}+\frac{1}{4a^4\left(a^2-x^2\right)}\right)dx, x, ia\,\mathrm{t}\right.}{d}$$

$$= \frac{ia}{12d(a+ia\tan(c+dx))^3}+\frac{i}{8d(a+ia\tan(c+dx))^2}-\frac{i}{16d\left(a^2-ia^2\tan(c+dx)\right)}+\cdots$$

$$= \frac{x}{4a^2}+\frac{ia}{12d(a+ia\tan(c+dx))^3}+\frac{i}{8d(a+ia\tan(c+dx))^2}-\frac{i}{16d\left(a^2-ia^2\tan(c+d\right.}$$

Mathematica [A] time = 0.30, size = 95, normalized size = 0.83

$$\frac{i\sec^2(c+dx)(-12dx\sin(2(c+dx))+3i\sin(2(c+dx))+2i\sin(4(c+dx))+(-3+12idx)\cos(2(c+dx))+\cos(4\cdots}{48a^2d(\tan(c+dx)-i)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] ((I/48)*Sec[c + d*x]^2*(-9 + (-3 + (12*I)*d*x)*Cos[2*(c + d*x)] + Cos[4*(c
+ d*x)] + (3*I)*Sin[2*(c + d*x)] - 12*d*x*Sin[2*(c + d*x)] + (2*I)*Sin[4*(c
 + d*x)]))/(a^2*d*(-I + Tan[c + d*x])^2)
```

fricas [A] time = 0.50, size = 65, normalized size = 0.57

$$\frac{\left(24\,dxe^{(6i\,dx+6i\,c)}-3i\,e^{(8i\,dx+8i\,c)}+18i\,e^{(4i\,dx+4i\,c)}+6i\,e^{(2i\,dx+2i\,c)}+i\right)e^{(-6i\,dx-6i\,c)}}{96\,a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/96*(24*d*x*e^(6*I*d*x + 6*I*c) - 3*I*e^(8*I*d*x + 8*I*c) + 18*I*e^(4*I*d*
x + 4*I*c) + 6*I*e^(2*I*d*x + 2*I*c) + I)*e^(-6*I*d*x - 6*I*c)/(a^2*d)
```

giac [A] time = 0.94, size = 103, normalized size = 0.90

$$-\frac{-\frac{6i\log(\tan(dx+c)+i)}{a^2}+\frac{6i\log(\tan(dx+c)-i)}{a^2}+\frac{3(2i\tan(dx+c)-3)}{a^2(\tan(dx+c)+i)}+\frac{-11i\tan(dx+c)^3-42\tan(dx+c)^2+57i\tan(dx+c)+30}{a^2(\tan(dx+c)-i)^3}}{48\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -1/48*(-6*I*log(tan(d*x + c) + I)/a^2 + 6*I*log(tan(d*x + c) - I)/a^2 + 3*(
2*I*tan(d*x + c) - 3)/(a^2*(tan(d*x + c) + I)) + (-11*I*tan(d*x + c)^3 - 42
*tan(d*x + c)^2 + 57*I*tan(d*x + c) + 30)/(a^2*(tan(d*x + c) - I)^3))/d
```

maple [A] time = 0.44, size = 117, normalized size = 1.03

$$\frac{i\ln(\tan(dx+c)+i)}{8d\,a^2}+\frac{1}{16a^2d\,(\tan(dx+c)+i)}-\frac{i\ln(\tan(dx+c)-i)}{8a^2d}-\frac{i}{8d\,a^2\,(\tan(dx+c)-i)^2}-\frac{1}{12a^2d\,(\tan(dx+\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 1/8*I/d/a^2*ln(tan(d*x+c)+I)+1/16/a^2/d/(tan(d*x+c)+I)-1/8*I/d/a^2*ln(tan(d
*x+c)-I)-1/8*I/a^2/d/(tan(d*x+c)-I)^2-1/12/a^2/d/(tan(d*x+c)-I)^3+3/16/d/a^
2/(tan(d*x+c)-I)
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 3.47, size = 71, normalized size = 0.62

$$\frac{x}{4\,a^2}-\frac{\frac{{\mathrm{tan}\left(c+d\,x\right)}^3\,1{}\mathrm{i}}{4}+\frac{{\mathrm{tan}\left(c+d\,x\right)}^2}{2}-\frac{\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}}{12}+\frac{1}{3}}{a^2\,d\,{\left(1+\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^3\,\left(\mathrm{tan}\left(c+d\,x\right)+1{}\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2/(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] x/(4*a^2) - (tan(c + d*x)^2/2 - (tan(c + d*x)*1i)/12 + (tan(c + d*x)^3*1i)/
4 + 1/3)/(a^2*d*(tan(c + d*x)*1i + 1)^3*(tan(c + d*x) + 1i))
```

sympy [A] time = 0.39, size = 190, normalized size = 1.67

$$\begin{cases} \frac{\left(- 24576 i a^{6} d^{3} e^{14 i c} e^{2 i d x} + 147456 i a^{6} d^{3} e^{10 i c} e^{- 2 i d x} + 49152 i a^{6} d^{3} e^{8 i c} e^{- 4 i d x} + 8192 i a^{6} d^{3} e^{6 i c} e^{- 6 i d x}\right) e^{- 12 i c}}{786432 a^{8} d^{4}} & \text{for}\: 786432 a^{8} d^{4} e^{12 i c} \neq 0 \\ x \left(\frac{\left(e^{8 i c} + 4 e^{6 i c} + 6 e^{4 i c} + 4 e^{2 i c} + 1\right) e^{- 6 i c}}{16 a^{2}} - \frac{1}{4 a^{2}}\right) & \text{otherwise} \end{cases} + \frac{x}{4 a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Piecewise(((-24576*I*a**6*d**3*exp(14*I*c)*exp(2*I*d*x) + 147456*I*a**6*d**
3*exp(10*I*c)*exp(-2*I*d*x) + 49152*I*a**6*d**3*exp(8*I*c)*exp(-4*I*d*x) +
8192*I*a**6*d**3*exp(6*I*c)*exp(-6*I*d*x))*exp(-12*I*c)/(786432*a**8*d**4),
 Ne(786432*a**8*d**4*exp(12*I*c), 0)), (x*((exp(8*I*c) + 4*exp(6*I*c) + 6*e
xp(4*I*c) + 4*exp(2*I*c) + 1)*exp(-6*I*c)/(16*a**2) - 1/(4*a**2)), True)) +
 x/(4*a**2)
```

3.121 $\int \frac{\cos^4(c+dx)}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=165

$$\frac{ia^2}{32d(a+ia\tan(c+dx))^4}-\frac{5i}{64d\left(a^2-ia^2\tan(c+dx)\right)}+\frac{5i}{32d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{15x}{64a^2}+\frac{ia}{16d(a+ia\tan(c+dx))^3}$$

```
[Out] 15/64*x/a^2-1/64*I/d/(a-I*a*tan(d*x+c))^2+1/32*I*a^2/d/(a+I*a*tan(d*x+c))^4
+1/16*I*a/d/(a+I*a*tan(d*x+c))^3+3/32*I/d/(a+I*a*tan(d*x+c))^2-5/64*I/d/(a^
2-I*a^2*tan(d*x+c))+5/32*I/d/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.10, antiderivative size = 165, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3487, 44, 206}

$$\frac{ia^2}{32d(a+ia\tan(c+dx))^4}-\frac{5i}{64d\left(a^2-ia^2\tan(c+dx)\right)}+\frac{5i}{32d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{15x}{64a^2}+\frac{ia}{16d(a+ia\tan(c+dx))^3}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (15*x)/(64*a^2) - (I/64)/(d*(a - I*a*Tan[c + d*x])^2) + ((I/32)*a^2)/(d*(a
+ I*a*Tan[c + d*x])^4) + ((I/16)*a)/(d*(a + I*a*Tan[c + d*x])^3) + ((3*I)/3
2)/(d*(a + I*a*Tan[c + d*x])^2) - ((5*I)/64)/(d*(a^2 - I*a^2*Tan[c + d*x]))
 + ((5*I)/32)/(d*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 206

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^4(c+dx)}{(a+ia\tan(c+dx))^2}\,dx = -\frac{(ia^5)\,\text{Subst}\left(\int \frac{1}{(a-x)^3(a+x)^5}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{(ia^5)\,\text{Subst}\left(\int \left(\frac{1}{32a^5(a-x)^3} + \frac{5}{64a^6(a-x)^2} + \frac{1}{8a^3(a+x)^5} + \frac{3}{16a^4(a+x)^4} + \frac{3}{16a^5(a+x)^3} + \frac{}{32a^6(}\right.\right.}{d}$$

$$= -\frac{i}{64d(a-ia\tan(c+dx))^2} + \frac{ia^2}{32d(a+ia\tan(c+dx))^4} + \frac{ia}{16d(a+ia\tan(c+dx))^3}$$

$$= \frac{15x}{64a^2} - \frac{i}{64d(a-ia\tan(c+dx))^2} + \frac{ia^2}{32d(a+ia\tan(c+dx))^4} + \frac{ia}{16d(a+ia\tan(c}$$

Mathematica [A] time = 0.34, size = 120, normalized size = 0.73

$$\frac{i\sec^2(c+dx)(-120dx\sin(2(c+dx)) + 30i\sin(2(c+dx)) + 32i\sin(4(c+dx)) + 3i\sin(6(c+dx)) + 30i(4dx+}{512a^2d(\tan(c+dx)-i)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] ((I/512)*Sec[c + d*x]^2*(-80 + (30*I)*(I + 4*d*x)*Cos[2*(c + d*x)] + 16*Cos
[4*(c + d*x)] + Cos[6*(c + d*x)] + (30*I)*Sin[2*(c + d*x)] - 120*d*x*Sin[2*
(c + d*x)] + (32*I)*Sin[4*(c + d*x)] + (3*I)*Sin[6*(c + d*x)]))/(a^2*d*(-I
+ Tan[c + d*x])^2)
```

fricas [A] time = 0.54, size = 87, normalized size = 0.53

$$\frac{\left(120\,dxe^{(8i\,dx+8i\,c)} - 2i\,e^{(12i\,dx+12i\,c)} - 24i\,e^{(10i\,dx+10i\,c)} + 80i\,e^{(6i\,dx+6i\,c)} + 30i\,e^{(4i\,dx+4i\,c)} + 8i\,e^{(2i\,dx+2i\,c)} + i\right)e^{(-8i\,dx-8}}{512\,a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/512*(120*d*x*e^(8*I*d*x + 8*I*c) - 2*I*e^(12*I*d*x + 12*I*c) - 24*I*e^(10
*I*d*x + 10*I*c) + 80*I*e^(6*I*d*x + 6*I*c) + 30*I*e^(4*I*d*x + 4*I*c) + 8*
I*e^(2*I*d*x + 2*I*c) + I)*e^(-8*I*d*x - 8*I*c)/(a^2*d)
```

giac [A] time = 0.93, size = 127, normalized size = 0.77

$$-\frac{\frac{60i\log(i\tan(dx+c)+1)}{a^2} - \frac{60i\log(i\tan(dx+c)-1)}{a^2} + \frac{2\left(45i\tan(dx+c)^2-110\tan(dx+c)-69i\right)}{a^2(\tan(dx+c)+i)^2} + \frac{-125i\tan(dx+c)^4-580\tan(dx+c)^3+1038i\tan}{a^2(\tan(dx+c)-i)}}{512\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -1/512*(60*I*log(I*tan(d*x + c) + 1)/a^2 - 60*I*log(I*tan(d*x + c) - 1)/a^2
 + 2*(45*I*tan(d*x + c)^2 - 110*tan(d*x + c) - 69*I)/(a^2*(tan(d*x + c) + I
)^2) + (-125*I*tan(d*x + c)^4 - 580*tan(d*x + c)^3 + 1038*I*tan(d*x + c)^2
+ 868*tan(d*x + c) - 301*I)/(a^2*(tan(d*x + c) - I)^4))/d
```

maple [A] time = 0.43, size = 157, normalized size = 0.95

$$\frac{i}{64a^2d(\tan(dx+c)+i)^2} + \frac{15i\ln(\tan(dx+c)+i)}{128d\,a^2} + \frac{5}{64a^2d(\tan(dx+c)+i)} - \frac{15i\ln(\tan(dx+c)-i)}{128a^2d} + \frac{}{32a^2d(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 1/64*I/a^2/d/(tan(d*x+c)+I)^2+15/128*I/a^2/d*ln(tan(d*x+c)+I)+5/64/a^2/d/(t
an(d*x+c)+I)-15/128*I/a^2/d*ln(tan(d*x+c)-I)+1/32*I/a^2/d/(tan(d*x+c)-I)^4-
3/32*I/a^2/d/(tan(d*x+c)-I)^2-1/16/a^2/d/(tan(d*x+c)-I)^3+5/32/d/a^2/(tan(d
*x+c)-I)
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 4.18, size = 149, normalized size = 0.90

$$\frac{15\,x}{64\,a^2}+\frac{\frac{1}{4\,a^2}-\frac{\tan(c+d\,x)\,17\mathrm{i}}{64\,a^2}+\frac{25\,\tan(c+d\,x)^2}{32\,a^2}+\frac{\tan(c+d\,x)^3\,5\mathrm{i}}{32\,a^2}+\frac{15\,\tan(c+d\,x)^4}{32\,a^2}+\frac{\tan(c+d\,x)^5\,15\mathrm{i}}{64\,a^2}}{d\,\left(\tan\left(c+d\,x\right)^6\,1\mathrm{i}+2\,\tan\left(c+d\,x\right)^5+\tan\left(c+d\,x\right)^4\,1\mathrm{i}+4\,\tan\left(c+d\,x\right)^3-\tan\left(c+d\,x\right)^2\,1\mathrm{i}+2\,\tan\left(c+d\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4/(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] (15*x)/(64*a^2) + (1/(4*a^2) - (tan(c + d*x)*17i)/(64*a^2) + (25*tan(c + d*
x)^2)/(32*a^2) + (tan(c + d*x)^3*5i)/(32*a^2) + (15*tan(c + d*x)^4)/(32*a^2
) + (tan(c + d*x)^5*15i)/(64*a^2))/(d*(2*tan(c + d*x) - tan(c + d*x)^2*1i +
 4*tan(c + d*x)^3 + tan(c + d*x)^4*1i + 2*tan(c + d*x)^5 + tan(c + d*x)^6*1
i - 1i))
```

sympy [A] time = 0.51, size = 260, normalized size = 1.58

$$\begin{cases} \frac{\left(-17179869184ia^{10}d^5e^{24ic}e^{4idx}-206158430208ia^{10}d^5e^{22ic}e^{2idx}+687194767360ia^{10}d^5e^{18ic}e^{-2idx}+257698037760ia^{10}d^5e^{16ic}e^{-4idx}+68719476736ia^{10}d^5\right.}{4398046511104a^{12}d^6} \\ x\left(\frac{\left(e^{12ic}+6e^{10ic}+15e^{8ic}+20e^{6ic}+15e^{4ic}+6e^{2ic}+1\right)e^{-8ic}}{64a^2}-\frac{15}{64a^2}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Piecewise(((-17179869184*I*a**10*d**5*exp(24*I*c)*exp(4*I*d*x) - 2061584302
08*I*a**10*d**5*exp(22*I*c)*exp(2*I*d*x) + 687194767360*I*a**10*d**5*exp(18
*I*c)*exp(-2*I*d*x) + 257698037760*I*a**10*d**5*exp(16*I*c)*exp(-4*I*d*x) +
 68719476736*I*a**10*d**5*exp(14*I*c)*exp(-6*I*d*x) + 8589934592*I*a**10*d*
*5*exp(12*I*c)*exp(-8*I*d*x))*exp(-20*I*c)/(4398046511104*a**12*d**6), Ne(4
398046511104*a**12*d**6*exp(20*I*c), 0)), (x*((exp(12*I*c) + 6*exp(10*I*c)
+ 15*exp(8*I*c) + 20*exp(6*I*c) + 15*exp(4*I*c) + 6*exp(2*I*c) + 1)*exp(-8*
I*c)/(64*a**2) - 15/(64*a**2)), True)) + 15*x/(64*a**2)
```

3.122 $\int \frac{\sec^9(c+dx)}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=124

$$\frac{7\tanh^{-1}(\sin(c+dx))}{16a^2d}-\frac{2i\sec^7(c+dx)}{5d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{7\tan(c+dx)\sec^5(c+dx)}{30a^2d}+\frac{7\tan(c+dx)\sec^3(c+dx)}{24a^2d}+\frac{7\mathrm{ta}}{}$$

```
[Out] 7/16*arctanh(sin(d*x+c))/a^2/d+7/16*sec(d*x+c)*tan(d*x+c)/a^2/d+7/24*sec(d*
x+c)^3*tan(d*x+c)/a^2/d+7/30*sec(d*x+c)^5*tan(d*x+c)/a^2/d-2/5*I*sec(d*x+c)
^7/d/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.08, antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3500, 3768, 3770}

$$\frac{7\tanh^{-1}(\sin(c+dx))}{16a^2d}-\frac{2i\sec^7(c+dx)}{5d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{7\tan(c+dx)\sec^5(c+dx)}{30a^2d}+\frac{7\tan(c+dx)\sec^3(c+dx)}{24a^2d}+\frac{7\mathrm{ta}}{}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^9/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (7*ArcTanh[Sin[c + d*x]])/(16*a^2*d) + (7*Sec[c + d*x]*Tan[c + d*x])/(16*a^
2*d) + (7*Sec[c + d*x]^3*Tan[c + d*x])/(24*a^2*d) + (7*Sec[c + d*x]^5*Tan[c
 + d*x])/(30*a^2*d) - (((2*I)/5)*Sec[c + d*x]^7)/(d*(a^2 + I*a^2*Tan[c + d*
x]))
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3768

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \frac{\sec^9(c+dx)}{(a+ia\tan(c+dx))^2}\,dx = -\frac{2i\sec^7(c+dx)}{5d\left(a^2+ia^2\tan(c+dx)\right)} + \frac{7\int \sec^7(c+dx)\,dx}{5a^2}$$
$$= \frac{7\sec^5(c+dx)\tan(c+dx)}{30a^2d} - \frac{2i\sec^7(c+dx)}{5d\left(a^2+ia^2\tan(c+dx)\right)} + \frac{7\int \sec^5(c+dx)\,dx}{6a^2}$$
$$= \frac{7\sec^3(c+dx)\tan(c+dx)}{24a^2d} + \frac{7\sec^5(c+dx)\tan(c+dx)}{30a^2d} - \frac{2i\sec^7(c+dx)}{5d\left(a^2+ia^2\tan(c+dx)\right)}$$
$$= \frac{7\sec(c+dx)\tan(c+dx)}{16a^2d} + \frac{7\sec^3(c+dx)\tan(c+dx)}{24a^2d} + \frac{7\sec^5(c+dx)\tan(c+dx)}{30a^2d}$$
$$= \frac{7\tanh^{-1}(\sin(c+dx))}{16a^2d} + \frac{7\sec(c+dx)\tan(c+dx)}{16a^2d} + \frac{7\sec^3(c+dx)\tan(c+dx)}{24a^2d} + $$

Mathematica [B] time = 2.15, size = 294, normalized size = 2.37

$$-\frac{\sec^6(c+dx)\left(5\left(60\sin(c+dx)-238\sin(3(c+dx))-42\sin(5(c+dx))+21\cos(6(c+dx))\log\left(\cos\left(\frac{1}{2}(c+dx)\right)\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^9/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] -1/7680*(Sec[c + d*x]^6*((3072*I)*Cos[c + d*x] + 5*(210*Log[Cos[(c + d*x)/2
] - Sin[(c + d*x)/2]] + 21*Cos[6*(c + d*x)]*Log[Cos[(c + d*x)/2] - Sin[(c +
 d*x)/2]] + 315*Cos[2*(c + d*x)]*(Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]]
- Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]) + 126*Cos[4*(c + d*x)]*(Log[Cos
[(c + d*x)/2] - Sin[(c + d*x)/2]] - Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]
]) - 210*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] - 21*Cos[6*(c + d*x)]*Log
[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] + 60*Sin[c + d*x] - 238*Sin[3*(c + d*
x)] - 42*Sin[5*(c + d*x)])))/(a^2*d)
```

fricas [B] time = 0.67, size = 326, normalized size = 2.63

$$\frac{105\left(e^{(12i\,dx+12i\,c)}+6\,e^{(10i\,dx+10i\,c)}+15\,e^{(8i\,dx+8i\,c)}+20\,e^{(6i\,dx+6i\,c)}+15\,e^{(4i\,dx+4i\,c)}+6\,e^{(2i\,dx+2i\,c)}+1\right)\log\left(e^{(i\,dx+i\,c)}+i\right.}{240}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/240*(105*(e^(12*I*d*x + 12*I*c) + 6*e^(10*I*d*x + 10*I*c) + 15*e^(8*I*d*x
 + 8*I*c) + 20*e^(6*I*d*x + 6*I*c) + 15*e^(4*I*d*x + 4*I*c) + 6*e^(2*I*d*x
+ 2*I*c) + 1)*log(e^(I*d*x + I*c) + I) - 105*(e^(12*I*d*x + 12*I*c) + 6*e^(
10*I*d*x + 10*I*c) + 15*e^(8*I*d*x + 8*I*c) + 20*e^(6*I*d*x + 6*I*c) + 15*e
^(4*I*d*x + 4*I*c) + 6*e^(2*I*d*x + 2*I*c) + 1)*log(e^(I*d*x + I*c) - I) -
210*I*e^(11*I*d*x + 11*I*c) - 1190*I*e^(9*I*d*x + 9*I*c) - 2772*I*e^(7*I*d*
x + 7*I*c) - 3372*I*e^(5*I*d*x + 5*I*c) + 1190*I*e^(3*I*d*x + 3*I*c) + 210*
I*e^(I*d*x + I*c))/(a^2*d*e^(12*I*d*x + 12*I*c) + 6*a^2*d*e^(10*I*d*x + 10*
I*c) + 15*a^2*d*e^(8*I*d*x + 8*I*c) + 20*a^2*d*e^(6*I*d*x + 6*I*c) + 15*a^2
*d*e^(4*I*d*x + 4*I*c) + 6*a^2*d*e^(2*I*d*x + 2*I*c) + a^2*d)
```

giac [A] time = 1.12, size = 203, normalized size = 1.64

$$\frac{105\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^2} - \frac{105\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)}{a^2} + \frac{2\left(135\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{11}+480i\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{10}-445\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{9}-480i\tan\left(\frac{1}{2}\,dx+\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/240*(105*log(tan(1/2*d*x + 1/2*c) + 1)/a^2 - 105*log(tan(1/2*d*x + 1/2*c)
 - 1)/a^2 + 2*(135*tan(1/2*d*x + 1/2*c)^11 + 480*I*tan(1/2*d*x + 1/2*c)^10
- 445*tan(1/2*d*x + 1/2*c)^9 - 480*I*tan(1/2*d*x + 1/2*c)^8 - 330*tan(1/2*d
*x + 1/2*c)^7 + 960*I*tan(1/2*d*x + 1/2*c)^6 - 330*tan(1/2*d*x + 1/2*c)^5 -
 960*I*tan(1/2*d*x + 1/2*c)^4 - 445*tan(1/2*d*x + 1/2*c)^3 + 96*I*tan(1/2*d
*x + 1/2*c)^2 + 135*tan(1/2*d*x + 1/2*c) - 96*I)/((tan(1/2*d*x + 1/2*c)^2 -
 1)^6*a^2))/d
```

maple [B] time = 0.38, size = 514, normalized size = 4.15

$$-\frac{1}{2a^2d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^4}+\frac{5i}{4a^2d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^2}+\frac{9}{16d\,a^2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2}+\frac{3i}{4a^2d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] -1/2/a^2/d/(tan(1/2*d*x+1/2*c)-1)^4+5/4*I/a^2/d/(tan(1/2*d*x+1/2*c)+1)^2+9/
16/d/a^2/(tan(1/2*d*x+1/2*c)-1)^2+3/4*I/a^2/d/(tan(1/2*d*x+1/2*c)-1)+9/16/a
^2/d/(tan(1/2*d*x+1/2*c)-1)-3/4*I/a^2/d/(tan(1/2*d*x+1/2*c)+1)-1/6/d/a^2/(t
an(1/2*d*x+1/2*c)-1)^3-3/2*I/a^2/d/(tan(1/2*d*x+1/2*c)+1)^3-1/2/a^2/d/(tan(
1/2*d*x+1/2*c)-1)^5+I/a^2/d/(tan(1/2*d*x+1/2*c)-1)^4-1/6/a^2/d/(tan(1/2*d*x
+1/2*c)-1)^6-7/16/a^2/d*ln(tan(1/2*d*x+1/2*c)-1)+1/2/a^2/d/(tan(1/2*d*x+1/2
*c)+1)^4-2/5*I/a^2/d/(tan(1/2*d*x+1/2*c)+1)^5+9/16/a^2/d/(tan(1/2*d*x+1/2*c
)+1)+I/a^2/d/(tan(1/2*d*x+1/2*c)+1)^4-1/6/d/a^2/(tan(1/2*d*x+1/2*c)+1)^3+3/
2*I/a^2/d/(tan(1/2*d*x+1/2*c)-1)^3-1/2/a^2/d/(tan(1/2*d*x+1/2*c)+1)^5+5/4*I
/a^2/d/(tan(1/2*d*x+1/2*c)-1)^2-9/16/d/a^2/(tan(1/2*d*x+1/2*c)+1)^2+2/5*I/a
^2/d/(tan(1/2*d*x+1/2*c)-1)^5+1/6/a^2/d/(tan(1/2*d*x+1/2*c)+1)^6+7/16/a^2/d
*ln(tan(1/2*d*x+1/2*c)+1)
```

maxima [B] time = 0.36, size = 421, normalized size = 3.40

$$\frac{\frac{2\left(\frac{135\sin(dx+c)}{\cos(dx+c)+1}+\frac{96i\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-\frac{445\sin(dx+c)^3}{(\cos(dx+c)+1)^3}-\frac{960i\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{330\sin(dx+c)^5}{(\cos(dx+c)+1)^5}+\frac{960i\sin(dx+c)^6}{(\cos(dx+c)+1)^6}-\frac{330\sin(dx+c)^7}{(\cos(dx+c)+1)^7}-\frac{480i\sin(dx+c)^8}{(\cos(dx+c)+1)^8}-\frac{445\sin(dx+c)^9}{(\cos(dx+c)+1)^9}+\frac{480i\sin\cdots}{(\cos(dx\cdots}\cdots\right)}{a^2-\frac{6a^2\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{15a^2\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{20a^2\sin(dx+c)^6}{(\cos(dx+c)+1)^6}+\frac{15a^2\sin(dx+c)^8}{(\cos(dx+c)+1)^8}-\frac{6a^2\sin(dx+c)^{10}}{(\cos(dx+c)+1)^{10}}+\frac{a^2\sin(dx+c)^{12}}{(\cos(dx+c)+1)^{12}}}\cdots}{240\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/240*(2*(135*sin(d*x + c)/(cos(d*x + c) + 1) + 96*I*sin(d*x + c)^2/(cos(d*
x + c) + 1)^2 - 445*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 - 960*I*sin(d*x + c
)^4/(cos(d*x + c) + 1)^4 - 330*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 + 960*I*
sin(d*x + c)^6/(cos(d*x + c) + 1)^6 - 330*sin(d*x + c)^7/(cos(d*x + c) + 1)
^7 - 480*I*sin(d*x + c)^8/(cos(d*x + c) + 1)^8 - 445*sin(d*x + c)^9/(cos(d*
x + c) + 1)^9 + 480*I*sin(d*x + c)^10/(cos(d*x + c) + 1)^10 + 135*sin(d*x +
 c)^11/(cos(d*x + c) + 1)^11 - 96*I)/(a^2 - 6*a^2*sin(d*x + c)^2/(cos(d*x +
 c) + 1)^2 + 15*a^2*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 20*a^2*sin(d*x +
c)^6/(cos(d*x + c) + 1)^6 + 15*a^2*sin(d*x + c)^8/(cos(d*x + c) + 1)^8 - 6*
a^2*sin(d*x + c)^10/(cos(d*x + c) + 1)^10 + a^2*sin(d*x + c)^12/(cos(d*x +
c) + 1)^12) + 105*log(sin(d*x + c)/(cos(d*x + c) + 1) + 1)/a^2 - 105*log(si
n(d*x + c)/(cos(d*x + c) + 1) - 1)/a^2)/d
```

mupad [B] time = 6.31, size = 191, normalized size = 1.54

$$\frac{7\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{8\,a^2\,d}-\frac{-\frac{9\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{11}}{8}-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}4\mathrm{i}+\frac{89\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{9}}{24}+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{8}4\mathrm{i}+\frac{11\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{7}}{4}-\mathrm{ta}\cdots}{a^2\,d\left(\mathrm{tan}\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^9*(a + a*tan(c + d*x)*1i)^2),x)
```

```
[Out] (7*atanh(tan(c/2 + (d*x)/2)))/(8*a^2*d) - ((89*tan(c/2 + (d*x)/2)^3)/24 - (
tan(c/2 + (d*x)/2)^2*4i)/5 - (9*tan(c/2 + (d*x)/2))/8 + tan(c/2 + (d*x)/2)^
4*8i + (11*tan(c/2 + (d*x)/2)^5)/4 - tan(c/2 + (d*x)/2)^6*8i + (11*tan(c/2
+ (d*x)/2)^7)/4 + tan(c/2 + (d*x)/2)^8*4i + (89*tan(c/2 + (d*x)/2)^9)/24 -
tan(c/2 + (d*x)/2)^10*4i - (9*tan(c/2 + (d*x)/2)^11)/8 + 4i/5)/(a^2*d*(tan(
c/2 + (d*x)/2)^2 - 1)^6)
```

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

$$-\frac{\int \frac{\sec^9(c+dx)}{\tan^2(c+dx)-2i\tan(c+dx)-1}\,dx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**9/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -Integral(sec(c + d*x)**9/(tan(c + d*x)**2 - 2*I*tan(c + d*x) - 1), x)/a**2
```

3.123 $\int \frac{\sec^7(c+dx)}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=100

$$\frac{5\tanh^{-1}(\sin(c+dx))}{8a^2d}-\frac{2i\sec^5(c+dx)}{3d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{5\tan(c+dx)\sec^3(c+dx)}{12a^2d}+\frac{5\tan(c+dx)\sec(c+dx)}{8a^2d}$$

```
[Out] 5/8*arctanh(sin(d*x+c))/a^2/d+5/8*sec(d*x+c)*tan(d*x+c)/a^2/d+5/12*sec(d*x+
c)^3*tan(d*x+c)/a^2/d-2/3*I*sec(d*x+c)^5/d/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.07, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3500, 3768, 3770}

$$\frac{5\tanh^{-1}(\sin(c+dx))}{8a^2d}-\frac{2i\sec^5(c+dx)}{3d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{5\tan(c+dx)\sec^3(c+dx)}{12a^2d}+\frac{5\tan(c+dx)\sec(c+dx)}{8a^2d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^7/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (5*ArcTanh[Sin[c + d*x]])/(8*a^2*d) + (5*Sec[c + d*x]*Tan[c + d*x])/(8*a^2*
d) + (5*Sec[c + d*x]^3*Tan[c + d*x])/(12*a^2*d) - (((2*I)/3)*Sec[c + d*x]^5
)/(d*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3768

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \frac{\sec^7(c+dx)}{(a+ia\tan(c+dx))^2}\,dx = -\frac{2i\sec^5(c+dx)}{3d\left(a^2+ia^2\tan(c+dx)\right)} + \frac{5\int \sec^5(c+dx)\,dx}{3a^2}$$
$$= \frac{5\sec^3(c+dx)\tan(c+dx)}{12a^2d} - \frac{2i\sec^5(c+dx)}{3d\left(a^2+ia^2\tan(c+dx)\right)} + \frac{5\int \sec^3(c+dx)\,dx}{4a^2}$$
$$= \frac{5\sec(c+dx)\tan(c+dx)}{8a^2d} + \frac{5\sec^3(c+dx)\tan(c+dx)}{12a^2d} - \frac{2i\sec^5(c+dx)}{3d\left(a^2+ia^2\tan(c+dx)\right)}$$
$$= \frac{5\tanh^{-1}(\sin(c+dx))}{8a^2d} + \frac{5\sec(c+dx)\tan(c+dx)}{8a^2d} + \frac{5\sec^3(c+dx)\tan(c+dx)}{12a^2d} - \frac{}{3}$$

Mathematica [B] time = 1.11, size = 215, normalized size = 2.15

$$-\frac{\sec^4(c+dx)\left(18\sin(c+dx)-30\sin(3(c+dx))+128i\cos(c+dx)+45\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^7/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] -1/192*(Sec[c + d*x]^4*((128*I)*Cos[c + d*x] + 45*Log[Cos[(c + d*x)/2] - Si
n[(c + d*x)/2]] + 60*Cos[2*(c + d*x)]*(Log[Cos[(c + d*x)/2] - Sin[(c + d*x)
/2]] - Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]) + 15*Cos[4*(c + d*x)]*(Log
[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - Log[Cos[(c + d*x)/2] + Sin[(c + d*x
)/2]]) - 45*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] + 18*Sin[c + d*x] - 30
*Sin[3*(c + d*x)]))/(a^2*d)
```

fricas [B] time = 0.55, size = 230, normalized size = 2.30

$$\frac{15\left(e^{(8i\,dx+8i\,c)}+4\,e^{(6i\,dx+6i\,c)}+6\,e^{(4i\,dx+4i\,c)}+4\,e^{(2i\,dx+2i\,c)}+1\right)\log\left(e^{(i\,dx+i\,c)}+i\right)-15\left(e^{(8i\,dx+8i\,c)}+4\,e^{(6i\,dx+6i\,c)}+6\,e\right.}{24\left(a^2de^{(8i\,dx+8i\,c)}+4\,a^2de^{(6i\,dx+6i\,c)}+6\,a^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/24*(15*(e^(8*I*d*x + 8*I*c) + 4*e^(6*I*d*x + 6*I*c) + 6*e^(4*I*d*x + 4*I*
c) + 4*e^(2*I*d*x + 2*I*c) + 1)*log(e^(I*d*x + I*c) + I) - 15*(e^(8*I*d*x +
 8*I*c) + 4*e^(6*I*d*x + 6*I*c) + 6*e^(4*I*d*x + 4*I*c) + 4*e^(2*I*d*x + 2*
I*c) + 1)*log(e^(I*d*x + I*c) - I) - 30*I*e^(7*I*d*x + 7*I*c) - 110*I*e^(5*
I*d*x + 5*I*c) - 146*I*e^(3*I*d*x + 3*I*c) + 30*I*e^(I*d*x + I*c))/(a^2*d*e
^(8*I*d*x + 8*I*c) + 4*a^2*d*e^(6*I*d*x + 6*I*c) + 6*a^2*d*e^(4*I*d*x + 4*I
*c) + 4*a^2*d*e^(2*I*d*x + 2*I*c) + a^2*d)
```

giac [A] time = 0.95, size = 151, normalized size = 1.51

$$\frac{\frac{15\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^2}-\frac{15\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)}{a^2}+\frac{2\left(9\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7+48i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^6-33\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-48i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^4-33\,\mathrm{t}\right.}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)^4a^2}}{24\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/24*(15*log(tan(1/2*d*x + 1/2*c) + 1)/a^2 - 15*log(tan(1/2*d*x + 1/2*c) -
1)/a^2 + 2*(9*tan(1/2*d*x + 1/2*c)^7 + 48*I*tan(1/2*d*x + 1/2*c)^6 - 33*tan
(1/2*d*x + 1/2*c)^5 - 48*I*tan(1/2*d*x + 1/2*c)^4 - 33*tan(1/2*d*x + 1/2*c)
^3 + 16*I*tan(1/2*d*x + 1/2*c)^2 + 9*tan(1/2*d*x + 1/2*c) - 16*I)/((tan(1/2
*d*x + 1/2*c)^2 - 1)^4*a^2))/d
```

maple [B] time = 0.38, size = 342, normalized size = 3.42

$$\frac{3}{8a^2d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\frac{i}{a^2d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\frac{1}{8d\,a^2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2}+\frac{i}{a^2d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^2}-\frac{}{2d\,a^2\left(\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 3/8/a^2/d/(tan(1/2*d*x+1/2*c)-1)+I/a^2/d/(tan(1/2*d*x+1/2*c)-1)+1/8/d/a^2/(
tan(1/2*d*x+1/2*c)-1)^2+I/a^2/d/(tan(1/2*d*x+1/2*c)+1)^2-1/2/d/a^2/(tan(1/2
*d*x+1/2*c)-1)^3-I/a^2/d/(tan(1/2*d*x+1/2*c)+1)-1/4/a^2/d/(tan(1/2*d*x+1/2*
c)-1)^4-5/8/a^2/d*ln(tan(1/2*d*x+1/2*c)-1)+3/8/a^2/d/(tan(1/2*d*x+1/2*c)+1)
-2/3*I/a^2/d/(tan(1/2*d*x+1/2*c)+1)^3-1/8/d/a^2/(tan(1/2*d*x+1/2*c)+1)^2+2/
3*I/a^2/d/(tan(1/2*d*x+1/2*c)-1)^3-1/2/d/a^2/(tan(1/2*d*x+1/2*c)+1)^3+I/a^2
/d/(tan(1/2*d*x+1/2*c)-1)^2+1/4/a^2/d/(tan(1/2*d*x+1/2*c)+1)^4+5/8/a^2/d*ln
(tan(1/2*d*x+1/2*c)+1)
```

maxima [B] time = 0.39, size = 295, normalized size = 2.95

$$\frac{\frac{2\left(\frac{9\sin(dx+c)}{\cos(dx+c)+1}+\frac{16i\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-\frac{33\sin(dx+c)^3}{(\cos(dx+c)+1)^3}-\frac{48i\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{33\sin(dx+c)^5}{(\cos(dx+c)+1)^5}+\frac{48i\sin(dx+c)^6}{(\cos(dx+c)+1)^6}+\frac{9\sin(dx+c)^7}{(\cos(dx+c)+1)^7}-16i\right)}{a^2-\frac{4a^2\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{6a^2\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{4a^2\sin(dx+c)^6}{(\cos(dx+c)+1)^6}+\frac{a^2\sin(dx+c)^8}{(\cos(dx+c)+1)^8}}+\frac{15\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{a^2}-\frac{15}{}}{24d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/24*(2*(9*sin(d*x + c)/(cos(d*x + c) + 1) + 16*I*sin(d*x + c)^2/(cos(d*x +
 c) + 1)^2 - 33*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 - 48*I*sin(d*x + c)^4/(
cos(d*x + c) + 1)^4 - 33*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 + 48*I*sin(d*x
 + c)^6/(cos(d*x + c) + 1)^6 + 9*sin(d*x + c)^7/(cos(d*x + c) + 1)^7 - 16*I
)/(a^2 - 4*a^2*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 6*a^2*sin(d*x + c)^4/(
cos(d*x + c) + 1)^4 - 4*a^2*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 + a^2*sin(d
*x + c)^8/(cos(d*x + c) + 1)^8) + 15*log(sin(d*x + c)/(cos(d*x + c) + 1) +
1)/a^2 - 15*log(sin(d*x + c)/(cos(d*x + c) + 1) - 1)/a^2)/d
```

mupad [B] time = 5.92, size = 136, normalized size = 1.36

$$\frac{5\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{4\,a^2\,d}+\frac{\frac{3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{4}+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6 4\mathrm{i}-\frac{11\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{4}-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4 4\mathrm{i}-\frac{11\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{4}+\frac{\tan}{}}{a^2\,d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-1\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^7*(a + a*tan(c + d*x)*1i)^2),x)
```

```
[Out] (5*atanh(tan(c/2 + (d*x)/2)))/(4*a^2*d) + ((3*tan(c/2 + (d*x)/2))/4 + (tan(
c/2 + (d*x)/2)^2*4i)/3 - (11*tan(c/2 + (d*x)/2)^3)/4 - tan(c/2 + (d*x)/2)^4
*4i - (11*tan(c/2 + (d*x)/2)^5)/4 + tan(c/2 + (d*x)/2)^6*4i + (3*tan(c/2 +
(d*x)/2)^7)/4 - 4i/3)/(a^2*d*(tan(c/2 + (d*x)/2)^2 - 1)^4)
```

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

$$-\frac{\int \frac{\sec^{7}(c+dx)}{\tan^{2}(c+dx)-2i\tan(c+dx)-1}\,dx}{a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**7/(a+I*a*tan(d*x+c))**2,x)
[Out] -Integral(sec(c + d*x)**7/(tan(c + d*x)**2 - 2*I*tan(c + d*x) - 1), x)/a**2
```

3.124 $\int \frac{\sec^5(c+dx)}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=74

$$\frac{3\tanh^{-1}(\sin(c+dx))}{2a^2d}-\frac{2i\sec^3(c+dx)}{d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{3\tan(c+dx)\sec(c+dx)}{2a^2d}$$

```
[Out] 3/2*arctanh(sin(d*x+c))/a^2/d+3/2*sec(d*x+c)*tan(d*x+c)/a^2/d-2*I*sec(d*x+c
)^3/d/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.06, antiderivative size = 74, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3500, 3768, 3770}

$$\frac{3\tanh^{-1}(\sin(c+dx))}{2a^2d}-\frac{2i\sec^3(c+dx)}{d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{3\tan(c+dx)\sec(c+dx)}{2a^2d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^5/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (3*ArcTanh[Sin[c + d*x]])/(2*a^2*d) + (3*Sec[c + d*x]*Tan[c + d*x])/(2*a^2*
d) - ((2*I)*Sec[c + d*x]^3)/(d*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3768

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^5(c+dx)}{(a+ia\tan(c+dx))^2}\,dx &= -\frac{2i\sec^3(c+dx)}{d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{3\int \sec^3(c+dx)\,dx}{a^2}\\ &= \frac{3\sec(c+dx)\tan(c+dx)}{2a^2d}-\frac{2i\sec^3(c+dx)}{d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{3\int \sec(c+dx)\,dx}{2a^2}\\ &= \frac{3\tanh^{-1}(\sin(c+dx))}{2a^2d}+\frac{3\sec(c+dx)\tan(c+dx)}{2a^2d}-\frac{2i\sec^3(c+dx)}{d\left(a^2+ia^2\tan(c+dx)\right)}\end{aligned}$$

Mathematica [A] time = 0.47, size = 146, normalized size = 1.97

$$-\frac{\sec^2(c+dx)\left(2\sin(c+dx)+8i\cos(c+dx)+3\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)+3\cos(2(c+dx))\left(\log\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^5/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] -1/4*(Sec[c + d*x]^2*((8*I)*Cos[c + d*x] + 3*Log[Cos[(c + d*x)/2] - Sin[(c
+ d*x)/2]] + 3*Cos[2*(c + d*x)]*(Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] -
 Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]) - 3*Log[Cos[(c + d*x)/2] + Sin[(
c + d*x)/2]] + 2*Sin[c + d*x]))/(a^2*d)
```

fricas [B] time = 0.57, size = 134, normalized size = 1.81

$$\frac{3\left(e^{(4i\,dx+4i\,c)}+2\,e^{(2i\,dx+2i\,c)}+1\right)\log\left(e^{(i\,dx+i\,c)}+i\right)-3\left(e^{(4i\,dx+4i\,c)}+2\,e^{(2i\,dx+2i\,c)}+1\right)\log\left(e^{(i\,dx+i\,c)}-i\right)-6i\,e^{(3i\,dx+3i\,c)}}{2\left(a^2de^{(4i\,dx+4i\,c)}+2\,a^2de^{(2i\,dx+2i\,c)}+a^2d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(3*(e^(4*I*d*x + 4*I*c) + 2*e^(2*I*d*x + 2*I*c) + 1)*log(e^(I*d*x + I*c
) + I) - 3*(e^(4*I*d*x + 4*I*c) + 2*e^(2*I*d*x + 2*I*c) + 1)*log(e^(I*d*x +
 I*c) - I) - 6*I*e^(3*I*d*x + 3*I*c) - 10*I*e^(I*d*x + I*c))/(a^2*d*e^(4*I*
d*x + 4*I*c) + 2*a^2*d*e^(2*I*d*x + 2*I*c) + a^2*d)
```

giac [A] time = 0.90, size = 95, normalized size = 1.28

$$\frac{\frac{3\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^2}-\frac{3\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)}{a^2}-\frac{2\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3-4i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+4i\right)}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)^2a^2}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*(3*log(tan(1/2*d*x + 1/2*c) + 1)/a^2 - 3*log(tan(1/2*d*x + 1/2*c) - 1)/
a^2 - 2*(tan(1/2*d*x + 1/2*c)^3 - 4*I*tan(1/2*d*x + 1/2*c)^2 + tan(1/2*d*x
+ 1/2*c) + 4*I)/((tan(1/2*d*x + 1/2*c)^2 - 1)^2*a^2))/d
```

maple [B] time = 0.37, size = 170, normalized size = 2.30

$$-\frac{1}{2a^2d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\frac{2i}{a^2d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}-\frac{1}{2d\,a^2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2}-\frac{3\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{2a^2d}-\frac{}{2a^2d\left(\tan\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] -1/2/a^2/d/(tan(1/2*d*x+1/2*c)-1)+2*I/a^2/d/(tan(1/2*d*x+1/2*c)-1)-1/2/d/a^
2/(tan(1/2*d*x+1/2*c)-1)^2-3/2/a^2/d*ln(tan(1/2*d*x+1/2*c)-1)-1/2/a^2/d/(ta
n(1/2*d*x+1/2*c)+1)-2*I/a^2/d/(tan(1/2*d*x+1/2*c)+1)+1/2/d/a^2/(tan(1/2*d*x
+1/2*c)+1)^2+3/2/a^2/d*ln(tan(1/2*d*x+1/2*c)+1)
```

maxima [B] time = 0.61, size = 167, normalized size = 2.26

$$-\frac{\frac{2\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-\frac{4i\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+4i\right)}{a^2-\frac{2a^2\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{a^2\sin(dx+c)^4}{(\cos(dx+c)+1)^4}}-\frac{3\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{a^2}+\frac{3\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right)}{a^2}}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*(2*(sin(d*x + c)/(cos(d*x + c) + 1) - 4*I*sin(d*x + c)^2/(cos(d*x + c)
 + 1)^2 + sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 4*I)/(a^2 - 2*a^2*sin(d*x +
 c)^2/(cos(d*x + c) + 1)^2 + a^2*sin(d*x + c)^4/(cos(d*x + c) + 1)^4) - 3*l
og(sin(d*x + c)/(cos(d*x + c) + 1) + 1)/a^2 + 3*log(sin(d*x + c)/(cos(d*x +
 c) + 1) - 1)/a^2)/d
```

mupad [B] time = 3.93, size = 104, normalized size = 1.41

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

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^2),x)
```

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

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

$$-\frac{\int \frac{\sec^5(c+dx)}{\tan^2(c+dx)-2i\tan(c+dx)-1}\,dx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**5/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -Integral(sec(c + d*x)**5/(tan(c + d*x)**2 - 2*I*tan(c + d*x) - 1), x)/a**2
```

3.125 $\int \frac{\sec^3(c+dx)}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=48

$$-\frac{\tanh^{-1}(\sin(c+dx))}{a^2d}+\frac{2i\sec(c+dx)}{d\left(a^2+ia^2\tan(c+dx)\right)}$$

```
[Out] -arctanh(sin(d*x+c))/a^2/d+2*I*sec(d*x+c)/d/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.05, antiderivative size = 48, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3500, 3770}

$$-\frac{\tanh^{-1}(\sin(c+dx))}{a^2d}+\frac{2i\sec(c+dx)}{d\left(a^2+ia^2\tan(c+dx)\right)}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] -(ArcTanh[Sin[c + d*x]]/(a^2*d)) + ((2*I)*Sec[c + d*x])/(d*(a^2 + I*a^2*Tan
[c + d*x]))
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^3(c+dx)}{(a+ia\tan(c+dx))^2}\,dx &= \frac{2i\sec(c+dx)}{d\left(a^2+ia^2\tan(c+dx)\right)}-\frac{\int \sec(c+dx)\,dx}{a^2}\\ &= -\frac{\tanh^{-1}(\sin(c+dx))}{a^2d}+\frac{2i\sec(c+dx)}{d\left(a^2+ia^2\tan(c+dx)\right)}\end{aligned}$$

Mathematica [B] time = 0.21, size = 184, normalized size = 3.83

$$-\frac{\sec^2(c+dx)\left(\cos\left(\frac{3}{2}(c+dx)\right)+i\sin\left(\frac{3}{2}(c+dx)\right)\right)\left(\cos\left(\frac{1}{2}(c+dx)\right)\left(\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)-\text{lo}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^3/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] -((Sec[c + d*x]^2*(Cos[(c + d*x)/2]*(2*I + Log[Cos[(c + d*x)/2] - Sin[(c +
d*x)/2]] - Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]) + (2 + I*Log[Cos[(c +
d*x)/2] - Sin[(c + d*x)/2]] - I*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]])*S
in[(c + d*x)/2])*(Cos[(3*(c + d*x))/2] + I*Sin[(3*(c + d*x))/2]))/(a^2*d*(-
I + Tan[c + d*x])^2))
```

fricas [A] time = 0.58, size = 64, normalized size = 1.33

$$-\frac{\left(e^{(i\,dx+i\,c)}\log\left(e^{(i\,dx+i\,c)}+i\right)-e^{(i\,dx+i\,c)}\log\left(e^{(i\,dx+i\,c)}-i\right)-2i\right)e^{(-i\,dx-i\,c)}}{a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -(e^(I*d*x + I*c)*log(e^(I*d*x + I*c) + I) - e^(I*d*x + I*c)*log(e^(I*d*x +
 I*c) - I) - 2*I)*e^(-I*d*x - I*c)/(a^2*d)
```

giac [A] time = 1.03, size = 57, normalized size = 1.19

$$-\frac{\frac{\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^2}-\frac{\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)}{a^2}-\frac{4}{a^2\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [A] time = 0.41, size = 63, normalized size = 1.31

$$\frac{4}{a^2d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)}+\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^2d}-\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 4/a^2/d/(tan(1/2*d*x+1/2*c)-I)+1/a^2/d*ln(tan(1/2*d*x+1/2*c)-1)-1/a^2/d*ln(
tan(1/2*d*x+1/2*c)+1)
```

maxima [B] time = 0.64, size = 117, normalized size = 2.44

$$-\frac{-2i\,\arctan\left(\cos\left(dx+c\right),\sin\left(dx+c\right)+1\right)-2i\,\arctan\left(\cos\left(dx+c\right),-\sin\left(dx+c\right)+1\right)-4i\,\cos\left(dx+c\right)+\mathrm{l}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*(-2*I*arctan2(cos(d*x + c), sin(d*x + c) + 1) - 2*I*arctan2(cos(d*x +
c), -sin(d*x + c) + 1) - 4*I*cos(d*x + c) + log(cos(d*x + c)^2 + sin(d*x +
c)^2 + 2*sin(d*x + c) + 1) - log(cos(d*x + c)^2 + sin(d*x + c)^2 - 2*sin(d*
x + c) + 1) - 4*sin(d*x + c))/(a^2*d)
```

mupad [B] time = 3.50, size = 44, normalized size = 0.92

$$-\frac{2\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{a^2\,d}+\frac{4\mathrm{i}}{a^2\,d\,\left(1+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,1\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^2),x)
```

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

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

$$-\frac{\int \frac{\sec^3(c+dx)}{\tan^2(c+dx)-2i\tan(c+dx)-1}\,dx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -Integral(sec(c + d*x)**3/(tan(c + d*x)**2 - 2*I*tan(c + d*x) - 1), x)/a**2
```

3.126 $\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=65

$$\frac{i\sec(c+dx)}{3d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{i\sec(c+dx)}{3d(a+ia\tan(c+dx))^2}$$

```
[Out] 1/3*I*sec(d*x+c)/d/(a+I*a*tan(d*x+c))^2+1/3*I*sec(d*x+c)/d/(a^2+I*a^2*tan(d
*x+c))
```

Rubi [A] time = 0.05, antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {3502, 3488}

$$\frac{i\sec(c+dx)}{3d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{i\sec(c+dx)}{3d(a+ia\tan(c+dx))^2}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] ((I/3)*Sec[c + d*x])/(d*(a + I*a*Tan[c + d*x])^2) + ((I/3)*Sec[c + d*x])/(d
*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3502

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

Rubi steps

$$\begin{aligned}\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^2}\,dx &= \frac{i\sec(c+dx)}{3d(a+ia\tan(c+dx))^2}+\frac{\int \frac{\sec(c+dx)}{a+ia\tan(c+dx)}\,dx}{3a}\\ &= \frac{i\sec(c+dx)}{3d(a+ia\tan(c+dx))^2}+\frac{i\sec(c+dx)}{3d\left(a^2+ia^2\tan(c+dx)\right)}\end{aligned}$$

Mathematica [A] time = 0.11, size = 38, normalized size = 0.58

$$\frac{(\tan(c+dx)-2i)\sec(c+dx)}{3a^2d(\tan(c+dx)-i)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (Sec[c + d*x]*(-2*I + Tan[c + d*x]))/(3*a^2*d*(-I + Tan[c + d*x])^2)
```

fricas [A] time = 0.54, size = 30, normalized size = 0.46

$$\frac{\left(3 i e^{(2 i dx+2 i c)}+i\right) e^{(-3 i dx-3 i c)}}{6 a^{2} d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/6*(3*I*e^(2*I*d*x + 2*I*c) + I)*e^(-3*I*d*x - 3*I*c)/(a^2*d)
```

giac [A] time = 0.83, size = 47, normalized size = 0.72

$$\frac{2 \left(3 \tan \left(\frac{1}{2} dx+\frac{1}{2} c\right)^{2}-3 i \tan \left(\frac{1}{2} dx+\frac{1}{2} c\right)-2\right)}{3 a^{2} d \left(\tan \left(\frac{1}{2} dx+\frac{1}{2} c\right)-i\right)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

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

maple [A] time = 0.22, size = 57, normalized size = 0.88

$$\frac{\frac{2}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i}-\frac{4}{3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{3}}+\frac{2 i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{2}}}{a^{2} d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)/(a+I*a*tan(d*x+c))^2,x)
```

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

maxima [A] time = 0.48, size = 45, normalized size = 0.69

$$\frac{i \cos \left(3 dx+3 c\right)+3 i \cos \left(dx+c\right)+\sin \left(3 dx+3 c\right)+3 \sin \left(dx+c\right)}{6 a^{2} d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/6*(I*cos(3*d*x + 3*c) + 3*I*cos(d*x + c) + sin(3*d*x + 3*c) + 3*sin(d*x +
 c))/(a^2*d)
```

mupad [B] time = 3.51, size = 79, normalized size = 1.22

$$-\frac{2 \left(\tan\left(\frac{c}{2}+\frac{d x}{2}\right)^{2} 3\mathrm{i}+3 \tan\left(\frac{c}{2}+\frac{d x}{2}\right)-2\mathrm{i}\right)}{3 a^{2} d \left(-\tan\left(\frac{c}{2}+\frac{d x}{2}\right)^{3} 1\mathrm{i}-3 \tan\left(\frac{c}{2}+\frac{d x}{2}\right)^{2}+\tan\left(\frac{c}{2}+\frac{d x}{2}\right) 3\mathrm{i}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^2),x)
```

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

sympy [A] time = 1.20, size = 112, normalized size = 1.72

$$\begin{cases} -\frac{\tan\left(c+dx\right)\sec\left(c+dx\right)}{-3a^2d\tan^2\left(c+dx\right)+6ia^2d\tan\left(c+dx\right)+3a^2d} + \frac{2i\sec\left(c+dx\right)}{-3a^2d\tan^2\left(c+dx\right)+6ia^2d\tan\left(c+dx\right)+3a^2d} & \text{for } d \neq 0 \\ \frac{x\sec\left(c\right)}{\left(ia\tan\left(c\right)+a\right)^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Piecewise((-tan(c + d*x)*sec(c + d*x)/(-3*a**2*d*tan(c + d*x)**2 + 6*I*a**2
*d*tan(c + d*x) + 3*a**2*d) + 2*I*sec(c + d*x)/(-3*a**2*d*tan(c + d*x)**2 +
 6*I*a**2*d*tan(c + d*x) + 3*a**2*d), Ne(d, 0)), (x*sec(c)/(I*a*tan(c) + a)
**2, True))
```

3.127 $\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=71

$$-\frac{\sin^3(c+dx)}{5a^2d}+\frac{3\sin(c+dx)}{5a^2d}+\frac{2i\cos^3(c+dx)}{5d\left(a^2+ia^2\tan(c+dx)\right)}$$

```
[Out] 3/5*sin(d*x+c)/a^2/d-1/5*sin(d*x+c)^3/a^2/d+2/5*I*cos(d*x+c)^3/d/(a^2+I*a^2
*tan(d*x+c))
```

Rubi [A] time = 0.05, antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {3500, 2633}

$$-\frac{\sin^3(c+dx)}{5a^2d}+\frac{3\sin(c+dx)}{5a^2d}+\frac{2i\cos^3(c+dx)}{5d\left(a^2+ia^2\tan(c+dx)\right)}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (3*Sin[c + d*x])/(5*a^2*d) - Sin[c + d*x]^3/(5*a^2*d) + (((2*I)/5)*Cos[c +
d*x]^3)/(d*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rubi steps

$$\begin{aligned}
\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^2}\,dx &= \frac{2i\cos^3(c+dx)}{5d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{3\int\cos^3(c+dx)\,dx}{5a^2}\\
&= \frac{2i\cos^3(c+dx)}{5d\left(a^2+ia^2\tan(c+dx)\right)}-\frac{3\,\text{Subst}\left(\int\left(1-x^2\right)\,dx,x,-\sin(c+dx)\right)}{5a^2d}\\
&= \frac{3\sin(c+dx)}{5a^2d}-\frac{\sin^3(c+dx)}{5a^2d}+\frac{2i\cos^3(c+dx)}{5d\left(a^2+ia^2\tan(c+dx)\right)}
\end{aligned}$$

Mathematica [A] time = 0.33, size = 68, normalized size = 0.96

$$\frac{\sec(c+dx)(4i\cos(2(c+dx))+5\tan(c+dx)-3\sin(3(c+dx))\sec(c+dx)-12i)}{20a^2d(\tan(c+dx)-i)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (Sec[c + d*x]*(-12*I + (4*I)*Cos[2*(c + d*x)] - 3*Sec[c + d*x]*Sin[3*(c + d
*x)] + 5*Tan[c + d*x]))/(20*a^2*d*(-I + Tan[c + d*x])^2)
```

fricas [A] time = 0.68, size = 52, normalized size = 0.73

$$\frac{\left(-5i\,e^{(6i\,dx+6i\,c)}+15i\,e^{(4i\,dx+4i\,c)}+5i\,e^{(2i\,dx+2i\,c)}+i\right)e^{(-5i\,dx-5i\,c)}}{40\,a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/40*(-5*I*e^(6*I*d*x + 6*I*c) + 15*I*e^(4*I*d*x + 4*I*c) + 5*I*e^(2*I*d*x
+ 2*I*c) + I)*e^(-5*I*d*x - 5*I*c)/(a^2*d)
```

giac [A] time = 1.62, size = 93, normalized size = 1.31

$$\frac{\frac{5}{a^2\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+i\right)}+\frac{35\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^4-90i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3-120\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+70i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+21}{a^2\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)^5}}{20\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/20*(5/(a^2*(tan(1/2*d*x + 1/2*c) + I)) + (35*tan(1/2*d*x + 1/2*c)^4 - 90*
I*tan(1/2*d*x + 1/2*c)^3 - 120*tan(1/2*d*x + 1/2*c)^2 + 70*I*tan(1/2*d*x +
1/2*c) + 21)/(a^2*(tan(1/2*d*x + 1/2*c) - I)^5))/d
```

maple [A] time = 0.42, size = 108, normalized size = 1.52

$$\frac{\frac{2}{8\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+8i}-\frac{2i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^4}+\frac{5i}{2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^2}+\frac{4}{5\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^5}-\frac{3}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^3}+\frac{7}{4\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)}}{a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 2/d/a^2*(1/8/(tan(1/2*d*x+1/2*c)+I)-I/(tan(1/2*d*x+1/2*c)-I)^4+5/4*I/(tan(1
/2*d*x+1/2*c)-I)^2+2/5/(tan(1/2*d*x+1/2*c)-I)^5-3/2/(tan(1/2*d*x+1/2*c)-I)^
3+7/8/(tan(1/2*d*x+1/2*c)-I))
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 3.89, size = 90, normalized size = 1.27

$$-\frac{2\left(-5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4 10\mathrm{i}+10\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3+3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)-2\mathrm{i}\right)}{5\,a^2\,d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)-\mathrm{i}\right)^5\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+1\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)/(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] -(2*(3*tan(c/2 + (d*x)/2) + 10*tan(c/2 + (d*x)/2)^3 + tan(c/2 + (d*x)/2)^4*
10i - 5*tan(c/2 + (d*x)/2)^5 - 2i))/(5*a^2*d*(tan(c/2 + (d*x)/2) - 1i)^5*(t
an(c/2 + (d*x)/2) + 1i))
```

sympy [A] time = 0.40, size = 165, normalized size = 2.32

$$\begin{cases} \frac{\left(-2560ia^6d^3e^{10ic}e^{idx}+7680ia^6d^3e^{8ic}e^{-idx}+2560ia^6d^3e^{6ic}e^{-3idx}+512ia^6d^3e^{4ic}e^{-5idx}\right)e^{-9ic}}{20480a^8d^4} & \text{for } 20480a^8d^4e^{9ic} \neq 0 \\ \frac{x\left(e^{6ic}+3e^{4ic}+3e^{2ic}+1\right)e^{-5ic}}{8a^2} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Piecewise(((-2560*I*a**6*d**3*exp(10*I*c)*exp(I*d*x) + 7680*I*a**6*d**3*exp
(8*I*c)*exp(-I*d*x) + 2560*I*a**6*d**3*exp(6*I*c)*exp(-3*I*d*x) + 512*I*a**
6*d**3*exp(4*I*c)*exp(-5*I*d*x))*exp(-9*I*c)/(20480*a**8*d**4), Ne(20480*a*
*8*d**4*exp(9*I*c), 0)), (x*(exp(6*I*c) + 3*exp(4*I*c) + 3*exp(2*I*c) + 1)*
exp(-5*I*c)/(8*a**2), True))
```

3.128 $\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=89

$$\frac{\sin^5(c+dx)}{7a^2d}-\frac{10\sin^3(c+dx)}{21a^2d}+\frac{5\sin(c+dx)}{7a^2d}+\frac{2i\cos^5(c+dx)}{7d\left(a^2+ia^2\tan(c+dx)\right)}$$

```
[Out] 5/7*sin(d*x+c)/a^2/d-10/21*sin(d*x+c)^3/a^2/d+1/7*sin(d*x+c)^5/a^2/d+2/7*I*
cos(d*x+c)^5/d/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.06, antiderivative size = 89, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3500, 2633}

$$\frac{\sin^5(c+dx)}{7a^2d}-\frac{10\sin^3(c+dx)}{21a^2d}+\frac{5\sin(c+dx)}{7a^2d}+\frac{2i\cos^5(c+dx)}{7d\left(a^2+ia^2\tan(c+dx)\right)}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (5*Sin[c + d*x])/(7*a^2*d) - (10*Sin[c + d*x]^3)/(21*a^2*d) + Sin[c + d*x]^
5/(7*a^2*d) + (((2*I)/7)*Cos[c + d*x]^5)/(d*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rubi steps

$$\begin{aligned}\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx))^2}\,dx &= \frac{2i\cos^5(c+dx)}{7d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{5\int \cos^5(c+dx)\,dx}{7a^2}\\ &= \frac{2i\cos^5(c+dx)}{7d\left(a^2+ia^2\tan(c+dx)\right)}-\frac{5\,\text{Subst}\left(\int \left(1-2x^2+x^4\right)\,dx,x,-\sin(c+dx)\right)}{7a^2d}\\ &= \frac{5\sin(c+dx)}{7a^2d}-\frac{10\sin^3(c+dx)}{21a^2d}+\frac{\sin^5(c+dx)}{7a^2d}+\frac{2i\cos^5(c+dx)}{7d\left(a^2+ia^2\tan(c+dx)\right)}\end{aligned}$$

Mathematica [A] time = 0.24, size = 95, normalized size = 1.07

$$\frac{i\sec^2(c+dx)(-70i\sin(c+dx)+63i\sin(3(c+dx))+5i\sin(5(c+dx))-140\cos(c+dx)+42\cos(3(c+dx))}{336a^2d(\tan(c+dx)-i)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] ((I/336)*Sec[c + d*x]^2*(-140*Cos[c + d*x] + 42*Cos[3*(c + d*x)] + 2*Cos[5*
(c + d*x)] - (70*I)*Sin[c + d*x] + (63*I)*Sin[3*(c + d*x)] + (5*I)*Sin[5*(c
 + d*x)]))/(a^2*d*(-I + Tan[c + d*x])^2)
```

fricas [A] time = 0.60, size = 74, normalized size = 0.83

$$\frac{\left(-7 i e^{(10 i dx+10 i c)}-105 i e^{(8 i dx+8 i c)}+210 i e^{(6 i dx+6 i c)}+70 i e^{(4 i dx+4 i c)}+21 i e^{(2 i dx+2 i c)}+3 i\right) e^{(-7 i dx-7 i c)}}{672 a^2 d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/672*(-7*I*e^(10*I*d*x + 10*I*c) - 105*I*e^(8*I*d*x + 8*I*c) + 210*I*e^(6*
I*d*x + 6*I*c) + 70*I*e^(4*I*d*x + 4*I*c) + 21*I*e^(2*I*d*x + 2*I*c) + 3*I)
*e^(-7*I*d*x - 7*I*c)/(a^2*d)
```

giac [A] time = 0.93, size = 145, normalized size = 1.63

$$\frac{\frac{7\left(9 \tan\left(\frac{1}{2} dx+\frac{1}{2} c\right)^2+15 i \tan\left(\frac{1}{2} dx+\frac{1}{2} c\right)-8\right)}{a^2\left(\tan\left(\frac{1}{2} dx+\frac{1}{2} c\right)+i\right)^3}+\frac{273 \tan\left(\frac{1}{2} dx+\frac{1}{2} c\right)^6-1155 i \tan\left(\frac{1}{2} dx+\frac{1}{2} c\right)^5-2450 \tan\left(\frac{1}{2} dx+\frac{1}{2} c\right)^4+2870 i \tan\left(\frac{1}{2} dx+\frac{1}{2} c\right)^3+2037 \tan}{a^2\left(\tan\left(\frac{1}{2} dx+\frac{1}{2} c\right)-i\right)^7}}{168 d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/168*(7*(9*tan(1/2*d*x + 1/2*c)^2 + 15*I*tan(1/2*d*x + 1/2*c) - 8)/(a^2*(t
an(1/2*d*x + 1/2*c) + I)^3) + (273*tan(1/2*d*x + 1/2*c)^6 - 1155*I*tan(1/2*
d*x + 1/2*c)^5 - 2450*tan(1/2*d*x + 1/2*c)^4 + 2870*I*tan(1/2*d*x + 1/2*c)^
3 + 2037*tan(1/2*d*x + 1/2*c)^2 - 791*I*tan(1/2*d*x + 1/2*c) - 152)/(a^2*(t
an(1/2*d*x + 1/2*c) - I)^7))/d
```

maple [B] time = 0.43, size = 174, normalized size = 1.96

$$\frac{-\frac{i}{8\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^2}-\frac{1}{12\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^3}+\frac{3}{8\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)}+\frac{2 i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^6}-\frac{5 i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^4}+\frac{23 i}{8\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^2}-\frac{4}{7\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right.}}{a^2 d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 2/d/a^2*(-1/16*I/(tan(1/2*d*x+1/2*c)+I)^2-1/24/(tan(1/2*d*x+1/2*c)+I)^3+3/1
6/(tan(1/2*d*x+1/2*c)+I)+I/(tan(1/2*d*x+1/2*c)-I)^6-5/2*I/(tan(1/2*d*x+1/2*
c)-I)^4+23/16*I/(tan(1/2*d*x+1/2*c)-I)^2-2/7/(tan(1/2*d*x+1/2*c)-I)^7+2/(ta
n(1/2*d*x+1/2*c)-I)^5-55/24/(tan(1/2*d*x+1/2*c)-I)^3+13/16/(tan(1/2*d*x+1/2
*c)-I))
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 6.87, size = 161, normalized size = 1.81

$$\frac{\left(-21\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8 42\mathrm{i}+28\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6 56\mathrm{i}+42\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5+\tan\left(\frac{c}{2}+\right.\right.}{21\,a^2\,d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+1\mathrm{i}\right)^3\left(1+\tan\left(\frac{c}{2}+\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3/(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] ((3*tan(c/2 + (d*x)/2) - tan(c/2 + (d*x)/2)^2*24i + 76*tan(c/2 + (d*x)/2)^3
 + tan(c/2 + (d*x)/2)^4*28i + 42*tan(c/2 + (d*x)/2)^5 + tan(c/2 + (d*x)/2)^
6*56i + 28*tan(c/2 + (d*x)/2)^7 + tan(c/2 + (d*x)/2)^8*42i - 21*tan(c/2 + (
d*x)/2)^9 - 6i)*2i)/(21*a^2*d*(tan(c/2 + (d*x)/2) + 1i)^3*(tan(c/2 + (d*x)/
2)*1i + 1)^7)
```

sympy [A] time = 0.59, size = 233, normalized size = 2.62

$$\begin{cases} \frac{\left(-176160768ia^{10}d^5e^{19ic}e^{3idx}-2642411520ia^{10}d^5e^{17ic}e^{idx}+5284823040ia^{10}d^5e^{15ic}e^{-idx}+1761607680ia^{10}d^5e^{13ic}e^{-3idx}+528482304ia^{10}d^5e^{11ic}e^{-5idx}\right.}{16911433728a^{12}d^6} \\ \frac{x\left(e^{10ic}+5e^{8ic}+10e^{6ic}+10e^{4ic}+5e^{2ic}+1\right)e^{-7ic}}{32a^2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Piecewise(((-176160768*I*a**10*d**5*exp(19*I*c)*exp(3*I*d*x) - 2642411520*I
*a**10*d**5*exp(17*I*c)*exp(I*d*x) + 5284823040*I*a**10*d**5*exp(15*I*c)*ex
p(-I*d*x) + 1761607680*I*a**10*d**5*exp(13*I*c)*exp(-3*I*d*x) + 528482304*I
*a**10*d**5*exp(11*I*c)*exp(-5*I*d*x) + 75497472*I*a**10*d**5*exp(9*I*c)*ex
p(-7*I*d*x))*exp(-16*I*c)/(16911433728*a**12*d**6), Ne(16911433728*a**12*d*
*6*exp(16*I*c), 0)), (x*(exp(10*I*c) + 5*exp(8*I*c) + 10*exp(6*I*c) + 10*ex
p(4*I*c) + 5*exp(2*I*c) + 1)*exp(-7*I*c)/(32*a**2), True))
```

3.129 $\int \frac{\cos^5(c+dx)}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=107

$$-\frac{\sin^7(c+dx)}{9a^2d}+\frac{7\sin^5(c+dx)}{15a^2d}-\frac{7\sin^3(c+dx)}{9a^2d}+\frac{7\sin(c+dx)}{9a^2d}+\frac{2i\cos^7(c+dx)}{9d\left(a^2+ia^2\tan(c+dx)\right)}$$

```
[Out] 7/9*sin(d*x+c)/a^2/d-7/9*sin(d*x+c)^3/a^2/d+7/15*sin(d*x+c)^5/a^2/d-1/9*sin
(d*x+c)^7/a^2/d+2/9*I*cos(d*x+c)^7/d/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.06, antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3500, 2633}

$$-\frac{\sin^7(c+dx)}{9a^2d}+\frac{7\sin^5(c+dx)}{15a^2d}-\frac{7\sin^3(c+dx)}{9a^2d}+\frac{7\sin(c+dx)}{9a^2d}+\frac{2i\cos^7(c+dx)}{9d\left(a^2+ia^2\tan(c+dx)\right)}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^5/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (7*Sin[c + d*x])/(9*a^2*d) - (7*Sin[c + d*x]^3)/(9*a^2*d) + (7*Sin[c + d*x]
^5)/(15*a^2*d) - Sin[c + d*x]^7/(9*a^2*d) + (((2*I)/9)*Cos[c + d*x]^7)/(d*(
a^2 + I*a^2*Tan[c + d*x]))
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rubi steps

$$\begin{aligned}\int \frac{\cos^5(c+dx)}{(a+ia\tan(c+dx))^2}\,dx &= \frac{2i\cos^7(c+dx)}{9d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{7\int \cos^7(c+dx)\,dx}{9a^2}\\ &= \frac{2i\cos^7(c+dx)}{9d\left(a^2+ia^2\tan(c+dx)\right)}-\frac{7\,\text{Subst}\left(\int \left(1-3x^2+3x^4-x^6\right)\,dx,x,-\sin(c+dx)\right)}{9a^2d}\\ &= \frac{7\sin(c+dx)}{9a^2d}-\frac{7\sin^3(c+dx)}{9a^2d}+\frac{7\sin^5(c+dx)}{15a^2d}-\frac{\sin^7(c+dx)}{9a^2d}+\frac{2i\cos^7(c+a}{9d\left(a^2+ia^2\tan(c\right.}\end{aligned}$$

Mathematica [A] time = 0.48, size = 117, normalized size = 1.09

$$\frac{i\sec^2(c+dx)(-525i\sin(c+dx)+567i\sin(3(c+dx))+75i\sin(5(c+dx))+7i\sin(7(c+dx))-1050\cos(c+dx)}{2880a^2d(\tan(c+dx)-i)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^5/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] ((I/2880)*Sec[c + d*x]^2*(-1050*Cos[c + d*x] + 378*Cos[3*(c + d*x)] + 30*Co
s[5*(c + d*x)] + 2*Cos[7*(c + d*x)] - (525*I)*Sin[c + d*x] + (567*I)*Sin[3*
(c + d*x)] + (75*I)*Sin[5*(c + d*x)] + (7*I)*Sin[7*(c + d*x)]))/(a^2*d*(-I
+ Tan[c + d*x])^2)
```

fricas [A] time = 0.58, size = 96, normalized size = 0.90

$$\frac{\left(-9i\,e^{(14i\,dx+14i\,c)} - 105i\,e^{(12i\,dx+12i\,c)} - 945i\,e^{(10i\,dx+10i\,c)} + 1575i\,e^{(8i\,dx+8i\,c)} + 525i\,e^{(6i\,dx+6i\,c)} + 189i\,e^{(4i\,dx+4i\,c)} + 4\right.}{5760\,a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/5760*(-9*I*e^(14*I*d*x + 14*I*c) - 105*I*e^(12*I*d*x + 12*I*c) - 945*I*e^
(10*I*d*x + 10*I*c) + 1575*I*e^(8*I*d*x + 8*I*c) + 525*I*e^(6*I*d*x + 6*I*c
) + 189*I*e^(4*I*d*x + 4*I*c) + 45*I*e^(2*I*d*x + 2*I*c) + 5*I)*e^(-9*I*d*x
 - 9*I*c)/(a^2*d)
```

giac [B] time = 1.03, size = 197, normalized size = 1.84

$$\frac{\frac{3\left(435\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^4+1470i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3-2060\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1330i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+353\right)}{a^2\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+i\right)^5}+\frac{4455\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^8-26460i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\right.}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2880*(3*(435*tan(1/2*d*x + 1/2*c)^4 + 1470*I*tan(1/2*d*x + 1/2*c)^3 - 206
0*tan(1/2*d*x + 1/2*c)^2 - 1330*I*tan(1/2*d*x + 1/2*c) + 353)/(a^2*(tan(1/2
*d*x + 1/2*c) + I)^5) + (4455*tan(1/2*d*x + 1/2*c)^8 - 26460*I*tan(1/2*d*x
+ 1/2*c)^7 - 78120*tan(1/2*d*x + 1/2*c)^6 + 137340*I*tan(1/2*d*x + 1/2*c)^5
 + 157374*tan(1/2*d*x + 1/2*c)^4 - 118356*I*tan(1/2*d*x + 1/2*c)^3 - 57744*
tan(1/2*d*x + 1/2*c)^2 + 16596*I*tan(1/2*d*x + 1/2*c) + 2339)/(a^2*(tan(1/2
*d*x + 1/2*c) - I)^9))/d
```

maple [B] time = 0.42, size = 240, normalized size = 2.24

$$\frac{\frac{i}{8\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^4}-\frac{9i}{32\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^2}+\frac{1}{20\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^5}-\frac{13}{48\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^3}+\frac{29}{64\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)}-\frac{2i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^8}+\frac{5}{16\left(\tan\right.}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^5/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 2/d/a^2*(1/16*I/(tan(1/2*d*x+1/2*c)+I)^4-9/64*I/(tan(1/2*d*x+1/2*c)+I)^2+1/
40/(tan(1/2*d*x+1/2*c)+I)^5-13/96/(tan(1/2*d*x+1/2*c)+I)^3+29/128/(tan(1/2*
d*x+1/2*c)+I)-I/(tan(1/2*d*x+1/2*c)-I)^8+51/32*I/(tan(1/2*d*x+1/2*c)-I)^2+4
9/12*I/(tan(1/2*d*x+1/2*c)-I)^6-35/8*I/(tan(1/2*d*x+1/2*c)-I)^4+2/9/(tan(1/
2*d*x+1/2*c)-I)^9-5/2/(tan(1/2*d*x+1/2*c)-I)^7+49/10/(tan(1/2*d*x+1/2*c)-I)
^5-49/16/(tan(1/2*d*x+1/2*c)-I)^3+99/128/(tan(1/2*d*x+1/2*c)-I))
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 5.65, size = 216, normalized size = 2.02

$$\frac{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)\left(\frac{191\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{16}-\frac{1289\,\sin\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)}{64}+\frac{649\,\sin\left(\frac{5\,c}{2}+\frac{5\,d\,x}{2}\right)}{64}-\frac{41\,\sin\left(\frac{7\,c}{2}+\frac{7\,d\,x}{2}\right)}{32}+\frac{41\,\sin\left(\frac{9\,c}{2}+\frac{9\,d\,x}{2}\right)}{32}-\frac{7\,\sin\left(\frac{11\,c}{2}+\frac{11\,d\,x}{2}\right)}{64}+\cdots}{45\,a^2\,d\left(\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)+\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^5/(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] (cos(c/2 + (d*x)/2)*((cos((3*c)/2 + (3*d*x)/2)*525i)/32 - (cos((5*c)/2 + (5
*d*x)/2)*205i)/32 + (cos((7*c)/2 + (7*d*x)/2)*1i)/2 - (cos((9*c)/2 + (9*d*x
)/2)*1i)/2 + (cos((11*c)/2 + (11*d*x)/2)*1i)/32 - (cos((13*c)/2 + (13*d*x)/
2)*1i)/32 + (191*sin(c/2 + (d*x)/2))/16 - (1289*sin((3*c)/2 + (3*d*x)/2))/6
4 + (649*sin((5*c)/2 + (5*d*x)/2))/64 - (41*sin((7*c)/2 + (7*d*x)/2))/32 +
(41*sin((9*c)/2 + (9*d*x)/2))/32 - (7*sin((11*c)/2 + (11*d*x)/2))/64 + (7*s
in((13*c)/2 + (13*d*x)/2))/64)*2i)/(45*a^2*d*(cos(c/2 + (d*x)/2) + sin(c/2
+ (d*x)/2)*1i)^9*(cos(c/2 + (d*x)/2)*1i + sin(c/2 + (d*x)/2))^5)
```

sympy [A] time = 0.76, size = 301, normalized size = 2.81

$$\begin{cases} \frac{\left(-227994731135631360ia^{14}d^7e^{30ic}e^{5idx}-2659938529915699200ia^{14}d^7e^{28ic}e^{3idx}-23939446769241292800ia^{14}d^7e^{26ic}e^{idx}+39899077948735488000ia^{14}\cdots\right.}{\cdots} \\ \frac{x\left(e^{14ic}+7e^{12ic}+21e^{10ic}+35e^{8ic}+35e^{6ic}+21e^{4ic}+7e^{2ic}+1\right)e^{-9ic}}{128a^2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**5/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Piecewise(((-227994731135631360*I*a**14*d**7*exp(30*I*c)*exp(5*I*d*x) - 265
9938529915699200*I*a**14*d**7*exp(28*I*c)*exp(3*I*d*x) - 239394467692412928
00*I*a**14*d**7*exp(26*I*c)*exp(I*d*x) + 39899077948735488000*I*a**14*d**7*
exp(24*I*c)*exp(-I*d*x) + 13299692649578496000*I*a**14*d**7*exp(22*I*c)*exp
(-3*I*d*x) + 4787889353848258560*I*a**14*d**7*exp(20*I*c)*exp(-5*I*d*x) + 1
139973655678156800*I*a**14*d**7*exp(18*I*c)*exp(-7*I*d*x) + 126663739519795
200*I*a**14*d**7*exp(16*I*c)*exp(-9*I*d*x))*exp(-25*I*c)/(1459166279268040
70400*a**16*d**8), Ne(145916627926804070400*a**16*d**8*exp(25*I*c), 0)), (x*
(exp(14*I*c) + 7*exp(12*I*c) + 21*exp(10*I*c) + 35*exp(8*I*c) + 35*exp(6*I*
c) + 21*exp(4*I*c) + 7*exp(2*I*c) + 1)*exp(-9*I*c)/(128*a**2), True))
```

3.130 $\int \frac{\sec^{14}(c+dx)}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=109

$$-\frac{i(a-ia\tan(c+dx))^{10}}{10a^{13}d}+\frac{2i(a-ia\tan(c+dx))^9}{3a^{12}d}-\frac{3i(a-ia\tan(c+dx))^8}{2a^{11}d}+\frac{8i(a-ia\tan(c+dx))^7}{7a^{10}d}$$

```
[Out] 8/7*I*(a-I*a*tan(d*x+c))^7/a^10/d-3/2*I*(a-I*a*tan(d*x+c))^8/a^11/d+2/3*I*(
a-I*a*tan(d*x+c))^9/a^12/d-1/10*I*(a-I*a*tan(d*x+c))^10/a^13/d
```

Rubi [A] time = 0.07, antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$-\frac{i(a-ia\tan(c+dx))^{10}}{10a^{13}d}+\frac{2i(a-ia\tan(c+dx))^9}{3a^{12}d}-\frac{3i(a-ia\tan(c+dx))^8}{2a^{11}d}+\frac{8i(a-ia\tan(c+dx))^7}{7a^{10}d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^14/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (((8*I)/7)*(a - I*a*Tan[c + d*x])^7)/(a^10*d) - (((3*I)/2)*(a - I*a*Tan[c +
 d*x])^8)/(a^11*d) + (((2*I)/3)*(a - I*a*Tan[c + d*x])^9)/(a^12*d) - ((I/10
)*(a - I*a*Tan[c + d*x])^10)/(a^13*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^{14}(c+dx)}{(a+ia\tan(c+dx))^3}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^6(a+x)^3\,dx,x,ia\tan(c+dx)\right)}{a^{13}d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(8a^3(a-x)^6-12a^2(a-x)^7+6a(a-x)^8-(a-x)^9\right)dx,x,ia\tan(c+\right.}{a^{13}d}\\ &= \frac{8i(a-ia\tan(c+dx))^7}{7a^{10}d}-\frac{3i(a-ia\tan(c+dx))^8}{2a^{11}d}+\frac{2i(a-ia\tan(c+dx))^9}{3a^{12}d}-\frac{i(a\end{aligned}$$

Mathematica [A] time = 1.02, size = 117, normalized size = 1.07

$$\frac{\sec(c)\sec^{10}(c+dx)(105\sin(c+2dx)-105\sin(3c+2dx)+120\sin(3c+4dx)+45\sin(5c+6dx)+10\sin(7c}{840a^3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^14/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (Sec[c]*Sec[c + d*x]^10*((-126*I)*Cos[c] - (105*I)*Cos[c + 2*d*x] - (105*I)
*Cos[3*c + 2*d*x] - 126*Sin[c] + 105*Sin[c + 2*d*x] - 105*Sin[3*c + 2*d*x]
+ 120*Sin[3*c + 4*d*x] + 45*Sin[5*c + 6*d*x] + 10*Sin[7*c + 8*d*x] + Sin[9*
c + 10*d*x]))/(840*a^3*d)
```

fricas [B] time = 0.56, size = 194, normalized size = 1.78

$$\frac{15360i\,e^{(6i\,dx+6i\,c)}+5760i\,e^{(4i\,dx+4i\,c)}+\cdots}{105\left(a^3de^{(20i\,dx+20i\,c)}+10\,a^3de^{(18i\,dx+18i\,c)}+45\,a^3de^{(16i\,dx+16i\,c)}+120\,a^3de^{(14i\,dx+14i\,c)}+210\,a^3de^{(12i\,dx+12i\,c)}+252\,a^3\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^14/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/105*(15360*I*e^(6*I*d*x + 6*I*c) + 5760*I*e^(4*I*d*x + 4*I*c) + 1280*I*e^
(2*I*d*x + 2*I*c) + 128*I)/(a^3*d*e^(20*I*d*x + 20*I*c) + 10*a^3*d*e^(18*I*
d*x + 18*I*c) + 45*a^3*d*e^(16*I*d*x + 16*I*c) + 120*a^3*d*e^(14*I*d*x + 14
*I*c) + 210*a^3*d*e^(12*I*d*x + 12*I*c) + 252*a^3*d*e^(10*I*d*x + 10*I*c) +
 210*a^3*d*e^(8*I*d*x + 8*I*c) + 120*a^3*d*e^(6*I*d*x + 6*I*c) + 45*a^3*d*e
^(4*I*d*x + 4*I*c) + 10*a^3*d*e^(2*I*d*x + 2*I*c) + a^3*d)
```

giac [A] time = 2.36, size = 87, normalized size = 0.80

$$-\frac{-21i\,\tan\left(dx+c\right)^{10}+70\,\tan\left(dx+c\right)^{9}+240\,\tan\left(dx+c\right)^{7}+210i\,\tan\left(dx+c\right)^{6}+252\,\tan\left(dx+c\right)^{5}+420i\,\tan\cdots}{210\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^14/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -1/210*(-21*I*tan(d*x + c)^10 + 70*tan(d*x + c)^9 + 240*tan(d*x + c)^7 + 21
0*I*tan(d*x + c)^6 + 252*tan(d*x + c)^5 + 420*I*tan(d*x + c)^4 + 315*I*tan(
d*x + c)^2 - 210*tan(d*x + c))/(a^3*d)
```

maple [A] time = 0.45, size = 89, normalized size = 0.82

$$\frac{\tan\left(dx+c\right)+\frac{i\left(\tan^{10}(dx+c)\right)}{10}-\frac{\left(\tan^{9}(dx+c)\right)}{3}-\frac{8\left(\tan^{7}(dx+c)\right)}{7}-i\left(\tan^{6}\left(dx+c\right)\right)-\frac{6\left(\tan^{5}(dx+c)\right)}{5}-2i\left(\tan^{4}\left(dx+c\right)\right)-\frac{3i\left(\tan\cdots\right.}{}}{d\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^14/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 1/d/a^3*(tan(d*x+c)+1/10*I*tan(d*x+c)^10-1/3*tan(d*x+c)^9-8/7*tan(d*x+c)^7-
I*tan(d*x+c)^6-6/5*tan(d*x+c)^5-2*I*tan(d*x+c)^4-3/2*I*tan(d*x+c)^2)
```

maxima [A] time = 0.45, size = 87, normalized size = 0.80

$$\frac{42i\,\tan\left(dx+c\right)^{10}-140\,\tan\left(dx+c\right)^{9}-480\,\tan\left(dx+c\right)^{7}-420i\,\tan\left(dx+c\right)^{6}-504\,\tan\left(dx+c\right)^{5}-840i\,\tan\left(d\cdots\right.}{420\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^14/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/420*(42*I*tan(d*x + c)^10 - 140*tan(d*x + c)^9 - 480*tan(d*x + c)^7 - 420
*I*tan(d*x + c)^6 - 504*tan(d*x + c)^5 - 840*I*tan(d*x + c)^4 - 630*I*tan(d
*x + c)^2 + 420*tan(d*x + c))/(a^3*d)
```

mupad [B] time = 3.60, size = 119, normalized size = 1.09

$$\frac{\cos\left(c+d\,x\right)^{10}84\mathrm{i}+128\,\sin\left(c+d\,x\right)\,\cos\left(c+d\,x\right)^{9}+64\,\sin\left(c+d\,x\right)\,\cos\left(c+d\,x\right)^{7}+48\,\sin\left(c+d\,x\right)\,\cos\left(c+d\cdots\right.}{210\,a^3\,d\cos\left(c+d\,x\right)^{\cdots}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^14*(a + a*tan(c + d*x)*1i)^3),x)
```

```
[Out] (40*cos(c + d*x)^3*sin(c + d*x) - 70*cos(c + d*x)*sin(c + d*x) + 48*cos(c +
 d*x)^5*sin(c + d*x) + 64*cos(c + d*x)^7*sin(c + d*x) + 128*cos(c + d*x)^9*
sin(c + d*x) - cos(c + d*x)^2*105i + cos(c + d*x)^10*84i + 21i)/(210*a^3*d*
cos(c + d*x)^10)
```

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

$$\frac{i\int\frac{\sec^{14}(c+dx)}{\tan^3(c+dx)-3i\tan^2(c+dx)-3\tan(c+dx)+i}\,dx}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**14/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] I*Integral(sec(c + d*x)**14/(tan(c + d*x)**3 - 3*I*tan(c + d*x)**2 - 3*tan(
c + d*x) + I), x)/a**3
```

3.131 $\int \frac{\sec^{12}(c+dx)}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=82

$$\frac{i(a-ia\tan(c+dx))^8}{8a^{11}d}-\frac{4i(a-ia\tan(c+dx))^7}{7a^{10}d}+\frac{2i(a-ia\tan(c+dx))^6}{3a^9d}$$

```
[Out] 2/3*I*(a-I*a*tan(d*x+c))^6/a^9/d-4/7*I*(a-I*a*tan(d*x+c))^7/a^10/d+1/8*I*(a
-I*a*tan(d*x+c))^8/a^11/d
```

Rubi [A] time = 0.06, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{i(a-ia\tan(c+dx))^8}{8a^{11}d}-\frac{4i(a-ia\tan(c+dx))^7}{7a^{10}d}+\frac{2i(a-ia\tan(c+dx))^6}{3a^9d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^12/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (((2*I)/3)*(a - I*a*Tan[c + d*x])^6)/(a^9*d) - (((4*I)/7)*(a - I*a*Tan[c +
d*x])^7)/(a^10*d) + ((I/8)*(a - I*a*Tan[c + d*x])^8)/(a^11*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^{12}(c+dx)}{(a+ia\tan(c+dx))^3}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^5(a+x)^2\,dx, x, ia\tan(c+dx)\right)}{a^{11}d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(4a^2(a-x)^5-4a(a-x)^6+(a-x)^7\right)dx, x, ia\tan(c+dx)\right)}{a^{11}d}\\ &= \frac{2i(a-ia\tan(c+dx))^6}{3a^9d}-\frac{4i(a-ia\tan(c+dx))^7}{7a^{10}d}+\frac{i(a-ia\tan(c+dx))^8}{8a^{11}d}\end{aligned}$$

Mathematica [A] time = 0.66, size = 106, normalized size = 1.29

$$\frac{\sec(c)\sec^8(c+dx)(28\sin(c+2dx)-28\sin(3c+2dx)+28\sin(3c+4dx)+8\sin(5c+6dx)+\sin(7c+8dx)-28}{168a^3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^12/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (Sec[c]*Sec[c + d*x]^8*((-35*I)*Cos[c] - (28*I)*Cos[c + 2*d*x] - (28*I)*Cos
[3*c + 2*d*x] - 35*Sin[c] + 28*Sin[c + 2*d*x] - 28*Sin[3*c + 2*d*x] + 28*Si
n[3*c + 4*d*x] + 8*Sin[5*c + 6*d*x] + Sin[7*c + 8*d*x]))/(168*a^3*d)
```

fricas [B] time = 0.58, size = 153, normalized size = 1.87

$$\frac{896i\,e^{(4i\,dx+4i\,c)} + 256i\,e^{(2i\,dx+2i\,c)} + 32i}{21\left(a^3de^{(16i\,dx+16i\,c)} + 8\,a^3de^{(14i\,dx+14i\,c)} + 28\,a^3de^{(12i\,dx+12i\,c)} + 56\,a^3de^{(10i\,dx+10i\,c)} + 70\,a^3de^{(8i\,dx+8i\,c)} + 56\,a^3de^{(6i\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^12/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/21*(896*I*e^(4*I*d*x + 4*I*c) + 256*I*e^(2*I*d*x + 2*I*c) + 32*I)/(a^3*d*
e^(16*I*d*x + 16*I*c) + 8*a^3*d*e^(14*I*d*x + 14*I*c) + 28*a^3*d*e^(12*I*d*
x + 12*I*c) + 56*a^3*d*e^(10*I*d*x + 10*I*c) + 70*a^3*d*e^(8*I*d*x + 8*I*c)
 + 56*a^3*d*e^(6*I*d*x + 6*I*c) + 28*a^3*d*e^(4*I*d*x + 4*I*c) + 8*a^3*d*e^
(2*I*d*x + 2*I*c) + a^3*d)
```

giac [A] time = 1.72, size = 87, normalized size = 1.06

$$-\frac{-21i\,\tan\left(dx+c\right)^{8} + 72\,\tan\left(dx+c\right)^{7} + 28i\,\tan\left(dx+c\right)^{6} + 168\,\tan\left(dx+c\right)^{5} + 210i\,\tan\left(dx+c\right)^{4} + 56\,\tan}{168\,a^{3}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^12/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -1/168*(-21*I*tan(d*x + c)^8 + 72*tan(d*x + c)^7 + 28*I*tan(d*x + c)^6 + 16
8*tan(d*x + c)^5 + 210*I*tan(d*x + c)^4 + 56*tan(d*x + c)^3 + 252*I*tan(d*x
 + c)^2 - 168*tan(d*x + c))/(a^3*d)
```

maple [A] time = 0.39, size = 89, normalized size = 1.09

$$\frac{\tan\left(dx+c\right) + \frac{i\left(\tan^{8}(dx+c)\right)}{8} - \frac{3\left(\tan^{7}(dx+c)\right)}{7} - \frac{i\left(\tan^{6}(dx+c)\right)}{6} - \left(\tan^{5}\left(dx+c\right)\right) - \frac{5i\left(\tan^{4}(dx+c)\right)}{4} - \frac{\left(\tan^{3}(dx+c)\right)}{3} - \frac{3i\left(\tan^{2}(dx+\right.}{2}}{d\,a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^12/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 1/d/a^3*(tan(d*x+c)+1/8*I*tan(d*x+c)^8-3/7*tan(d*x+c)^7-1/6*I*tan(d*x+c)^6-
tan(d*x+c)^5-5/4*I*tan(d*x+c)^4-1/3*tan(d*x+c)^3-3/2*I*tan(d*x+c)^2)
```

maxima [A] time = 0.44, size = 87, normalized size = 1.06

$$-\frac{-21i\,\tan\left(dx+c\right)^{8} + 72\,\tan\left(dx+c\right)^{7} + 28i\,\tan\left(dx+c\right)^{6} + 168\,\tan\left(dx+c\right)^{5} + 210i\,\tan\left(dx+c\right)^{4} + 56\,\tan}{168\,a^{3}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^12/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/168*(-21*I*tan(d*x + c)^8 + 72*tan(d*x + c)^7 + 28*I*tan(d*x + c)^6 + 16
8*tan(d*x + c)^5 + 210*I*tan(d*x + c)^4 + 56*tan(d*x + c)^3 + 252*I*tan(d*x
 + c)^2 - 168*tan(d*x + c))/(a^3*d)
```

mupad [B] time = 3.49, size = 103, normalized size = 1.26

$$\frac{\cos\left(c+d\,x\right)^{8}\,91\mathrm{i} + 128\,\sin\left(c+d\,x\right)\,\cos\left(c+d\,x\right)^{7} + 64\,\sin\left(c+d\,x\right)\,\cos\left(c+d\,x\right)^{5} + 48\,\sin\left(c+d\,x\right)\,\cos\left(c+\right.}{168\,a^{3}\,d\,\cos\left(c+d\,x\right)^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^12*(a + a*tan(c + d*x)*1i)^3),x)
```

```
[Out] (48*cos(c + d*x)^3*sin(c + d*x) - 72*cos(c + d*x)*sin(c + d*x) + 64*cos(c +
 d*x)^5*sin(c + d*x) + 128*cos(c + d*x)^7*sin(c + d*x) - cos(c + d*x)^2*112
i + cos(c + d*x)^8*91i + 21i)/(168*a^3*d*cos(c + d*x)^8)
```

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

$$\frac{i\int\frac{\sec^{12}(c+dx)}{\tan^3(c+dx)-3i\tan^2(c+dx)-3\tan(c+dx)+i}\,dx}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**12/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] I*Integral(sec(c + d*x)**12/(tan(c + d*x)**3 - 3*I*tan(c + d*x)**2 - 3*tan(
c + d*x) + I), x)/a**3
```

3.132 $\int \frac{\sec^{10}(c+dx)}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=55

$$\frac{2i(a-ia\tan(c+dx))^5}{5a^8d}-\frac{i(a-ia\tan(c+dx))^6}{6a^9d}$$

```
[Out] 2/5*I*(a-I*a*tan(d*x+c))^5/a^8/d-1/6*I*(a-I*a*tan(d*x+c))^6/a^9/d
```

Rubi [A] time = 0.05, antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{2i(a-ia\tan(c+dx))^5}{5a^8d}-\frac{i(a-ia\tan(c+dx))^6}{6a^9d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^10/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (((2*I)/5)*(a - I*a*Tan[c + d*x])^5)/(a^8*d) - ((I/6)*(a - I*a*Tan[c + d*x]
)^6)/(a^9*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^{10}(c+dx)}{(a+ia\tan(c+dx))^3}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^4(a+x)\,dx,x,ia\tan(c+dx)\right)}{a^9d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(2a(a-x)^4-(a-x)^5\right)\,dx,x,ia\tan(c+dx)\right)}{a^9d}\\ &= \frac{2i(a-ia\tan(c+dx))^5}{5a^8d}-\frac{i(a-ia\tan(c+dx))^6}{6a^9d}\end{aligned}$$

Mathematica [A] time = 0.60, size = 97, normalized size = 1.76

$$\frac{\sec(c)\sec^6(c+dx)(15\sin(c+2dx)-15\sin(3c+2dx)+12\sin(3c+4dx)+2\sin(5c+6dx)-15i\cos(c+2dx)}{60a^3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^10/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (Sec[c]*Sec[c + d*x]^6*((-20*I)*Cos[c] - (15*I)*Cos[c + 2*d*x] - (15*I)*Cos
[3*c + 2*d*x] - 20*Sin[c] + 15*Sin[c + 2*d*x] - 15*Sin[3*c + 2*d*x] + 12*Si
n[3*c + 4*d*x] + 2*Sin[5*c + 6*d*x]))/(60*a^3*d)
```

fricas [B] time = 0.60, size = 112, normalized size = 2.04

$$\frac{192i\,e^{(2i\,dx+2i\,c)}+32i}{15\left(a^3de^{(12i\,dx+12i\,c)}+6\,a^3de^{(10i\,dx+10i\,c)}+15\,a^3de^{(8i\,dx+8i\,c)}+20\,a^3de^{(6i\,dx+6i\,c)}+15\,a^3de^{(4i\,dx+4i\,c)}+6\,a^3de^{(2i\,dx+2i\,c)}+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/15*(192*I*e^(2*I*d*x + 2*I*c) + 32*I)/(a^3*d*e^(12*I*d*x + 12*I*c) + 6*a^
3*d*e^(10*I*d*x + 10*I*c) + 15*a^3*d*e^(8*I*d*x + 8*I*c) + 20*a^3*d*e^(6*I*
d*x + 6*I*c) + 15*a^3*d*e^(4*I*d*x + 4*I*c) + 6*a^3*d*e^(2*I*d*x + 2*I*c) +
 a^3*d)
```

giac [A] time = 1.72, size = 67, normalized size = 1.22

$$-\frac{-5i\,\tan\left(dx+c\right)^6+18\,\tan\left(dx+c\right)^5+15i\,\tan\left(dx+c\right)^4+20\,\tan\left(dx+c\right)^3+45i\,\tan\left(dx+c\right)^2-30\,\tan\left(dx+c\right.}{30\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -1/30*(-5*I*tan(d*x + c)^6 + 18*tan(d*x + c)^5 + 15*I*tan(d*x + c)^4 + 20*t
an(d*x + c)^3 + 45*I*tan(d*x + c)^2 - 30*tan(d*x + c))/(a^3*d)
```

maple [A] time = 0.38, size = 68, normalized size = 1.24

$$\frac{\tan\left(dx+c\right)+\frac{i\left(\tan^6\left(dx+c\right)\right)}{6}-\frac{3\left(\tan^5\left(dx+c\right)\right)}{5}-\frac{i\left(\tan^4\left(dx+c\right)\right)}{2}-\frac{2\left(\tan^3\left(dx+c\right)\right)}{3}-\frac{3i\left(\tan^2\left(dx+c\right)\right)}{2}}{d\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 1/d/a^3*(tan(d*x+c)+1/6*I*tan(d*x+c)^6-3/5*tan(d*x+c)^5-1/2*I*tan(d*x+c)^4-
2/3*tan(d*x+c)^3-3/2*I*tan(d*x+c)^2)
```

maxima [A] time = 0.32, size = 67, normalized size = 1.22

$$\frac{5i\,\tan\left(dx+c\right)^6-18\,\tan\left(dx+c\right)^5-15i\,\tan\left(dx+c\right)^4-20\,\tan\left(dx+c\right)^3-45i\,\tan\left(dx+c\right)^2+30\,\tan\left(dx+c\right)}{30\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/30*(5*I*tan(d*x + c)^6 - 18*tan(d*x + c)^5 - 15*I*tan(d*x + c)^4 - 20*tan
(d*x + c)^3 - 45*I*tan(d*x + c)^2 + 30*tan(d*x + c))/(a^3*d)
```

mupad [B] time = 3.34, size = 114, normalized size = 2.07

$$-\frac{\sin\left(c+d\,x\right)\,\left(-30\cos\left(c+d\,x\right)^5+\cos\left(c+d\,x\right)^4\,\sin\left(c+d\,x\right)\,45\mathrm{i}+20\cos\left(c+d\,x\right)^3\sin\left(c+d\,x\right)^2+\cos\left(c+d\,x\right.\right.}{30\,a^3\,d\cos\left(c+d\,x\right)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^10*(a + a*tan(c + d*x)*1i)^3),x)
```

```
[Out] -(sin(c + d*x)*(18*cos(c + d*x)*sin(c + d*x)^4 + cos(c + d*x)^4*sin(c + d*x
)*45i - 30*cos(c + d*x)^5 - sin(c + d*x)^5*5i + cos(c + d*x)^2*sin(c + d*x)
^3*15i + 20*cos(c + d*x)^3*sin(c + d*x)^2))/(30*a^3*d*cos(c + d*x)^6)
```

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

$$\frac{i\int\frac{\sec^{10}(c+dx)}{\tan^3(c+dx)-3i\tan^2(c+dx)-3\tan(c+dx)+i}\,dx}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**10/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] I*Integral(sec(c + d*x)**10/(tan(c + d*x)**3 - 3*I*tan(c + d*x)**2 - 3*tan(
c + d*x) + I), x)/a**3
```

3.133 $\int \frac{\sec^8(c+dx)}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=27

$$\frac{i(a-ia\tan(c+dx))^4}{4a^7d}$$

```
[Out] 1/4*I*(a-I*a*tan(d*x+c))^4/a^7/d
```

Rubi [A] time = 0.04, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 32}

$$\frac{i(a-ia\tan(c+dx))^4}{4a^7d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^8/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] ((I/4)*(a - I*a*Tan[c + d*x])^4)/(a^7*d)
```

Rule 32

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && 
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^8(c+dx)}{(a+ia\tan(c+dx))^3}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^3\,dx, x, ia\tan(c+dx)\right)}{a^7d}\\ &= \frac{i(a-ia\tan(c+dx))^4}{4a^7d}\end{aligned}$$

Mathematica [B] time = 0.47, size = 84, normalized size = 3.11

$$\frac{\sec(c)\sec^4(c+dx)(2\sin(c+2dx)-2\sin(3c+2dx)+\sin(3c+4dx)-2i\cos(c+2dx)-2i\cos(3c+2dx)-3\sin(}{4a^3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^8/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (Sec[c]*Sec[c + d*x]^4*((-3*I)*Cos[c] - (2*I)*Cos[c + 2*d*x] - (2*I)*Cos[3*
c + 2*d*x] - 3*Sin[c] + 2*Sin[c + 2*d*x] - 2*Sin[3*c + 2*d*x] + Sin[3*c + 4
*d*x]))/(4*a^3*d)
```

fricas [B] time = 0.58, size = 69, normalized size = 2.56

$$\frac{4i}{a^3de^{(8i\,dx+8i\,c)}+4\,a^3de^{(6i\,dx+6i\,c)}+6\,a^3de^{(4i\,dx+4i\,c)}+4\,a^3de^{(2i\,dx+2i\,c)}+a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 4*I/(a^3*d*e^(8*I*d*x + 8*I*c) + 4*a^3*d*e^(6*I*d*x + 6*I*c) + 6*a^3*d*e^(4
*I*d*x + 4*I*c) + 4*a^3*d*e^(2*I*d*x + 2*I*c) + a^3*d)
```

giac [B] time = 1.43, size = 47, normalized size = 1.74

$$-\frac{-i\tan(dx+c)^{4}+4\tan(dx+c)^{3}+6i\tan(dx+c)^{2}-4\tan(dx+c)}{4a^{3}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -1/4*(-I*tan(d*x + c)^4 + 4*tan(d*x + c)^3 + 6*I*tan(d*x + c)^2 - 4*tan(d*x
 + c))/(a^3*d)
```

maple [A] time = 0.39, size = 47, normalized size = 1.74

$$\frac{\tan(dx+c)+\frac{i\left(\tan^{4}(dx+c)\right)}{4}-\left(\tan^{3}(dx+c)\right)-\frac{3i\left(\tan^{2}(dx+c)\right)}{2}}{d\,a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 1/d/a^3*(tan(d*x+c)+1/4*I*tan(d*x+c)^4-tan(d*x+c)^3-3/2*I*tan(d*x+c)^2)
```

maxima [B] time = 0.36, size = 47, normalized size = 1.74

$$-\frac{-i\tan(dx+c)^{4}+4\tan(dx+c)^{3}+6i\tan(dx+c)^{2}-4\tan(dx+c)}{4a^{3}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/4*(-I*tan(d*x + c)^4 + 4*tan(d*x + c)^3 + 6*I*tan(d*x + c)^2 - 4*tan(d*x
 + c))/(a^3*d)
```

mupad [B] time = 3.34, size = 77, normalized size = 2.85

$$-\frac{\sin(c+d\,x)\,(-4\cos(c+d\,x)^{3}+\cos(c+d\,x)^{2}\,\sin(c+d\,x)\,6\mathrm{i}+4\,\cos(c+d\,x)\,\sin(c+d\,x)^{2}-\sin(c+d\,x)^{3}}{4\,a^{3}\,d\cos(c+d\,x)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^8*(a + a*tan(c + d*x)*1i)^3),x)
```

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

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

$$\frac{i\int\frac{\sec^{8}(c+dx)}{\tan^{3}(c+dx)-3i\tan^{2}(c+dx)-3\tan(c+dx)+i}\,dx}{a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] I*Integral(sec(c + d*x)**8/(tan(c + d*x)**3 - 3*I*tan(c + d*x)**2 - 3*tan(c
 + d*x) + I), x)/a**3
```

3.134 $\int \frac{\sec^6(c+dx)}{(a+ia\tan(c+dx))^3} dx$

Optimal. Leaf size=58

$$\frac{i\tan^2(c+dx)}{2a^3d} - \frac{3\tan(c+dx)}{a^3d} + \frac{4i\log(\cos(c+dx))}{a^3d} + \frac{4x}{a^3}$$

```
[Out] 4*x/a^3+4*I*ln(cos(d*x+c))/a^3/d-3*tan(d*x+c)/a^3/d+1/2*I*tan(d*x+c)^2/a^3/
d
```

Rubi [A] time = 0.05, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = $\{3487, 43\}$

$$\frac{i\tan^2(c+dx)}{2a^3d} - \frac{3\tan(c+dx)}{a^3d} + \frac{4i\log(\cos(c+dx))}{a^3d} + \frac{4x}{a^3}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (4*x)/a^3 + ((4*I)*Log[Cos[c + d*x]])/(a^3*d) - (3*Tan[c + d*x])/(a^3*d) +
((I/2)*Tan[c + d*x]^2)/(a^3*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sec^6(c+dx)}{(a+ia\tan(c+dx))^3} dx &= -\frac{i\operatorname{Subst}\left(\int \frac{(a-x)^2}{a+x} dx, x, ia\tan(c+dx)\right)}{a^5d} \\
&= -\frac{i\operatorname{Subst}\left(\int \left(-3a+x+\frac{4a^2}{a+x}\right) dx, x, ia\tan(c+dx)\right)}{a^5d} \\
&= \frac{4x}{a^3} + \frac{4i\log(\cos(c+dx))}{a^3d} - \frac{3\tan(c+dx)}{a^3d} + \frac{i\tan^2(c+dx)}{2a^3d}
\end{aligned}$$

Mathematica [A] time = 0.47, size = 113, normalized size = 1.95

$$\frac{\sec(c)\sec^2(c+dx)(-3\sin(c+2dx)+2dx\cos(3c+2dx)+2i\cos(3c+2dx)\log(\cos(c+dx))+2\cos(c+2dx)(dx}{2a^3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (Sec[c]*Sec[c + d*x]^2*(2*d*x*Cos[3*c + 2*d*x] + 2*Cos[c + 2*d*x]*(d*x + I*
Log[Cos[c + d*x]]) + Cos[c]*(I + 4*d*x + (4*I)*Log[Cos[c + d*x]]) + (2*I)*C
os[3*c + 2*d*x]*Log[Cos[c + d*x]] + 3*Sin[c] - 3*Sin[c + 2*d*x]))/(2*a^3*d)
```

fricas [B] time = 0.73, size = 110, normalized size = 1.90

$$\frac{8\,dxe^{(4i\,dx+4i\,c)}+8\,dx+(16\,dx-4i)e^{(2i\,dx+2i\,c)}+\left(4i\,e^{(4i\,dx+4i\,c)}+8i\,e^{(2i\,dx+2i\,c)}+4i\right)\log\left(e^{(2i\,dx+2i\,c)}+1\right)-6i}{a^3de^{(4i\,dx+4i\,c)}+2\,a^3de^{(2i\,dx+2i\,c)}+a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] (8*d*x*e^(4*I*d*x + 4*I*c) + 8*d*x + (16*d*x - 4*I)*e^(2*I*d*x + 2*I*c) + (
4*I*e^(4*I*d*x + 4*I*c) + 8*I*e^(2*I*d*x + 2*I*c) + 4*I)*log(e^(2*I*d*x + 2
*I*c) + 1) - 6*I)/(a^3*d*e^(4*I*d*x + 4*I*c) + 2*a^3*d*e^(2*I*d*x + 2*I*c)
+ a^3*d)
```

giac [B] time = 1.03, size = 128, normalized size = 2.21

$$\frac{2\left(\frac{2i\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^3}-\frac{4i\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)}{a^3}+\frac{2i\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)}{a^3}+\frac{-3i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^4+3\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+7i\,\tan\left(\frac{1}{2}\,dx\cdots\right.}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)^2a^3}\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 2*(2*I*log(tan(1/2*d*x + 1/2*c) + 1)/a^3 - 4*I*log(tan(1/2*d*x + 1/2*c) - I
)/a^3 + 2*I*log(tan(1/2*d*x + 1/2*c) - 1)/a^3 + (-3*I*tan(1/2*d*x + 1/2*c)^
4 + 3*tan(1/2*d*x + 1/2*c)^3 + 7*I*tan(1/2*d*x + 1/2*c)^2 - 3*tan(1/2*d*x +
 1/2*c) - 3*I)/((tan(1/2*d*x + 1/2*c)^2 - 1)^2*a^3))/d
```

maple [A] time = 0.38, size = 52, normalized size = 0.90

$$-\frac{3\tan(dx+c)}{a^3d}+\frac{i\left(\tan^2(dx+c)\right)}{2a^3d}-\frac{4i\ln(\tan(dx+c)-i)}{a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^3,x)
```

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

maxima [A] time = 0.41, size = 45, normalized size = 0.78

$$\frac{\frac{i\,\tan(dx+c)^2-6\,\tan(dx+c)}{a^3}-\frac{8i\,\log(i\,\tan(dx+c)+1)}{a^3}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/2*((I*tan(d*x + c)^2 - 6*tan(d*x + c))/a^3 - 8*I*log(I*tan(d*x + c) + 1)/
a^3)/d
```

mupad [B] time = 3.37, size = 41, normalized size = 0.71

$$-\frac{\ln(\tan(c+d\,x)-\mathrm{i})\,8\mathrm{i}+6\tan(c+d\,x)-\tan(c+d\,x)^2\,1\mathrm{i}}{2\,a^3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^3),x)
```

```
[Out] -(log(tan(c + d*x) - 1i)*8i + 6*tan(c + d*x) - tan(c + d*x)^2*1i)/(2*a^3*d)
```

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

$$\frac{i \int \frac{\sec^6(c+dx)}{\tan^3(c+dx)-3i\tan^2(c+dx)-3\tan(c+dx)+i}\,dx}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] I*Integral(sec(c + d*x)**6/(tan(c + d*x)**3 - 3*I*tan(c + d*x)**2 - 3*tan(c
 + d*x) + I), x)/a**3
```

3.135 $\int \frac{\sec^4(c+dx)}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=50

$$\frac{2i}{d\left(a^3+ia^3\tan(c+dx)\right)}-\frac{i\log(\cos(c+dx))}{a^3d}-\frac{x}{a^3}$$

```
[Out] -x/a^3-I*ln(cos(d*x+c))/a^3/d+2*I/d/(a^3+I*a^3*tan(d*x+c))
```

Rubi [A] time = 0.05, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{2i}{d\left(a^3+ia^3\tan(c+dx)\right)}-\frac{i\log(\cos(c+dx))}{a^3d}-\frac{x}{a^3}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] -(x/a^3) - (I*Log[Cos[c + d*x]])/(a^3*d) + (2*I)/(d*(a^3 + I*a^3*Tan[c + d*
x]))
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^4(c+dx)}{(a+ia\tan(c+dx))^3}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{a-x}{(a+x)^2}\,dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(\frac{1}{-a-x}+\frac{2a}{(a+x)^2}\right)dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{x}{a^3}-\frac{i\log(\cos(c+dx))}{a^3d}+\frac{2i}{d\left(a^3+ia^3\tan(c+dx)\right)}\end{aligned}$$

Mathematica [A] time = 0.25, size = 88, normalized size = 1.76

$$\frac{\sec^2(c+dx)(\cos(2(c+dx))+i\sin(2(c+dx)))(\log(\cos(c+dx))+\tan(c+dx)(i\log(\cos(c+dx))+dx+i)-i}{a^3d(\tan(c+dx)-i)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (Sec[c + d*x]^2*(Cos[2*(c + d*x)] + I*Sin[2*(c + d*x)])*(-1 - I*d*x + Log[C
os[c + d*x]] + (I + d*x + I*Log[Cos[c + d*x]])*Tan[c + d*x]))/(a^3*d*(-I +
Tan[c + d*x])^3)
```

fricas [A] time = 0.52, size = 55, normalized size = 1.10

$$-\frac{\left(2\,dxe^{(2i\,dx+2i\,c)}+i\,e^{(2i\,dx+2i\,c)}\log\left(e^{(2i\,dx+2i\,c)}+1\right)-i\right)e^{(-2i\,dx-2i\,c)}}{a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

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

giac [B] time = 1.45, size = 100, normalized size = 2.00

$$-\frac{\frac{i\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^3}-\frac{2i\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)}{a^3}+\frac{i\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)}{a^3}+\frac{3i\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+10\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-3i}{a^3\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)^2}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -(I*log(tan(1/2*d*x + 1/2*c) + 1)/a^3 - 2*I*log(tan(1/2*d*x + 1/2*c) - I)/a
^3 + I*log(tan(1/2*d*x + 1/2*c) - 1)/a^3 + (3*I*tan(1/2*d*x + 1/2*c)^2 + 10
*tan(1/2*d*x + 1/2*c) - 3*I)/(a^3*(tan(1/2*d*x + 1/2*c) - I)^2))/d
```

maple [A] time = 0.43, size = 40, normalized size = 0.80

$$\frac{2}{a^3d\left(\tan\left(dx+c\right)-i\right)}+\frac{i\ln\left(\tan\left(dx+c\right)-i\right)}{a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 2/a^3/d/(tan(d*x+c)-I)+I/a^3/d*ln(tan(d*x+c)-I)
```

maxima [A] time = 0.60, size = 66, normalized size = 1.32

$$-\frac{\frac{4\left(-i\tan(dx+c)-1\right)}{2i\,a^3\tan(dx+c)^2+4\,a^3\tan(dx+c)-2i\,a^3}-\frac{i\log(i\tan(dx+c)+1)}{a^3}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -(4*(-I*tan(d*x + c) - 1)/(2*I*a^3*tan(d*x + c)^2 + 4*a^3*tan(d*x + c) - 2*
I*a^3) - I*log(I*tan(d*x + c) + 1)/a^3)/d
```

mupad [B] time = 3.41, size = 42, normalized size = 0.84

$$\frac{\ln\left(\tan\left(c+d\,x\right)-\mathrm{i}\right)\,1\mathrm{i}}{a^3\,d}+\frac{2\mathrm{i}}{a^3\,d\,\left(1+\tan\left(c+d\,x\right)\,1\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^3),x)
```

```
[Out] (log(tan(c + d*x) - 1i)*1i)/(a^3*d) + 2i/(a^3*d*(tan(c + d*x)*1i + 1))
```

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

$$\frac{i\int\frac{\sec^4(c+dx)}{\tan^3(c+dx)-3i\tan^2(c+dx)-3\tan(c+dx)+i}\,dx}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] I*Integral(sec(c + d*x)**4/(tan(c + d*x)**3 - 3*I*tan(c + d*x)**2 - 3*tan(c
 + d*x) + I), x)/a**3
```

3.136 $\int \frac{\sec^2(c+dx)}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=27

$$\frac{i}{2ad(a+ia\tan(c+dx))^2}$$

```
[Out] 1/2*I/a/d/(a+I*a*tan(d*x+c))^2
```

Rubi [A] time = 0.05, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = $\{3487, 32\}$

$$\frac{i}{2ad(a+ia\tan(c+dx))^2}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (I/2)/(a*d*(a + I*a*Tan[c + d*x])^2)
```

Rule 32

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^2(c+dx)}{(a+ia\tan(c+dx))^3}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{1}{(a+x)^3}\,dx, x, ia\tan(c+dx)\right)}{ad}\\ &= \frac{i}{2ad(a+ia\tan(c+dx))^2}\end{aligned}$$

Mathematica [A] time = 0.10, size = 42, normalized size = 1.56

$$-\frac{i(\tan(c+dx)-3i)\sec^2(c+dx)}{8a^3d(\tan(c+dx)-i)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] ((-1/8*I)*Sec[c + d*x]^2*(-3*I + Tan[c + d*x]))/(a^3*d*(-I + Tan[c + d*x])^3)
```

fricas [A] time = 0.58, size = 30, normalized size = 1.11

$$\frac{\left(2i\,e^{(2i\,dx+2i\,c)}+i\right)e^{(-4i\,dx-4i\,c)}}{8\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/8*(2*I*e^(2*I*d*x + 2*I*c) + I)*e^(-4*I*d*x - 4*I*c)/(a^3*d)
```

giac [B] time = 1.55, size = 57, normalized size = 2.11

$$-\frac{2\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{3}-i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{2}-\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}{a^{3}d\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -2*(tan(1/2*d*x + 1/2*c)^3 - I*tan(1/2*d*x + 1/2*c)^2 - tan(1/2*d*x + 1/2*c
))/(a^3*d*(tan(1/2*d*x + 1/2*c) - I)^4)
```

maple [A] time = 0.26, size = 24, normalized size = 0.89

$$\frac{i}{2ad\left(a+ia\tan\left(dx+c\right)\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 1/2*I/a/d/(a+I*a*tan(d*x+c))^2
```

maxima [A] time = 0.35, size = 21, normalized size = 0.78

$$\frac{i}{2\left(i\,a\tan\left(dx+c\right)+a\right)^{2}ad}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/2*I/((I*a*tan(d*x + c) + a)^2*a*d)
```

mupad [B] time = 3.35, size = 20, normalized size = 0.74

$$-\frac{1\mathrm{i}}{2\,a^{3}\,d\,\left(\tan\left(c+d\,x\right)-\mathrm{i}\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^3),x)
```

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

sympy [A] time = 2.12, size = 153, normalized size = 5.67

$$\begin{cases} -\frac{i\tan\left(c+dx\right)\sec^{2}\left(c+dx\right)}{8a^{3}d\tan^{3}\left(c+dx\right)-24ia^{3}d\tan^{2}\left(c+dx\right)-24a^{3}d\tan\left(c+dx\right)+8ia^{3}d}-\frac{3\sec^{2}\left(c+dx\right)}{8a^{3}d\tan^{3}\left(c+dx\right)-24ia^{3}d\tan^{2}\left(c+dx\right)-24a^{3}d\tan\left(c+dx\right)+8ia^{3}d} & \text{for}\ d\neq \\ \frac{x\sec^{2}\left(c\right)}{\left(ia\tan\left(c\right)+a\right)^{3}} & \text{otherw} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] Piecewise((-I*tan(c + d*x)*sec(c + d*x)**2/(8*a**3*d*tan(c + d*x)**3 - 24*I
*a**3*d*tan(c + d*x)**2 - 24*a**3*d*tan(c + d*x) + 8*I*a**3*d) - 3*sec(c +
d*x)**2/(8*a**3*d*tan(c + d*x)**3 - 24*I*a**3*d*tan(c + d*x)**2 - 24*a**3*d
*tan(c + d*x) + 8*I*a**3*d), Ne(d, 0)), (x*sec(c)**2/(I*a*tan(c) + a)**3, T
rue))
```

3.137 $\int \frac{1}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=88

$$\frac{i}{8d\left(a^3+ia^3\tan(c+dx)\right)}+\frac{x}{8a^3}+\frac{i}{8ad(a+ia\tan(c+dx))^2}+\frac{i}{6d(a+ia\tan(c+dx))^3}$$

```
[Out] 1/8*x/a^3+1/6*I/d/(a+I*a*tan(d*x+c))^3+1/8*I/a/d/(a+I*a*tan(d*x+c))^2+1/8*I
/d/(a^3+I*a^3*tan(d*x+c))
```

Rubi [A] time = 0.05, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {3479, 8}

$$\frac{i}{8d\left(a^3+ia^3\tan(c+dx)\right)}+\frac{x}{8a^3}+\frac{i}{8ad(a+ia\tan(c+dx))^2}+\frac{i}{6d(a+ia\tan(c+dx))^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^(-3),x]
```

```
[Out] x/(8*a^3) + (I/6)/(d*(a + I*a*Tan[c + d*x])^3) + (I/8)/(a*d*(a + I*a*Tan[c
+ d*x])^2) + (I/8)/(d*(a^3 + I*a^3*Tan[c + d*x]))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 3479

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

Rubi steps

$$\begin{aligned}
\int \frac{1}{(a+ia\tan(c+dx))^3}\,dx &= \frac{i}{6d(a+ia\tan(c+dx))^3}+\frac{\int \frac{1}{(a+ia\tan(c+dx))^2}\,dx}{2a}\\
&= \frac{i}{6d(a+ia\tan(c+dx))^3}+\frac{i}{8ad(a+ia\tan(c+dx))^2}+\frac{\int \frac{1}{a+ia\tan(c+dx)}\,dx}{4a^2}\\
&= \frac{i}{6d(a+ia\tan(c+dx))^3}+\frac{i}{8ad(a+ia\tan(c+dx))^2}+\frac{i}{8d\left(a^3+ia^3\tan(c+dx)\right)}+\\
&= \frac{x}{8a^3}+\frac{i}{6d(a+ia\tan(c+dx))^3}+\frac{i}{8ad(a+ia\tan(c+dx))^2}+\frac{i}{8d\left(a^3+ia^3\tan(c+\right.}
\end{aligned}$$

Mathematica [A] time = 0.25, size = 93, normalized size = 1.06

$$\frac{i\sec^3(c+dx)(-9\sin(c+dx)+12idx\sin(3(c+dx))+2\sin(3(c+dx))+27i\cos(c+dx)+2(6dx+i)\cos(3(c}{96a^3d(\tan(c+dx)-i)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^(-3),x]
```

```
[Out] ((I/96)*Sec[c + d*x]^3*((27*I)*Cos[c + d*x] + 2*(I + 6*d*x)*Cos[3*(c + d*x)
] - 9*Sin[c + d*x] + 2*Sin[3*(c + d*x)] + (12*I)*d*x*Sin[3*(c + d*x)]))/(a^
3*d*(-I + Tan[c + d*x])^3)
```

fricas [A] time = 0.43, size = 54, normalized size = 0.61

$$\frac{\left(12\,dxe^{(6i\,dx+6i\,c)}+18i\,e^{(4i\,dx+4i\,c)}+9i\,e^{(2i\,dx+2i\,c)}+2i\right)e^{(-6i\,dx-6i\,c)}}{96\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/96*(12*d*x*e^(6*I*d*x + 6*I*c) + 18*I*e^(4*I*d*x + 4*I*c) + 9*I*e^(2*I*d*
x + 2*I*c) + 2*I)*e^(-6*I*d*x - 6*I*c)/(a^3*d)
```

giac [A] time = 0.66, size = 80, normalized size = 0.91

$$-\frac{\frac{6i\,\log(\tan(dx+c)-i)}{a^3}-\frac{6i\,\log(i\,\tan(dx+c)-1)}{a^3}+\frac{-11i\,\tan(dx+c)^3-45\,\tan(dx+c)^2+69i\,\tan(dx+c)+51}{a^3(\tan(dx+c)-i)^3}}{96\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -1/96*(6*I*log(tan(d*x + c) - I)/a^3 - 6*I*log(I*tan(d*x + c) - 1)/a^3 + (-
11*I*tan(d*x + c)^3 - 45*tan(d*x + c)^2 + 69*I*tan(d*x + c) + 51)/(a^3*(tan
(d*x + c) - I)^3))/d
```

maple [A] time = 0.11, size = 98, normalized size = 1.11

$$\frac{i\ln(\tan(dx+c)+i)}{16d\,a^3}-\frac{i\ln(\tan(dx+c)-i)}{16a^3d}-\frac{i}{8d\,a^3(\tan(dx+c)-i)^2}-\frac{1}{6d\,a^3(\tan(dx+c)-i)^3}+\frac{1}{8a^3d(\tan(dx+c$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 1/16*I/d/a^3*ln(tan(d*x+c)+I)-1/16*I/a^3/d*ln(tan(d*x+c)-I)-1/8*I/d/a^3/(ta
n(d*x+c)-I)^2-1/6/d/a^3/(tan(d*x+c)-I)^3+1/8/a^3/d/(tan(d*x+c)-I)
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 3.49, size = 50, normalized size = 0.57

$$\frac{x}{8\,a^3}-\frac{\frac{\tan(c+d\,x)^2\,1\mathrm{i}}{8}+\frac{3\tan(c+d\,x)}{8}-\frac{5}{12}\mathrm{i}}{a^3\,d\,(1+\tan(c+d\,x)\,1\mathrm{i})^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] x/(8*a^3) - ((3*tan(c + d*x))/8 + (tan(c + d*x)^2*1i)/8 - 5i/12)/(a^3*d*(ta
n(c + d*x)*1i + 1)^3)
```

sympy [A] time = 0.34, size = 160, normalized size = 1.82

$$\begin{cases} -\frac{\left(-4608ia^6d^2e^{10ic}e^{-2idx}-2304ia^6d^2e^{8ic}e^{-4idx}-512ia^6d^2e^{6ic}e^{-6idx}\right)e^{-12ic}}{24576a^9d^3} & \text{for } 24576a^9d^3e^{12ic} \neq 0 \\ x\left(\frac{\left(e^{6ic}+3e^{4ic}+3e^{2ic}+1\right)e^{-6ic}}{8a^3}-\frac{1}{8a^3}\right) & \text{otherwise} \end{cases} + \frac{x}{8a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] Piecewise((-(-4608*I*a**6*d**2*exp(10*I*c)*exp(-2*I*d*x) - 2304*I*a**6*d**2
*exp(8*I*c)*exp(-4*I*d*x) - 512*I*a**6*d**2*exp(6*I*c)*exp(-6*I*d*x))*exp(-
12*I*c)/(24576*a**9*d**3), Ne(24576*a**9*d**3*exp(12*I*c), 0)), (x*((exp(6*
I*c) + 3*exp(4*I*c) + 3*exp(2*I*c) + 1)*exp(-6*I*c)/(8*a**3) - 1/(8*a**3)),
 True)) + x/(8*a**3)
```

3.138 $\int \frac{\cos^2(c+dx)}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=141

$$-\frac{i}{32d\left(a^3-ia^3\tan(c+dx)\right)}+\frac{i}{8d\left(a^3+ia^3\tan(c+dx)\right)}+\frac{5x}{32a^3}+\frac{ia}{16d(a+ia\tan(c+dx))^4}+\frac{i}{12d(a+ia\tan(c+dx))^3}$$

```
[Out] 5/32*x/a^3+1/16*I*a/d/(a+I*a*tan(d*x+c))^4+1/12*I/d/(a+I*a*tan(d*x+c))^3+3/
32*I/a/d/(a+I*a*tan(d*x+c))^2-1/32*I/d/(a^3-I*a^3*tan(d*x+c))+1/8*I/d/(a^3+
I*a^3*tan(d*x+c))
```

Rubi [A] time = 0.09, antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3487, 44, 206}

$$-\frac{i}{32d\left(a^3-ia^3\tan(c+dx)\right)}+\frac{i}{8d\left(a^3+ia^3\tan(c+dx)\right)}+\frac{5x}{32a^3}+\frac{ia}{16d(a+ia\tan(c+dx))^4}+\frac{i}{12d(a+ia\tan(c+dx))^3}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (5*x)/(32*a^3) + ((I/16)*a)/(d*(a + I*a*Tan[c + d*x])^4) + (I/12)/(d*(a + I
*a*Tan[c + d*x])^3) + ((3*I)/32)/(a*d*(a + I*a*Tan[c + d*x])^2) - (I/32)/(d
*(a^3 - I*a^3*Tan[c + d*x])) + (I/8)/(d*(a^3 + I*a^3*Tan[c + d*x]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 206

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^2(c+dx)}{(a+ia\tan(c+dx))^3}\,dx = -\frac{(ia^3)\,\text{Subst}\left(\int \frac{1}{(a-x)^2(a+x)^5}\,dx, x, ia\tan(c+dx)\right)}{d}$$
$$= -\frac{(ia^3)\,\text{Subst}\left(\int \left(\frac{1}{32a^5(a-x)^2}+\frac{1}{4a^2(a+x)^5}+\frac{1}{4a^3(a+x)^4}+\frac{3}{16a^4(a+x)^3}+\frac{1}{8a^5(a+x)^2}+\frac{5}{32a^5(a^2}\right.\right.}{d}$$
$$= \frac{ia}{16d(a+ia\tan(c+dx))^4}+\frac{i}{12d(a+ia\tan(c+dx))^3}+\frac{3i}{32ad(a+ia\tan(c+dx))^2}$$
$$= \frac{5x}{32a^3}+\frac{ia}{16d(a+ia\tan(c+dx))^4}+\frac{i}{12d(a+ia\tan(c+dx))^3}+\frac{3i}{32ad(a+ia\tan(c}$$

Mathematica [A] time = 0.30, size = 115, normalized size = 0.82

$$\frac{\sec^3(c+dx)(-60i\sin(c+dx)-120dx\sin(3(c+dx))+20i\sin(3(c+dx))+15i\sin(5(c+dx))-180\cos(c+d}{768a^3d(\tan(c+dx)-i)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (Sec[c + d*x]^3*(-180*Cos[c + d*x] + (20*I)*(I + 6*d*x)*Cos[3*(c + d*x)] +
9*Cos[5*(c + d*x)] - (60*I)*Sin[c + d*x] + (20*I)*Sin[3*(c + d*x)] - 120*d*
x*Sin[3*(c + d*x)] + (15*I)*Sin[5*(c + d*x)]))/(768*a^3*d*(-I + Tan[c + d*x
])^3)
```

fricas [A] time = 0.55, size = 76, normalized size = 0.54

$$\frac{\left(120\,dxe^{(8i\,dx+8i\,c)}-12i\,e^{(10i\,dx+10i\,c)}+120i\,e^{(6i\,dx+6i\,c)}+60i\,e^{(4i\,dx+4i\,c)}+20i\,e^{(2i\,dx+2i\,c)}+3i\right)e^{(-8i\,dx-8i\,c)}}{768\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/768*(120*d*x*e^(8*I*d*x + 8*I*c) - 12*I*e^(10*I*d*x + 10*I*c) + 120*I*e^(
6*I*d*x + 6*I*c) + 60*I*e^(4*I*d*x + 4*I*c) + 20*I*e^(2*I*d*x + 2*I*c) + 3*
I)*e^(-8*I*d*x - 8*I*c)/(a^3*d)
```

giac [A] time = 1.74, size = 119, normalized size = 0.84

$$-\frac{-\frac{60i\,\log(-i\,\tan(dx+c)+1)}{a^3}+\frac{60i\,\log(-i\,\tan(dx+c)-1)}{a^3}-\frac{12\,(5\,\tan(dx+c)+7i)}{a^3(i\,\tan(dx+c)-1)}+\frac{-125i\,\tan(dx+c)^4-596\,\tan(dx+c)^3+1110i\,\tan(dx+c)^2+996}{a^3(\tan(dx+c)-i)^4}}{768\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/768*(-60*I*log(-I*tan(d*x + c) + 1)/a^3 + 60*I*log(-I*tan(d*x + c) - 1)/
a^3 - 12*(5*tan(d*x + c) + 7*I)/(a^3*(I*tan(d*x + c) - 1)) + (-125*I*tan(d*
x + c)^4 - 596*tan(d*x + c)^3 + 1110*I*tan(d*x + c)^2 + 996*tan(d*x + c) -
405*I)/(a^3*(tan(d*x + c) - I)^4))/d
```

maple [A] time = 0.41, size = 137, normalized size = 0.97

$$\frac{5i\ln(\tan(dx+c)+i)}{64d\,a^3}+\frac{1}{32a^3d(\tan(dx+c)+i)}-\frac{5i\ln(\tan(dx+c)-i)}{64a^3d}+\frac{i}{16a^3d(\tan(dx+c)-i)^4}-\frac{}{32d\,a^3\,(\text{tan}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 5/64*I/a^3/d*ln(tan(d*x+c)+I)+1/32/a^3/d/(tan(d*x+c)+I)-5/64*I/a^3/d*ln(tan
(d*x+c)-I)+1/16*I/a^3/d/(tan(d*x+c)-I)^4-3/32*I/a^3/d/(tan(d*x+c)-I)^2-1/12
/d/a^3/(tan(d*x+c)-I)^3+1/8/a^3/d/(tan(d*x+c)-I)
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 3.68, size = 124, normalized size = 0.88

$$\frac{5\,x}{32\,a^3}+\frac{\frac{1}{3\,a^3}+\frac{35\,\tan(c+d\,x)^2}{96\,a^3}-\frac{5\,\tan(c+d\,x)^4}{32\,a^3}+\frac{\tan(c+d\,x)\,5\mathrm{i}}{32\,a^3}+\frac{\tan(c+d\,x)^3\,15\mathrm{i}}{32\,a^3}}{d\,\left(-\tan\left(c+d\,x\right)^5+\tan\left(c+d\,x\right)^4\,3\mathrm{i}+2\,\tan\left(c+d\,x\right)^3+\tan\left(c+d\,x\right)^2\,2\mathrm{i}+3\,\tan\left(c+d\,x\right)-\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2/(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] (5*x)/(32*a^3) + ((tan(c + d*x)*5i)/(32*a^3) + 1/(3*a^3) + (35*tan(c + d*x)
^2)/(96*a^3) + (tan(c + d*x)^3*15i)/(32*a^3) - (5*tan(c + d*x)^4)/(32*a^3))
/(d*(3*tan(c + d*x) + tan(c + d*x)^2*2i + 2*tan(c + d*x)^3 + tan(c + d*x)^4
*3i - tan(c + d*x)^5 - 1i))
```

sympy [A] time = 0.49, size = 228, normalized size = 1.62

$$\begin{cases} -\frac{\left(100663296ia^{12}d^4e^{22ic}e^{2idx}-1006632960ia^{12}d^4e^{18ic}e^{-2idx}-503316480ia^{12}d^4e^{16ic}e^{-4idx}-167772160ia^{12}d^4e^{14ic}e^{-6idx}-25165824ia^{12}d^4e^{12ic}e^{-8idx}\right)e^{-2}}{6442450944a^{15}d^5} \\ x\left(\frac{\left(e^{10ic}+5e^{8ic}+10e^{6ic}+10e^{4ic}+5e^{2ic}+1\right)e^{-8ic}}{32a^3}-\frac{5}{32a^3}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] Piecewise((-(100663296*I*a**12*d**4*exp(22*I*c)*exp(2*I*d*x) - 1006632960*I
*a**12*d**4*exp(18*I*c)*exp(-2*I*d*x) - 503316480*I*a**12*d**4*exp(16*I*c)*
exp(-4*I*d*x) - 167772160*I*a**12*d**4*exp(14*I*c)*exp(-6*I*d*x) - 25165824
*I*a**12*d**4*exp(12*I*c)*exp(-8*I*d*x))*exp(-20*I*c)/(6442450944*a**15*d**
5), Ne(6442450944*a**15*d**5*exp(20*I*c), 0)), (x*((exp(10*I*c) + 5*exp(8*I
*c) + 10*exp(6*I*c) + 10*exp(4*I*c) + 5*exp(2*I*c) + 1)*exp(-8*I*c)/(32*a**
3) - 5/(32*a**3)), True)) + 5*x/(32*a**3)
```

3.139 $\int \frac{\cos^4(c+dx)}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=195

$$-\frac{3i}{64d\left(a^3-ia^3\tan(c+dx)\right)}+\frac{15i}{128d\left(a^3+ia^3\tan(c+dx)\right)}+\frac{21x}{128a^3}+\frac{ia^2}{40d(a+ia\tan(c+dx))^5}+\frac{3ia}{64d(a+ia\tan(c$$

```
[Out] 21/128*x/a^3-1/128*I/a/d/(a-I*a*tan(d*x+c))^2+1/40*I*a^2/d/(a+I*a*tan(d*x+c
))^5+3/64*I*a/d/(a+I*a*tan(d*x+c))^4+1/16*I/d/(a+I*a*tan(d*x+c))^3+5/64*I/a
/d/(a+I*a*tan(d*x+c))^2-3/64*I/d/(a^3-I*a^3*tan(d*x+c))+15/128*I/d/(a^3+I*a
^3*tan(d*x+c))
```

Rubi [A] time = 0.12, antiderivative size = 195, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3487, 44, 206}

$$\frac{ia^2}{40d(a+ia\tan(c+dx))^5}-\frac{3i}{64d\left(a^3-ia^3\tan(c+dx)\right)}+\frac{15i}{128d\left(a^3+ia^3\tan(c+dx)\right)}+\frac{21x}{128a^3}+\frac{3ia}{64d(a+ia\tan(c+$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (21*x)/(128*a^3) - (I/128)/(a*d*(a - I*a*Tan[c + d*x])^2) + ((I/40)*a^2)/(d
*(a + I*a*Tan[c + d*x])^5) + (((3*I)/64)*a)/(d*(a + I*a*Tan[c + d*x])^4) +
(I/16)/(d*(a + I*a*Tan[c + d*x])^3) + ((5*I)/64)/(a*d*(a + I*a*Tan[c + d*x]
)^2) - ((3*I)/64)/(d*(a^3 - I*a^3*Tan[c + d*x])) + ((15*I)/128)/(d*(a^3 + I
*a^3*Tan[c + d*x]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
 + n + 2, 0])
```

Rule 206

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^4(c+dx)}{(a+ia\tan(c+dx))^3}\,dx = -\frac{(ia^5)\,\text{Subst}\left(\int \frac{1}{(a-x)^3(a+x)^6}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{(ia^5)\,\text{Subst}\left(\int \left(\frac{1}{64a^6(a-x)^3} + \frac{3}{64a^7(a-x)^2} + \frac{1}{8a^3(a+x)^6} + \frac{3}{16a^4(a+x)^5} + \frac{3}{16a^5(a+x)^4} + \frac{5}{32a^6(a+x}\right.\right.}{d}$$

$$= -\frac{i}{128ad(a-ia\tan(c+dx))^2} + \frac{ia^2}{40d(a+ia\tan(c+dx))^5} + \frac{3ia}{64d(a+ia\tan(c+dx))^4}$$

$$= \frac{21x}{128a^3} - \frac{i}{128ad(a-ia\tan(c+dx))^2} + \frac{ia^2}{40d(a+ia\tan(c+dx))^5} + \frac{3ia}{64d(a+ia\tan(c}$$

Mathematica [A] time = 0.53, size = 137, normalized size = 0.70

$$\frac{\sec^3(c+dx)(-350i\sin(c+dx) - 840dx\sin(3(c+dx)) + 140i\sin(3(c+dx)) + 175i\sin(5(c+dx)) + 14i\sin(7(c+}{5120a^3d(\tan(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (Sec[c + d*x]^3*(-1050*Cos[c + d*x] + (140*I)*(I + 6*d*x)*Cos[3*(c + d*x)]
+ 105*Cos[5*(c + d*x)] + 6*Cos[7*(c + d*x)] - (350*I)*Sin[c + d*x] + (140*I
)*Sin[3*(c + d*x)] - 840*d*x*Sin[3*(c + d*x)] + (175*I)*Sin[5*(c + d*x)] +
(14*I)*Sin[7*(c + d*x)]))/(5120*a^3*d*(-I + Tan[c + d*x])^3)
```

fricas [A] time = 0.54, size = 98, normalized size = 0.50

$$\frac{\left(840\,dxe^{(10i\,dx+10i\,c)} - 10i\,e^{(14i\,dx+14i\,c)} - 140i\,e^{(12i\,dx+12i\,c)} + 700i\,e^{(8i\,dx+8i\,c)} + 350i\,e^{(6i\,dx+6i\,c)} + 140i\,e^{(4i\,dx+4i\,c)} + 35i}{5120\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/5120*(840*d*x*e^(10*I*d*x + 10*I*c) - 10*I*e^(14*I*d*x + 14*I*c) - 140*I*
e^(12*I*d*x + 12*I*c) + 700*I*e^(8*I*d*x + 8*I*c) + 350*I*e^(6*I*d*x + 6*I*
c) + 140*I*e^(4*I*d*x + 4*I*c) + 35*I*e^(2*I*d*x + 2*I*c) + 4*I)*e^(-10*I*d
*x - 10*I*c)/(a^3*d)
```

giac [A] time = 2.35, size = 136, normalized size = 0.70

$$-\frac{-\frac{420i\log(\tan(dx+c)+i)}{a^3} + \frac{420i\log(\tan(dx+c)-i)}{a^3} + \frac{10\left(-63i\tan(dx+c)^2+150\tan(dx+c)+91i\right)}{a^3(i\tan(dx+c)-1)^2} - \frac{959i\tan(dx+c)^5+5395\tan(dx+c)^4-12390i\,\text{ta}}{a^3(\text{ta}}}{5120\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -1/5120*(-420*I*log(tan(d*x + c) + I)/a^3 + 420*I*log(tan(d*x + c) - I)/a^3
 + 10*(-63*I*tan(d*x + c)^2 + 150*tan(d*x + c) + 91*I)/(a^3*(I*tan(d*x + c)
 - 1)^2) - (959*I*tan(d*x + c)^5 + 5395*tan(d*x + c)^4 - 12390*I*tan(d*x +
c)^3 - 14710*tan(d*x + c)^2 + 9275*I*tan(d*x + c) + 2647)/(a^3*(tan(d*x + c
) - I)^5))/d
```

maple [A] time = 0.42, size = 176, normalized size = 0.90

$$\frac{i}{128a^3d(\tan(dx+c)+i)^2} + \frac{21i\ln(\tan(dx+c)+i)}{256d\,a^3} + \frac{3}{64a^3d(\tan(dx+c)+i)} - \frac{21i\ln(\tan(dx+c)-i)}{256a^3d} + \frac{}{64a^3d(\text{ta}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 1/128*I/a^3/d/(tan(d*x+c)+I)^2+21/256*I/a^3/d*ln(tan(d*x+c)+I)+3/64/a^3/d/(
tan(d*x+c)+I)-21/256*I/a^3/d*ln(tan(d*x+c)-I)+3/64*I/a^3/d/(tan(d*x+c)-I)^4
-5/64*I/a^3/d/(tan(d*x+c)-I)^2+1/40/a^3/d/(tan(d*x+c)-I)^5-1/16/d/a^3/(tan(
d*x+c)-I)^3+15/128/a^3/d/(tan(d*x+c)-I)
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 5.04, size = 173, normalized size = 0.89

$$\frac{21\,x}{128\,a^3}+\frac{\frac{7\tan(c+d\,x)}{640\,a^3}+\frac{11\mathrm{i}}{40\,a^3}+\frac{\tan(c+d\,x)^2\,469\mathrm{i}}{640\,a^3}-\frac{21\tan(c+d\,x)^3}{32\,a^3}+\frac{\tan(c+d\,x)^4\,7\mathrm{i}}{32\,a^3}-\frac{63\tan(c+d\,x)^5}{128\,a^3}-\tan(}{d\,\left(-\tan\left(c+d\,x\right)^7\,1\mathrm{i}-3\tan\left(c+d\,x\right)^6+\tan\left(c+d\,x\right)^5\,1\mathrm{i}-5\tan\left(c+d\,x\right)^4+\tan\left(c+d\,x\right)^3\,5\mathrm{i}-\tan(c\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4/(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] (21*x)/(128*a^3) + ((7*tan(c + d*x))/(640*a^3) + 11i/(40*a^3) + (tan(c + d*
x)^2*469i)/(640*a^3) - (21*tan(c + d*x)^3)/(32*a^3) + (tan(c + d*x)^4*7i)/(
32*a^3) - (63*tan(c + d*x)^5)/(128*a^3) - (tan(c + d*x)^6*21i)/(128*a^3))/(
d*(tan(c + d*x)*3i - tan(c + d*x)^2 + tan(c + d*x)^3*5i - 5*tan(c + d*x)^4
+ tan(c + d*x)^5*1i - 3*tan(c + d*x)^6 - tan(c + d*x)^7*1i + 1))
```

sympy [A] time = 0.61, size = 296, normalized size = 1.52

$$\begin{cases} -\frac{\left(11258999068426240ia^{18}d^6e^{34ic}e^{4idx}+157625986957967360ia^{18}d^6e^{32ic}e^{2idx}-788129934789836800ia^{18}d^6e^{28ic}e^{-2idx}-394064967394918400ia^{18}\right.}{57646075230342} \\ x\left(\frac{\left(e^{14ic}+7e^{12ic}+21e^{10ic}+35e^{8ic}+35e^{6ic}+21e^{4ic}+7e^{2ic}+1\right)e^{-10ic}}{128a^3}-\frac{21}{128a^3}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] Piecewise((-(11258999068426240*I*a**18*d**6*exp(34*I*c)*exp(4*I*d*x) + 1576
25986957967360*I*a**18*d**6*exp(32*I*c)*exp(2*I*d*x) - 788129934789836800*I
*a**18*d**6*exp(28*I*c)*exp(-2*I*d*x) - 394064967394918400*I*a**18*d**6*exp
(26*I*c)*exp(-4*I*d*x) - 157625986957967360*I*a**18*d**6*exp(24*I*c)*exp(-6
*I*d*x) - 39406496739491840*I*a**18*d**6*exp(22*I*c)*exp(-8*I*d*x) - 450359
9627370496*I*a**18*d**6*exp(20*I*c)*exp(-10*I*d*x))*exp(-30*I*c)/(576460752
3034234880*a**21*d**7), Ne(5764607523034234880*a**21*d**7*exp(30*I*c), 0)),
 (x*((exp(14*I*c) + 7*exp(12*I*c) + 21*exp(10*I*c) + 35*exp(8*I*c) + 35*exp
(6*I*c) + 21*exp(4*I*c) + 7*exp(2*I*c) + 1)*exp(-10*I*c)/(128*a**3) - 21/(1
28*a**3)), True)) + 21*x/(128*a**3)
```

3.140 $\int \frac{\sec^9(c+dx)}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=119

$$-\frac{7i\sec^5(c+dx)}{15a^3d}+\frac{7\tanh^{-1}(\sin(c+dx))}{8a^3d}+\frac{7\tan(c+dx)\sec^3(c+dx)}{12a^3d}+\frac{7\tan(c+dx)\sec(c+dx)}{8a^3d}-\frac{2i\sec^7(c+}{3ad(a+ia\tan(}$$

```
[Out] 7/8*arctanh(sin(d*x+c))/a^3/d-7/15*I*sec(d*x+c)^5/a^3/d+7/8*sec(d*x+c)*tan(
d*x+c)/a^3/d+7/12*sec(d*x+c)^3*tan(d*x+c)/a^3/d-2/3*I*sec(d*x+c)^7/a/d/(a+I
*a*tan(d*x+c))^2
```

Rubi [A] time = 0.11, antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {3500, 3501, 3768, 3770}

$$-\frac{7i\sec^5(c+dx)}{15a^3d}+\frac{7\tanh^{-1}(\sin(c+dx))}{8a^3d}+\frac{7\tan(c+dx)\sec^3(c+dx)}{12a^3d}+\frac{7\tan(c+dx)\sec(c+dx)}{8a^3d}-\frac{2i\sec^7(c+}{3ad(a+ia\tan(}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^9/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (7*ArcTanh[Sin[c + d*x]])/(8*a^3*d) - (((7*I)/15)*Sec[c + d*x]^5)/(a^3*d) +
 (7*Sec[c + d*x]*Tan[c + d*x])/(8*a^3*d) + (7*Sec[c + d*x]^3*Tan[c + d*x])/
(12*a^3*d) - (((2*I)/3)*Sec[c + d*x]^7)/(a*d*(a + I*a*Tan[c + d*x])^2)
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3768

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \frac{\sec^9(c+dx)}{(a+ia\tan(c+dx))^3}\,dx = -\frac{2i\sec^7(c+dx)}{3ad(a+ia\tan(c+dx))^2} + \frac{7\int \frac{\sec^7(c+dx)}{a+ia\tan(c+dx)}\,dx}{3a^2}$$
$$= -\frac{7i\sec^5(c+dx)}{15a^3d} - \frac{2i\sec^7(c+dx)}{3ad(a+ia\tan(c+dx))^2} + \frac{7\int \sec^5(c+dx)\,dx}{3a^3}$$
$$= -\frac{7i\sec^5(c+dx)}{15a^3d} + \frac{7\sec^3(c+dx)\tan(c+dx)}{12a^3d} - \frac{2i\sec^7(c+dx)}{3ad(a+ia\tan(c+dx))^2} + \frac{7\int}{}$$
$$= -\frac{7i\sec^5(c+dx)}{15a^3d} + \frac{7\sec(c+dx)\tan(c+dx)}{8a^3d} + \frac{7\sec^3(c+dx)\tan(c+dx)}{12a^3d} - \frac{}{3ad}$$
$$= \frac{7\tanh^{-1}(\sin(c+dx))}{8a^3d} - \frac{7i\sec^5(c+dx)}{15a^3d} + \frac{7\sec(c+dx)\tan(c+dx)}{8a^3d} + \frac{7\sec^3(c}{}$$

Mathematica [A] time = 0.49, size = 113, normalized size = 0.95

$$\frac{\sec^8(c+dx)(\cos(3(c+dx))+i\sin(3(c+dx)))\left(-150i\sin(2(c+dx))+105i\sin(4(c+dx))+640\cos(2(c+dx\right.}{960a^3d(\tan(c+dx)-i)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^9/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (Sec[c + d*x]^8*(Cos[3*(c + d*x)] + I*Sin[3*(c + d*x)])*(448 + (1680*I)*Arc
Tanh[Sin[c] + Cos[c]*Tan[(d*x)/2]]*Cos[c + d*x]^5 + 640*Cos[2*(c + d*x)] -
(150*I)*Sin[2*(c + d*x)] + (105*I)*Sin[4*(c + d*x)]))/(960*a^3*d*(-I + Tan[
c + d*x])^3)
```

fricas [B] time = 0.52, size = 278, normalized size = 2.34

$$\frac{105\left(e^{(10i\,dx+10i\,c)}+5\,e^{(8i\,dx+8i\,c)}+10\,e^{(6i\,dx+6i\,c)}+10\,e^{(4i\,dx+4i\,c)}+5\,e^{(2i\,dx+2i\,c)}+1\right)\log\left(e^{(i\,dx+i\,c)}+i\right)-105\left(e^{(10i\,d}\right.}{120\left(a^3de^{(10i\,dx+10i}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/120*(105*(e^(10*I*d*x + 10*I*c) + 5*e^(8*I*d*x + 8*I*c) + 10*e^(6*I*d*x +
 6*I*c) + 10*e^(4*I*d*x + 4*I*c) + 5*e^(2*I*d*x + 2*I*c) + 1)*log(e^(I*d*x
+ I*c) + I) - 105*(e^(10*I*d*x + 10*I*c) + 5*e^(8*I*d*x + 8*I*c) + 10*e^(6*
I*d*x + 6*I*c) + 10*e^(4*I*d*x + 4*I*c) + 5*e^(2*I*d*x + 2*I*c) + 1)*log(e^
(I*d*x + I*c) - I) - 210*I*e^(9*I*d*x + 9*I*c) - 980*I*e^(7*I*d*x + 7*I*c)
- 1792*I*e^(5*I*d*x + 5*I*c) - 1580*I*e^(3*I*d*x + 3*I*c) + 210*I*e^(I*d*x
+ I*c))/(a^3*d*e^(10*I*d*x + 10*I*c) + 5*a^3*d*e^(8*I*d*x + 8*I*c) + 10*a^3
*d*e^(6*I*d*x + 6*I*c) + 10*a^3*d*e^(4*I*d*x + 4*I*c) + 5*a^3*d*e^(2*I*d*x
+ 2*I*c) + a^3*d)
```

giac [A] time = 1.94, size = 164, normalized size = 1.38

$$\frac{\frac{105\log\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right)}{a^3} - \frac{105\log\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right)}{a^3} + \frac{2\left(15\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^9+360i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^8-390\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^7-960i\tan\left(\frac{1}{2}dx+\right.\right.}{\left(\tan\right.}}{120\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/120*(105*log(tan(1/2*d*x + 1/2*c) + 1)/a^3 - 105*log(tan(1/2*d*x + 1/2*c)
 - 1)/a^3 + 2*(15*tan(1/2*d*x + 1/2*c)^9 + 360*I*tan(1/2*d*x + 1/2*c)^8 - 3
90*tan(1/2*d*x + 1/2*c)^7 - 960*I*tan(1/2*d*x + 1/2*c)^6 + 400*I*tan(1/2*d*
x + 1/2*c)^4 + 390*tan(1/2*d*x + 1/2*c)^3 - 320*I*tan(1/2*d*x + 1/2*c)^2 -
15*tan(1/2*d*x + 1/2*c) + 136*I)/((tan(1/2*d*x + 1/2*c)^2 - 1)^5*a^3))/d
```

maple [B] time = 0.41, size = 430, normalized size = 3.61

$$-\frac{i}{2a^3d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^4}+\frac{1}{8a^3d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\frac{7i}{12a^3d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^3}-\frac{3}{4a^3d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^4}+\frac{\ldots}{8a^3 \ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] -1/2*I/a^3/d/(tan(1/2*d*x+1/2*c)+1)^4+1/8/a^3/d/(tan(1/2*d*x+1/2*c)-1)+7/12
*I/a^3/d/(tan(1/2*d*x+1/2*c)-1)^3-3/4/a^3/d/(tan(1/2*d*x+1/2*c)-1)^4+13/8*I
/a^3/d/(tan(1/2*d*x+1/2*c)-1)-5/8/a^3/d/(tan(1/2*d*x+1/2*c)-1)^2-1/2*I/a^3/
d/(tan(1/2*d*x+1/2*c)-1)^4-3/2/a^3/d/(tan(1/2*d*x+1/2*c)-1)^3+1/5*I/a^3/d/(
tan(1/2*d*x+1/2*c)+1)^5-7/8/a^3/d*ln(tan(1/2*d*x+1/2*c)-1)+11/8*I/a^3/d/(ta
n(1/2*d*x+1/2*c)+1)^2+5/8/a^3/d/(tan(1/2*d*x+1/2*c)+1)^2-1/5*I/a^3/d/(tan(1
/2*d*x+1/2*c)-1)^5+3/4/a^3/d/(tan(1/2*d*x+1/2*c)+1)^4+11/8*I/a^3/d/(tan(1/2
*d*x+1/2*c)-1)^2+1/8/a^3/d/(tan(1/2*d*x+1/2*c)+1)-7/12*I/a^3/d/(tan(1/2*d*x
+1/2*c)+1)^3-3/2/a^3/d/(tan(1/2*d*x+1/2*c)+1)^3-13/8*I/a^3/d/(tan(1/2*d*x+1
/2*c)+1)+7/8/a^3/d*ln(tan(1/2*d*x+1/2*c)+1)
```

maxima [B] time = 0.45, size = 341, normalized size = 2.87

$$\frac{\frac{16\left(-\frac{15i\sin(dx+c)}{\cos(dx+c)+1}+\frac{320\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{390i\sin(dx+c)^3}{(\cos(dx+c)+1)^3}-\frac{400\sin(dx+c)^4}{(\cos(dx+c)+1)^4}+\frac{960\sin(dx+c)^6}{(\cos(dx+c)+1)^6}-\frac{390i\sin(dx+c)^7}{(\cos(dx+c)+1)^7}-\frac{360\sin(dx+c)^8}{(\cos(dx+c)+1)^8}+\frac{15i\sin(dx+c)^9}{(\cos(dx+c)+1)^9}-136\right)}{-120ia^3+\frac{600ia^3\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-\frac{1200ia^3\sin(dx+c)^4}{(\cos(dx+c)+1)^4}+\frac{1200ia^3\sin(dx+c)^6}{(\cos(dx+c)+1)^6}-\frac{600ia^3\sin(dx+c)^8}{(\cos(dx+c)+1)^8}+\frac{120ia^3\sin(dx+c)^{10}}{(\cos(dx+c)+1)^{10}}}+\frac{7\log\left(\frac{\sin(dx+\ldots}{\cos(dx+c\ldots}\right.}{a^3}\ldots}{8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/8*(16*(-15*I*sin(d*x + c)/(cos(d*x + c) + 1) + 320*sin(d*x + c)^2/(cos(d*
x + c) + 1)^2 + 390*I*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 - 400*sin(d*x + c
)^4/(cos(d*x + c) + 1)^4 + 960*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 - 390*I*
sin(d*x + c)^7/(cos(d*x + c) + 1)^7 - 360*sin(d*x + c)^8/(cos(d*x + c) + 1)
^8 + 15*I*sin(d*x + c)^9/(cos(d*x + c) + 1)^9 - 136)/(-120*I*a^3 + 600*I*a^
3*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 1200*I*a^3*sin(d*x + c)^4/(cos(d*x
+ c) + 1)^4 + 1200*I*a^3*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 - 600*I*a^3*si
n(d*x + c)^8/(cos(d*x + c) + 1)^8 + 120*I*a^3*sin(d*x + c)^10/(cos(d*x + c)
 + 1)^10) + 7*log(sin(d*x + c)/(cos(d*x + c) + 1) + 1)/a^3 - 7*log(sin(d*x
+ c)/(cos(d*x + c) + 1) - 1)/a^3)/d
```

mupad [B] time = 6.08, size = 150, normalized size = 1.26

$$\frac{7\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{4\,a^3\,d}+\frac{\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9}{4}+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8\,6\mathrm{i}-\frac{13\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{2}-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6\,16\mathrm{i}+\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4\,20\mathrm{i}}{3}+\frac{13\tan\ldots}{\ldots}}{a^3\,d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-1\right)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^9*(a + a*tan(c + d*x)*1i)^3),x)
```

```
[Out] (7*atanh(tan(c/2 + (d*x)/2)))/(4*a^3*d) + ((13*tan(c/2 + (d*x)/2)^3)/2 - (t
an(c/2 + (d*x)/2)^2*16i)/3 - tan(c/2 + (d*x)/2)/4 + (tan(c/2 + (d*x)/2)^4*2
0i)/3 - tan(c/2 + (d*x)/2)^6*16i - (13*tan(c/2 + (d*x)/2)^7)/2 + tan(c/2 +
(d*x)/2)^8*6i + tan(c/2 + (d*x)/2)^9/4 + 34i/15)/(a^3*d*(tan(c/2 + (d*x)/2)
^2 - 1)^5)
```

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

$$\frac{i\int\frac{\sec^9(c+dx)}{\tan^3(c+dx)-3i\tan^2(c+dx)-3\tan(c+dx)+i}\,dx}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**9/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] I*Integral(sec(c + d*x)**9/(tan(c + d*x)**3 - 3*I*tan(c + d*x)**2 - 3*tan(c
 + d*x) + I), x)/a**3
```

3.141 $\int \frac{\sec^7(c+dx)}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=93

$$-\frac{5i\sec^3(c+dx)}{3a^3d}+\frac{5\tanh^{-1}(\sin(c+dx))}{2a^3d}+\frac{5\tan(c+dx)\sec(c+dx)}{2a^3d}-\frac{2i\sec^5(c+dx)}{ad(a+ia\tan(c+dx))^2}$$

```
[Out] 5/2*arctanh(sin(d*x+c))/a^3/d-5/3*I*sec(d*x+c)^3/a^3/d+5/2*sec(d*x+c)*tan(d
*x+c)/a^3/d-2*I*sec(d*x+c)^5/a/d/(a+I*a*tan(d*x+c))^2
```

Rubi [A] time = 0.10, antiderivative size = 93, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {3500, 3501, 3768, 3770}

$$-\frac{5i\sec^3(c+dx)}{3a^3d}+\frac{5\tanh^{-1}(\sin(c+dx))}{2a^3d}+\frac{5\tan(c+dx)\sec(c+dx)}{2a^3d}-\frac{2i\sec^5(c+dx)}{ad(a+ia\tan(c+dx))^2}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^7/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (5*ArcTanh[Sin[c + d*x]])/(2*a^3*d) - (((5*I)/3)*Sec[c + d*x]^3)/(a^3*d) +
(5*Sec[c + d*x]*Tan[c + d*x])/(2*a^3*d) - ((2*I)*Sec[c + d*x]^5)/(a*d*(a +
I*a*Tan[c + d*x])^2)
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3768

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \frac{\sec^7(c+dx)}{(a+ia\tan(c+dx))^3}\,dx = -\frac{2i\sec^5(c+dx)}{ad(a+ia\tan(c+dx))^2} + \frac{5\int \frac{\sec^5(c+dx)}{a+ia\tan(c+dx)}\,dx}{a^2}$$
$$= -\frac{5i\sec^3(c+dx)}{3a^3d} - \frac{2i\sec^5(c+dx)}{ad(a+ia\tan(c+dx))^2} + \frac{5\int \sec^3(c+dx)\,dx}{a^3}$$
$$= -\frac{5i\sec^3(c+dx)}{3a^3d} + \frac{5\sec(c+dx)\tan(c+dx)}{2a^3d} - \frac{2i\sec^5(c+dx)}{ad(a+ia\tan(c+dx))^2} + \frac{5\int \mathrm{se}$$
$$= \frac{5\tanh^{-1}(\sin(c+dx))}{2a^3d} - \frac{5i\sec^3(c+dx)}{3a^3d} + \frac{5\sec(c+dx)\tan(c+dx)}{2a^3d} - \frac{2i\,\mathrm{sec}}{ad(a+ia}$$

Mathematica [**A**] time = 0.43, size = 63, normalized size = 0.68

$$\frac{60\tanh^{-1}\left(\cos(c)\tan\left(\frac{dx}{2}\right)+\sin(c)\right) - i\sec^3(c+dx)(-9i\sin(2(c+dx)) + 24\cos(2(c+dx)) + 20)}{12a^3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^7/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (60*ArcTanh[Sin[c] + Cos[c]*Tan[(d*x)/2]] - I*Sec[c + d*x]^3*(20 + 24*Cos[2
*(c + d*x)] - (9*I)*Sin[2*(c + d*x)]))/(12*a^3*d)
```

fricas [**B**] time = 0.75, size = 182, normalized size = 1.96

$$\frac{15\left(e^{(6i\,dx+6i\,c)} + 3\,e^{(4i\,dx+4i\,c)} + 3\,e^{(2i\,dx+2i\,c)} + 1\right)\log\left(e^{(i\,dx+i\,c)} + i\right) - 15\left(e^{(6i\,dx+6i\,c)} + 3\,e^{(4i\,dx+4i\,c)} + 3\,e^{(2i\,dx+2i\,c)} + \right.}{6\left(a^3de^{(6i\,dx+6i\,c)} + 3\,a^3de^{(4i\,dx+4i\,c)} + 3\,a^3de^{(2i\,dx+2i\,c)}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/6*(15*(e^(6*I*d*x + 6*I*c) + 3*e^(4*I*d*x + 4*I*c) + 3*e^(2*I*d*x + 2*I*c
) + 1)*log(e^(I*d*x + I*c) + I) - 15*(e^(6*I*d*x + 6*I*c) + 3*e^(4*I*d*x +
4*I*c) + 3*e^(2*I*d*x + 2*I*c) + 1)*log(e^(I*d*x + I*c) - I) - 30*I*e^(5*I*
d*x + 5*I*c) - 80*I*e^(3*I*d*x + 3*I*c) - 66*I*e^(I*d*x + I*c))/(a^3*d*e^(6
*I*d*x + 6*I*c) + 3*a^3*d*e^(4*I*d*x + 4*I*c) + 3*a^3*d*e^(2*I*d*x + 2*I*c)
 + a^3*d)
```

giac [**A**] time = 1.54, size = 112, normalized size = 1.20

$$\frac{\frac{15\log\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right)}{a^3} - \frac{15\log\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right)}{a^3} - \frac{2\left(9\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5 - 18i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^4 + 48i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2 - 9\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right) - 22\right.}{\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1\right)^3a^3}}{6d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/6*(15*log(tan(1/2*d*x + 1/2*c) + 1)/a^3 - 15*log(tan(1/2*d*x + 1/2*c) - 1
)/a^3 - 2*(9*tan(1/2*d*x + 1/2*c)^5 - 18*I*tan(1/2*d*x + 1/2*c)^4 + 48*I*ta
n(1/2*d*x + 1/2*c)^2 - 9*tan(1/2*d*x + 1/2*c) - 22*I)/((tan(1/2*d*x + 1/2*c
)^2 - 1)^3*a^3))/d
```

maple [B] time = 0.40, size = 258, normalized size = 2.77

$$-\frac{i}{3a^3d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^3}-\frac{3}{2a^3d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2}-\frac{i}{2a^3d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2}-\frac{3}{2a^3d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\frac{}{2a^3d\left(\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] -1/3*I/a^3/d/(tan(1/2*d*x+1/2*c)-1)^3-3/2/a^3/d/(tan(1/2*d*x+1/2*c)-1)^2-1/
2*I/a^3/d/(tan(1/2*d*x+1/2*c)-1)^2-3/2/a^3/d/(tan(1/2*d*x+1/2*c)-1)+7/2*I/a
^3/d/(tan(1/2*d*x+1/2*c)-1)-5/2/a^3/d*ln(tan(1/2*d*x+1/2*c)-1)+1/3*I/a^3/d/
(tan(1/2*d*x+1/2*c)+1)^3+3/2/a^3/d/(tan(1/2*d*x+1/2*c)+1)^2-1/2*I/a^3/d/(ta
n(1/2*d*x+1/2*c)+1)^2-3/2/a^3/d/(tan(1/2*d*x+1/2*c)+1)-7/2*I/a^3/d/(tan(1/2
*d*x+1/2*c)+1)+5/2/a^3/d*ln(tan(1/2*d*x+1/2*c)+1)
```

maxima [B] time = 0.44, size = 215, normalized size = 2.31

$$\frac{\frac{4\left(-\frac{9i\sin(dx+c)}{\cos(dx+c)+1}-\frac{48\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{18\sin(dx+c)^4}{(\cos(dx+c)+1)^4}+\frac{9i\sin(dx+c)^5}{(\cos(dx+c)+1)^5}+22\right)}{6i\,a^3-\frac{18i\,a^3\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{18i\,a^3\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{6i\,a^3\sin(dx+c)^6}{(\cos(dx+c)+1)^6}}+\frac{5\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{a^3}-\frac{5\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right)}{a^3}}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/2*(4*(-9*I*sin(d*x + c)/(cos(d*x + c) + 1) - 48*sin(d*x + c)^2/(cos(d*x +
 c) + 1)^2 + 18*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + 9*I*sin(d*x + c)^5/(c
os(d*x + c) + 1)^5 + 22)/(6*I*a^3 - 18*I*a^3*sin(d*x + c)^2/(cos(d*x + c) +
 1)^2 + 18*I*a^3*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 6*I*a^3*sin(d*x + c)
^6/(cos(d*x + c) + 1)^6) + 5*log(sin(d*x + c)/(cos(d*x + c) + 1) + 1)/a^3 -
 5*log(sin(d*x + c)/(cos(d*x + c) + 1) - 1)/a^3)/d
```

mupad [B] time = 5.44, size = 135, normalized size = 1.45

$$\frac{5\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{a^3\,d}+\frac{\frac{3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{a^3}-\frac{3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{a^3}-\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2 16\mathrm{i}}{a^3}+\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4 6\mathrm{i}}{a^3}+\frac{22\mathrm{i}}{3\,a^3}}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6-3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^7*(a + a*tan(c + d*x)*1i)^3),x)
```

```
[Out] (5*atanh(tan(c/2 + (d*x)/2)))/(a^3*d) + ((tan(c/2 + (d*x)/2)^4*6i)/a^3 - (t
an(c/2 + (d*x)/2)^2*16i)/a^3 - (3*tan(c/2 + (d*x)/2)^5)/a^3 + 22i/(3*a^3) +
 (3*tan(c/2 + (d*x)/2))/a^3)/(d*(3*tan(c/2 + (d*x)/2)^2 - 3*tan(c/2 + (d*x)
/2)^4 + tan(c/2 + (d*x)/2)^6 - 1))
```

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

$$\frac{i\int\frac{\sec^7(c+dx)}{\tan^3(c+dx)-3i\tan^2(c+dx)-3\tan(c+dx)+i}\,dx}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**7/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] I*Integral(sec(c + d*x)**7/(tan(c + d*x)**3 - 3*I*tan(c + d*x)**2 - 3*tan(c
 + d*x) + I), x)/a**3
```

3.142 $\int \frac{\sec^5(c+dx)}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=65

$$\frac{3i\sec(c+dx)}{a^3d}-\frac{3\tanh^{-1}(\sin(c+dx))}{a^3d}+\frac{2i\sec^3(c+dx)}{ad(a+ia\tan(c+dx))^2}$$

```
[Out] -3*arctanh(sin(d*x+c))/a^3/d+3*I*sec(d*x+c)/a^3/d+2*I*sec(d*x+c)^3/a/d/(a+I
*a*tan(d*x+c))^2
```

Rubi [A] time = 0.09, antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3500, 3501, 3770}

$$\frac{3i\sec(c+dx)}{a^3d}-\frac{3\tanh^{-1}(\sin(c+dx))}{a^3d}+\frac{2i\sec^3(c+dx)}{ad(a+ia\tan(c+dx))^2}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^5/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (-3*ArcTanh[Sin[c + d*x]])/(a^3*d) + ((3*I)*Sec[c + d*x])/(a^3*d) + ((2*I)*
Sec[c + d*x]^3)/(a*d*(a + I*a*Tan[c + d*x])^2)
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^5(c+dx)}{(a+ia\tan(c+dx))^3}\,dx &= \frac{2i\sec^3(c+dx)}{ad(a+ia\tan(c+dx))^2}-\frac{3\int \frac{\sec^3(c+dx)}{a+ia\tan(c+dx)}\,dx}{a^2}\\ &= \frac{3i\sec(c+dx)}{a^3d}+\frac{2i\sec^3(c+dx)}{ad(a+ia\tan(c+dx))^2}-\frac{3\int \sec(c+dx)\,dx}{a^3}\\ &= -\frac{3\tanh^{-1}(\sin(c+dx))}{a^3d}+\frac{3i\sec(c+dx)}{a^3d}+\frac{2i\sec^3(c+dx)}{ad(a+ia\tan(c+dx))^2}\end{aligned}$$

Mathematica [A] time = 0.34, size = 108, normalized size = 1.66

$$\frac{\sec^3(c+dx)(-\sin(dx)+i\cos(dx))^3\left((\tan(c+dx)-5i)(\cos(2c-dx)+i\sin(2c-dx))+6(\cos(3c)+i\sin(3c))\tan\right.}{a^3d(\tan(c+dx)-i)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^5/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (Sec[c + d*x]^3*(I*Cos[d*x] - Sin[d*x])^3*(6*ArcTanh[Sin[c] + Cos[c]*Tan[(d
*x)/2]]*(Cos[3*c] + I*Sin[3*c]) + (Cos[2*c - d*x] + I*Sin[2*c - d*x])*(-5*I
 + Tan[c + d*x])))/(a^3*d*(-I + Tan[c + d*x])^3)
```

fricas [A] time = 0.54, size = 112, normalized size = 1.72

$$-\frac{3\left(e^{(3i\,dx+3i\,c)}+e^{(i\,dx+i\,c)}\right)\log\left(e^{(i\,dx+i\,c)}+i\right)-3\left(e^{(3i\,dx+3i\,c)}+e^{(i\,dx+i\,c)}\right)\log\left(e^{(i\,dx+i\,c)}-i\right)-6i\,e^{(2i\,dx+2i\,c)}-4i}{a^3de^{(3i\,dx+3i\,c)}+a^3de^{(i\,dx+i\,c)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] -(3*(e^(3*I*d*x + 3*I*c) + e^(I*d*x + I*c))*log(e^(I*d*x + I*c) + I) - 3*(e
^(3*I*d*x + 3*I*c) + e^(I*d*x + I*c))*log(e^(I*d*x + I*c) - I) - 6*I*e^(2*I
*d*x + 2*I*c) - 4*I)/(a^3*d*e^(3*I*d*x + 3*I*c) + a^3*d*e^(I*d*x + I*c))
```

giac [A] time = 1.55, size = 110, normalized size = 1.69

$$-\frac{\frac{3\log\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right)}{a^3}-\frac{3\log\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right)}{a^3}-\frac{2\left(4\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-5\right)}{\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+i\right)a^3}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -(3*log(tan(1/2*d*x + 1/2*c) + 1)/a^3 - 3*log(tan(1/2*d*x + 1/2*c) - 1)/a^3
 - 2*(4*tan(1/2*d*x + 1/2*c)^2 - I*tan(1/2*d*x + 1/2*c) - 5)/((tan(1/2*d*x
+ 1/2*c)^3 - I*tan(1/2*d*x + 1/2*c)^2 - tan(1/2*d*x + 1/2*c) + I)*a^3))/d
```

maple [A] time = 0.39, size = 108, normalized size = 1.66

$$-\frac{i}{a^3d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\frac{3\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^3d}+\frac{i}{a^3d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}-\frac{3\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{a^3d}+\frac{8}{a^3d\left(\tan\left(\frac{dx}{2}\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] -I/a^3/d/(tan(1/2*d*x+1/2*c)-1)+3/a^3/d*ln(tan(1/2*d*x+1/2*c)-1)+I/a^3/d/(t
an(1/2*d*x+1/2*c)+1)-3/a^3/d*ln(tan(1/2*d*x+1/2*c)+1)+8/a^3/d/(tan(1/2*d*x+
1/2*c)-I)
```

maxima [B] time = 0.54, size = 329, normalized size = 5.06

$$\frac{(6\cos(3dx+3c)+6\cos(dx+c)+6i\sin(3dx+3c)+6i\sin(dx+c))\arctan(\cos(dx+c),\sin(dx+c)+1)\ -}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] ((6*cos(3*d*x + 3*c) + 6*cos(d*x + c) + 6*I*sin(3*d*x + 3*c) + 6*I*sin(d*x
+ c))*arctan2(cos(d*x + c), sin(d*x + c) + 1) + (6*cos(3*d*x + 3*c) + 6*cos
(d*x + c) + 6*I*sin(3*d*x + 3*c) + 6*I*sin(d*x + c))*arctan2(cos(d*x + c),
-sin(d*x + c) + 1) - (-3*I*cos(3*d*x + 3*c) - 3*I*cos(d*x + c) + 3*sin(3*d*
x + 3*c) + 3*sin(d*x + c))*log(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*sin(d*x
+ c) + 1) - (3*I*cos(3*d*x + 3*c) + 3*I*cos(d*x + c) - 3*sin(3*d*x + 3*c) -
 3*sin(d*x + c))*log(cos(d*x + c)^2 + sin(d*x + c)^2 - 2*sin(d*x + c) + 1)
+ 12*cos(2*d*x + 2*c) + 12*I*sin(2*d*x + 2*c) + 8)/((-2*I*a^3*cos(3*d*x + 3
*c) - 2*I*a^3*cos(d*x + c) + 2*a^3*sin(3*d*x + 3*c) + 2*a^3*sin(d*x + c))*d
)
```

mupad [B] time = 3.77, size = 105, normalized size = 1.62

$$-\frac{6\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{a^3\,d}-\frac{\frac{2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{a^3}+\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2\,8\mathrm{i}}{a^3}-\frac{10\mathrm{i}}{a^3}}{d\,\left(-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3\,1\mathrm{i}-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,1\mathrm{i}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^3),x)
```

```
[Out] - (6*atanh(tan(c/2 + (d*x)/2)))/(a^3*d) - ((tan(c/2 + (d*x)/2)^2*8i)/a^3 -
10i/a^3 + (2*tan(c/2 + (d*x)/2))/a^3)/(d*(tan(c/2 + (d*x)/2)*1i - tan(c/2 +
 (d*x)/2)^2 - tan(c/2 + (d*x)/2)^3*1i + 1))
```

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

$$\frac{i\int\frac{\sec^5(c+dx)}{\tan^3(c+dx)-3i\tan^2(c+dx)-3\tan(c+dx)+i}\,dx}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**5/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] I*Integral(sec(c + d*x)**5/(tan(c + d*x)**3 - 3*I*tan(c + d*x)**2 - 3*tan(c
 + d*x) + I), x)/a**3
```

3.143 $\int \frac{\sec^3(c+dx)}{(a+ia\tan(c+dx))^3} dx$

Optimal. Leaf size=32

$$\frac{i\sec^3(c+dx)}{3d(a+ia\tan(c+dx))^3}$$

[Out] 1/3*I*sec(d*x+c)^3/d/(a+I*a*tan(d*x+c))^3

Rubi [A] time = 0.04, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.042, Rules used = {3488}

$$\frac{i\sec^3(c+dx)}{3d(a+ia\tan(c+dx))^3}$$

Antiderivative was successfully verified.

[In] Int[Sec[c + d*x]^3/(a + I*a*Tan[c + d*x])^3,x]

[Out] ((I/3)*Sec[c + d*x]^3)/(d*(a + I*a*Tan[c + d*x])^3)

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rubi steps

$$\int \frac{\sec^3(c+dx)}{(a+ia\tan(c+dx))^3} dx = \frac{i\sec^3(c+dx)}{3d(a+ia\tan(c+dx))^3}$$

Mathematica [A] time = 0.07, size = 32, normalized size = 1.00

$$\frac{i\sec^3(c+dx)}{3d(a+ia\tan(c+dx))^3}$$

Antiderivative was successfully verified.

[In] Integrate[Sec[c + d*x]^3/(a + I*a*Tan[c + d*x])^3,x]

[Out] ((I/3)*Sec[c + d*x]^3)/(d*(a + I*a*Tan[c + d*x])^3)

fricas [A] time = 0.51, size = 17, normalized size = 0.53

$$\frac{i e^{(-3i dx - 3i c)}}{3 a^3 d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")

[Out] 1/3*I*e^(-3*I*d*x - 3*I*c)/(a^3*d)

giac [A] time = 1.70, size = 36, normalized size = 1.12

$$\frac{2\left(3\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1\right)}{3a^3d\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-i\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

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

maple [A] time = 0.45, size = 57, normalized size = 1.78

$$\frac{\frac{2}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i}-\frac{8}{3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{3}}+\frac{4i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{2}}}{a^{3}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 2/d/a^3*(1/(tan(1/2*d*x+1/2*c)-I)-4/3/(tan(1/2*d*x+1/2*c)-I)^3+2*I/(tan(1/2
*d*x+1/2*c)-I)^2)
```

maxima [A] time = 0.37, size = 29, normalized size = 0.91

$$\frac{i\cos\left(3\,dx+3\,c\right)+\sin\left(3\,dx+3\,c\right)}{3\,a^{3}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/3*(I*cos(3*d*x + 3*c) + sin(3*d*x + 3*c))/(a^3*d)
```

mupad [B] time = 3.44, size = 68, normalized size = 2.12

$$-\frac{2\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{2}\,3\mathrm{i}-\mathrm{i}\right)}{3\,a^{3}\,d\,\left(-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{3}\,1\mathrm{i}-3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{2}+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,3\mathrm{i}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^3),x)
```

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

sympy [A] time = 2.09, size = 80, normalized size = 2.50

$$\begin{cases} -\frac{\sec^{3}\left(c+dx\right)}{3a^{3}d\tan^{3}\left(c+dx\right)-9ia^{3}d\tan^{2}\left(c+dx\right)-9a^{3}d\tan\left(c+dx\right)+3ia^{3}d} & \text{for}\: d \neq 0 \\ \frac{x\sec^{3}\left(c\right)}{\left(ia\tan\left(c\right)+a\right)^{3}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] Piecewise((-sec(c + d*x)**3/(3*a**3*d*tan(c + d*x)**3 - 9*I*a**3*d*tan(c +
d*x)**2 - 9*a**3*d*tan(c + d*x) + 3*I*a**3*d), Ne(d, 0)), (x*sec(c)**3/(I*a
*tan(c) + a)**3, True))
```

3.144 $\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=98

$$\frac{2i\sec(c+dx)}{15d\left(a^3+ia^3\tan(c+dx)\right)}+\frac{2i\sec(c+dx)}{15ad(a+ia\tan(c+dx))^2}+\frac{i\sec(c+dx)}{5d(a+ia\tan(c+dx))^3}$$

```
[Out] 1/5*I*sec(d*x+c)/d/(a+I*a*tan(d*x+c))^3+2/15*I*sec(d*x+c)/a/d/(a+I*a*tan(d*
x+c))^2+2/15*I*sec(d*x+c)/d/(a^3+I*a^3*tan(d*x+c))
```

Rubi [A] time = 0.08, antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {3502, 3488}

$$\frac{2i\sec(c+dx)}{15d\left(a^3+ia^3\tan(c+dx)\right)}+\frac{2i\sec(c+dx)}{15ad(a+ia\tan(c+dx))^2}+\frac{i\sec(c+dx)}{5d(a+ia\tan(c+dx))^3}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] ((I/5)*Sec[c + d*x])/(d*(a + I*a*Tan[c + d*x])^3) + (((2*I)/15)*Sec[c + d*x
])/(a*d*(a + I*a*Tan[c + d*x])^2) + (((2*I)/15)*Sec[c + d*x])/(d*(a^3 + I*a
^3*Tan[c + d*x]))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3502

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

Rubi steps

$$\begin{aligned}\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^3}\,dx &= \frac{i\sec(c+dx)}{5d(a+ia\tan(c+dx))^3}+\frac{2\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^2}\,dx}{5a}\\ &= \frac{i\sec(c+dx)}{5d(a+ia\tan(c+dx))^3}+\frac{2i\sec(c+dx)}{15ad(a+ia\tan(c+dx))^2}+\frac{2\int \frac{\sec(c+dx)}{a+ia\tan(c+dx)}\,dx}{15a^2}\\ &= \frac{i\sec(c+dx)}{5d(a+ia\tan(c+dx))^3}+\frac{2i\sec(c+dx)}{15ad(a+ia\tan(c+dx))^2}+\frac{2i\sec(c+dx)}{15d\left(a^3+ia^3\tan(c+dx)\right)}\end{aligned}$$

Mathematica [A] time = 0.18, size = 54, normalized size = 0.55

$$-\frac{\sec^3(c+dx)(6i\sin(2(c+dx))+9\cos(2(c+dx))+5)}{30a^3d(\tan(c+dx)-i)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] -1/30*(Sec[c + d*x]^3*(5 + 9*Cos[2*(c + d*x)] + (6*I)*Sin[2*(c + d*x)]))/(a
^3*d*(-I + Tan[c + d*x])^3)
```

fricas [A] time = 0.49, size = 41, normalized size = 0.42

$$\frac{\left(15i\,e^{(4i\,dx+4i\,c)} + 10i\,e^{(2i\,dx+2i\,c)} + 3i\right)e^{(-5i\,dx-5i\,c)}}{60\,a^3 d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/60*(15*I*e^(4*I*d*x + 4*I*c) + 10*I*e^(2*I*d*x + 2*I*c) + 3*I)*e^(-5*I*d*
x - 5*I*c)/(a^3*d)
```

giac [A] time = 1.12, size = 73, normalized size = 0.74

$$\frac{2\left(15\,\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)^4 - 30i\,\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)^3 - 40\,\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right)^2 + 20i\,\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) + 7\right)}{15\,a^3 d\left(\tan\left(\frac{1}{2}\,dx + \frac{1}{2}\,c\right) - i\right)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 2/15*(15*tan(1/2*d*x + 1/2*c)^4 - 30*I*tan(1/2*d*x + 1/2*c)^3 - 40*tan(1/2*
d*x + 1/2*c)^2 + 20*I*tan(1/2*d*x + 1/2*c) + 7)/(a^3*d*(tan(1/2*d*x + 1/2*c
) - I)^5)
```

maple [A] time = 0.23, size = 90, normalized size = 0.92

$$\frac{\frac{4i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^2} + \frac{2}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i} - \frac{16}{3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^3} + \frac{8}{5\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^5} - \frac{4i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^4}}{d\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 2/d/a^3*(2*I/(tan(1/2*d*x+1/2*c)-I)^2+1/(tan(1/2*d*x+1/2*c)-I)-8/3/(tan(1/2
*d*x+1/2*c)-I)^3+4/5/(tan(1/2*d*x+1/2*c)-I)^5-2*I/(tan(1/2*d*x+1/2*c)-I)^4)
```

maxima [A] time = 0.42, size = 69, normalized size = 0.70

$$\frac{3i\,\cos\left(5\,dx + 5\,c\right) + 10i\,\cos\left(3\,dx + 3\,c\right) + 15i\,\cos\left(dx + c\right) + 3\,\sin\left(5\,dx + 5\,c\right) + 10\,\sin\left(3\,dx + 3\,c\right) + 15\,\sin(}{60\,a^3 d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/60*(3*I*cos(5*d*x + 5*c) + 10*I*cos(3*d*x + 3*c) + 15*I*cos(d*x + c) + 3*
sin(5*d*x + 5*c) + 10*sin(3*d*x + 3*c) + 15*sin(d*x + c))/(a^3*d)
```

mupad [B] time = 3.68, size = 133, normalized size = 1.36

$$\frac{2\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4 15\mathrm{i} + 30\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3 - \tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2 40\mathrm{i} - 20\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right) + 7\mathrm{i}\right)}{15\,a^3\,d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5 1\mathrm{i} + 5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4 - \tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3 10\mathrm{i} - 10\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2 + \tan\left(\frac{c}{2}+\frac{d\,x}{2}\right) 5\mathrm{i} + 1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^3),x)
```

```
[Out] (2*(30*tan(c/2 + (d*x)/2)^3 - tan(c/2 + (d*x)/2)^2*40i - 20*tan(c/2 + (d*x)
/2) + tan(c/2 + (d*x)/2)^4*15i + 7i))/(15*a^3*d*(tan(c/2 + (d*x)/2)*5i - 10
*tan(c/2 + (d*x)/2)^2 - tan(c/2 + (d*x)/2)^3*10i + 5*tan(c/2 + (d*x)/2)^4 +
 tan(c/2 + (d*x)/2)^5*1i + 1))
```

sympy [A] time = 2.18, size = 219, normalized size = 2.23

$$\begin{cases} \frac{2\tan^{2}(c+dx)\sec(c+dx)}{15a^{3}d\tan^{3}(c+dx)-45ia^{3}d\tan^{2}(c+dx)-45a^{3}d\tan(c+dx)+15ia^{3}d} - \frac{6i\tan(c+dx)\sec(c+dx)}{15a^{3}d\tan^{3}(c+dx)-45ia^{3}d\tan^{2}(c+dx)-45a^{3}d\tan(c+dx)+15ia^{3}d} - \frac{}{15a^{3}d\tan^{3}} \\ \frac{x\sec(c)}{(ia\tan(c)+a)^{3}} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] Piecewise((2*tan(c + d*x)**2*sec(c + d*x)/(15*a**3*d*tan(c + d*x)**3 - 45*I
*a**3*d*tan(c + d*x)**2 - 45*a**3*d*tan(c + d*x) + 15*I*a**3*d) - 6*I*tan(c
 + d*x)*sec(c + d*x)/(15*a**3*d*tan(c + d*x)**3 - 45*I*a**3*d*tan(c + d*x)*
*2 - 45*a**3*d*tan(c + d*x) + 15*I*a**3*d) - 7*sec(c + d*x)/(15*a**3*d*tan(
c + d*x)**3 - 45*I*a**3*d*tan(c + d*x)**2 - 45*a**3*d*tan(c + d*x) + 15*I*a
**3*d), Ne(d, 0)), (x*sec(c)/(I*a*tan(c) + a)**3, True))
```

3.145 $\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=101

$$-\frac{4\sin^3(c+dx)}{35a^3d}+\frac{12\sin(c+dx)}{35a^3d}+\frac{8i\cos^3(c+dx)}{35d\left(a^3+ia^3\tan(c+dx)\right)}+\frac{i\cos(c+dx)}{7d(a+ia\tan(c+dx))^3}$$

```
[Out] 12/35*sin(d*x+c)/a^3/d-4/35*sin(d*x+c)^3/a^3/d+1/7*I*cos(d*x+c)/d/(a+I*a*ta
n(d*x+c))^3+8/35*I*cos(d*x+c)^3/d/(a^3+I*a^3*tan(d*x+c))
```

Rubi [A] time = 0.08, antiderivative size = 101, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {3502, 3500, 2633}

$$-\frac{4\sin^3(c+dx)}{35a^3d}+\frac{12\sin(c+dx)}{35a^3d}+\frac{8i\cos^3(c+dx)}{35d\left(a^3+ia^3\tan(c+dx)\right)}+\frac{i\cos(c+dx)}{7d(a+ia\tan(c+dx))^3}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (12*Sin[c + d*x])/(35*a^3*d) - (4*Sin[c + d*x]^3)/(35*a^3*d) + ((I/7)*Cos[c
 + d*x])/(d*(a + I*a*Tan[c + d*x])^3) + (((8*I)/35)*Cos[c + d*x]^3)/(d*(a^3
 + I*a^3*Tan[c + d*x]))
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3502

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

Rubi steps

$$\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^3}\,dx = \frac{i\cos(c+dx)}{7d(a+ia\tan(c+dx))^3} + \frac{4\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^2}\,dx}{7a}$$
$$= \frac{i\cos(c+dx)}{7d(a+ia\tan(c+dx))^3} + \frac{8i\cos^3(c+dx)}{35d\left(a^3+ia^3\tan(c+dx)\right)} + \frac{12\int \cos^3(c+dx)\,dx}{35a^3}$$
$$= \frac{i\cos(c+dx)}{7d(a+ia\tan(c+dx))^3} + \frac{8i\cos^3(c+dx)}{35d\left(a^3+ia^3\tan(c+dx)\right)} - \frac{12\,\mathrm{Subst}\left(\int\left(1-x^2\right)dx, x, -\right.}{35a^3d}$$
$$= \frac{12\sin(c+dx)}{35a^3d} - \frac{4\sin^3(c+dx)}{35a^3d} + \frac{i\cos(c+dx)}{7d(a+ia\tan(c+dx))^3} + \frac{8i\cos^3(c+dx)}{35d\left(a^3+ia^3\tan(c+d\right.}$$

Mathematica [A] time = 0.22, size = 76, normalized size = 0.75

$$-\frac{\sec^3(c+dx)(56i\sin(2(c+dx))-20i\sin(4(c+dx))+84\cos(2(c+dx))-15\cos(4(c+dx))+35)}{280a^3d(\tan(c+dx)-i)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] -1/280*(Sec[c + d*x]^3*(35 + 84*Cos[2*(c + d*x)] - 15*Cos[4*(c + d*x)] + (5
6*I)*Sin[2*(c + d*x)] - (20*I)*Sin[4*(c + d*x)]))/(a^3*d*(-I + Tan[c + d*x]
)^3)
```

fricas [A] time = 0.60, size = 63, normalized size = 0.62

$$\frac{\left(-35i\,e^{(8i\,dx+8i\,c)}+140i\,e^{(6i\,dx+6i\,c)}+70i\,e^{(4i\,dx+4i\,c)}+28i\,e^{(2i\,dx+2i\,c)}+5i\right)e^{(-7i\,dx-7i\,c)}}{560\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/560*(-35*I*e^(8*I*d*x + 8*I*c) + 140*I*e^(6*I*d*x + 6*I*c) + 70*I*e^(4*I*
d*x + 4*I*c) + 28*I*e^(2*I*d*x + 2*I*c) + 5*I)*e^(-7*I*d*x - 7*I*c)/(a^3*d)
```

giac [A] time = 1.53, size = 119, normalized size = 1.18

$$\frac{\frac{35}{a^3\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+i\right)} + \frac{525\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^6-1960i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5-4025\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^4+4480i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3+3143\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1176i\tan}{a^3\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-i\right)^7}}{280\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/280*(35/(a^3*(tan(1/2*d*x + 1/2*c) + I)) + (525*tan(1/2*d*x + 1/2*c)^6 -
1960*I*tan(1/2*d*x + 1/2*c)^5 - 4025*tan(1/2*d*x + 1/2*c)^4 + 4480*I*tan(1/
2*d*x + 1/2*c)^3 + 3143*tan(1/2*d*x + 1/2*c)^2 - 1176*I*tan(1/2*d*x + 1/2*c
) - 243)/(a^3*(tan(1/2*d*x + 1/2*c) - I)^7))/d
```

maple [A] time = 0.41, size = 141, normalized size = 1.40

$$\frac{\frac{2}{16\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+16i} + \frac{4i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^6} - \frac{9i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^4} + \frac{17i}{4\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^2} - \frac{8}{7\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^7} + \frac{38}{5\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^5} - \frac{15}{2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^3}}{d\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 2/d/a^3*(1/16/(tan(1/2*d*x+1/2*c)+I)+2*I/(tan(1/2*d*x+1/2*c)-I)^6-9/2*I/(ta
n(1/2*d*x+1/2*c)-I)^4+17/8*I/(tan(1/2*d*x+1/2*c)-I)^2-4/7/(tan(1/2*d*x+1/2*
c)-I)^7+19/5/(tan(1/2*d*x+1/2*c)-I)^5-15/4/(tan(1/2*d*x+1/2*c)-I)^3+15/16/(
tan(1/2*d*x+1/2*c)-I))
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 5.90, size = 134, normalized size = 1.33

$$-\frac{\left(35\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6 105\mathrm{i}-175\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4 105\mathrm{i}-7\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3+\tan\left(\frac{c}{2}\right.\right.}{35\,a^3\,d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+1\mathrm{i}\right)\,\left(1+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,1\mathrm{i}\right)^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)/(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] -((43*tan(c/2 + (d*x)/2) + tan(c/2 + (d*x)/2)^2*77i - 7*tan(c/2 + (d*x)/2)^
3 + tan(c/2 + (d*x)/2)^4*105i - 175*tan(c/2 + (d*x)/2)^5 - tan(c/2 + (d*x)/
2)^6*105i + 35*tan(c/2 + (d*x)/2)^7 - 13i)*2i)/(35*a^3*d*(tan(c/2 + (d*x)/2
) + 1i)*(tan(c/2 + (d*x)/2)*1i + 1)^7)
```

sympy [A] time = 0.52, size = 201, normalized size = 1.99

$$\begin{cases} -\frac{\left(71680ia^{12}d^4e^{17ic}e^{idx}-286720ia^{12}d^4e^{15ic}e^{-idx}-143360ia^{12}d^4e^{13ic}e^{-3idx}-57344ia^{12}d^4e^{11ic}e^{-5idx}-10240ia^{12}d^4e^{9ic}e^{-7idx}\right)e^{-16ic}}{1146880a^{15}d^5} & \text{for } 114688 \\ \frac{x\left(e^{8ic}+4e^{6ic}+6e^{4ic}+4e^{2ic}+1\right)e^{-7ic}}{16a^3} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] Piecewise((-(71680*I*a**12*d**4*exp(17*I*c)*exp(I*d*x) - 286720*I*a**12*d**
4*exp(15*I*c)*exp(-I*d*x) - 143360*I*a**12*d**4*exp(13*I*c)*exp(-3*I*d*x) -
 57344*I*a**12*d**4*exp(11*I*c)*exp(-5*I*d*x) - 10240*I*a**12*d**4*exp(9*I*
c)*exp(-7*I*d*x))*exp(-16*I*c)/(1146880*a**15*d**5), Ne(1146880*a**15*d**5*
exp(16*I*c), 0)), (x*(exp(8*I*c) + 4*exp(6*I*c) + 6*exp(4*I*c) + 4*exp(2*I*
c) + 1)*exp(-7*I*c)/(16*a**3), True))
```

3.146 $\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=121

$$\frac{2\sin^5(c+dx)}{21a^3d}-\frac{20\sin^3(c+dx)}{63a^3d}+\frac{10\sin(c+dx)}{21a^3d}+\frac{4i\cos^5(c+dx)}{21d\left(a^3+ia^3\tan(c+dx)\right)}+\frac{i\cos^3(c+dx)}{9d(a+ia\tan(c+dx))^3}$$

```
[Out] 10/21*sin(d*x+c)/a^3/d-20/63*sin(d*x+c)^3/a^3/d+2/21*sin(d*x+c)^5/a^3/d+1/9
*I*cos(d*x+c)^3/d/(a+I*a*tan(d*x+c))^3+4/21*I*cos(d*x+c)^5/d/(a^3+I*a^3*tan
(d*x+c))
```

Rubi [A] time = 0.11, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3502, 3500, 2633}

$$\frac{2\sin^5(c+dx)}{21a^3d}-\frac{20\sin^3(c+dx)}{63a^3d}+\frac{10\sin(c+dx)}{21a^3d}+\frac{4i\cos^5(c+dx)}{21d\left(a^3+ia^3\tan(c+dx)\right)}+\frac{i\cos^3(c+dx)}{9d(a+ia\tan(c+dx))^3}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (10*Sin[c + d*x])/(21*a^3*d) - (20*Sin[c + d*x]^3)/(63*a^3*d) + (2*Sin[c +
d*x]^5)/(21*a^3*d) + ((I/9)*Cos[c + d*x]^3)/(d*(a + I*a*Tan[c + d*x])^3) +
(((4*I)/21)*Cos[c + d*x]^5)/(d*(a^3 + I*a^3*Tan[c + d*x]))
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3502

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

Rubi steps

$$\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx))^3}\,dx = \frac{i\cos^3(c+dx)}{9d(a+ia\tan(c+dx))^3} + \frac{2\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx))^2}\,dx}{3a}$$
$$= \frac{i\cos^3(c+dx)}{9d(a+ia\tan(c+dx))^3} + \frac{4i\cos^5(c+dx)}{21d\left(a^3+ia^3\tan(c+dx)\right)} + \frac{10\int \cos^5(c+dx)\,dx}{21a^3}$$
$$= \frac{i\cos^3(c+dx)}{9d(a+ia\tan(c+dx))^3} + \frac{4i\cos^5(c+dx)}{21d\left(a^3+ia^3\tan(c+dx)\right)} - \frac{10\,\text{Subst}\left(\int \left(1-2x^2+x\right.\right.}{21a^3}$$
$$= \frac{10\sin(c+dx)}{21a^3d} - \frac{20\sin^3(c+dx)}{63a^3d} + \frac{2\sin^5(c+dx)}{21a^3d} + \frac{i\cos^3(c+dx)}{9d(a+ia\tan(c+dx))^3} + \frac{}{2}$$

Mathematica [A] time = 0.30, size = 98, normalized size = 0.81

$$\frac{\sec^3(c+dx)(-378i\sin(2(c+dx))+216i\sin(4(c+dx))+14i\sin(6(c+dx))-567\cos(2(c+dx))+162\cos(4(}{2016a^3d(\tan(c+dx)-i)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (Sec[c + d*x]^3*(-210 - 567*Cos[2*(c + d*x)] + 162*Cos[4*(c + d*x)] + 7*Cos
[6*(c + d*x)] - (378*I)*Sin[2*(c + d*x)] + (216*I)*Sin[4*(c + d*x)] + (14*I
)*Sin[6*(c + d*x)]))/(2016*a^3*d*(-I + Tan[c + d*x])^3)
```

fricas [A] time = 0.66, size = 85, normalized size = 0.70

$$\frac{\left(-21i\,e^{(12i\,dx+12i\,c)} - 378i\,e^{(10i\,dx+10i\,c)} + 945i\,e^{(8i\,dx+8i\,c)} + 420i\,e^{(6i\,dx+6i\,c)} + 189i\,e^{(4i\,dx+4i\,c)} + 54i\,e^{(2i\,dx+2i\,c)} + 7i\right)e}{4032\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/4032*(-21*I*e^(12*I*d*x + 12*I*c) - 378*I*e^(10*I*d*x + 10*I*c) + 945*I*e
^(8*I*d*x + 8*I*c) + 420*I*e^(6*I*d*x + 6*I*c) + 189*I*e^(4*I*d*x + 4*I*c)
+ 54*I*e^(2*I*d*x + 2*I*c) + 7*I)*e^(-9*I*d*x - 9*I*c)/(a^3*d)
```

giac [A] time = 1.66, size = 171, normalized size = 1.41

$$\frac{\frac{21\left(21\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2+36i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-19\right)}{a^3\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+i\right)^3} + \frac{3591\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^8-19656i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^7-56196\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^6+95760i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right.}{a^3(\mathrm{t}}}{2016\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/2016*(21*(21*tan(1/2*d*x + 1/2*c)^2 + 36*I*tan(1/2*d*x + 1/2*c) - 19)/(a^
3*(tan(1/2*d*x + 1/2*c) + I)^3) + (3591*tan(1/2*d*x + 1/2*c)^8 - 19656*I*ta
n(1/2*d*x + 1/2*c)^7 - 56196*tan(1/2*d*x + 1/2*c)^6 + 95760*I*tan(1/2*d*x +
 1/2*c)^5 + 107730*tan(1/2*d*x + 1/2*c)^4 - 79464*I*tan(1/2*d*x + 1/2*c)^3
- 38484*tan(1/2*d*x + 1/2*c)^2 + 10944*I*tan(1/2*d*x + 1/2*c) + 1615)/(a^3*
(tan(1/2*d*x + 1/2*c) - I)^9))/d
```

maple [A] time = 0.43, size = 207, normalized size = 1.71

$$\frac{-\frac{i}{16\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^2} - \frac{1}{24\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^3} + \frac{7}{32\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)} + \frac{46i}{3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^6} - \frac{4i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^8} + \frac{9i}{2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^2} - \frac{5}{4\left(\tan\left(\frac{d}{2}\right.\right.}}{d\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 2/d/a^3*(-1/32*I/(tan(1/2*d*x+1/2*c)+I)^2-1/48/(tan(1/2*d*x+1/2*c)+I)^3+7/6
4/(tan(1/2*d*x+1/2*c)+I)+23/3*I/(tan(1/2*d*x+1/2*c)-I)^6-2*I/(tan(1/2*d*x+1
/2*c)-I)^8+9/4*I/(tan(1/2*d*x+1/2*c)-I)^2-59/8*I/(tan(1/2*d*x+1/2*c)-I)^4+4
/9/(tan(1/2*d*x+1/2*c)-I)^9-34/7/(tan(1/2*d*x+1/2*c)-I)^7+35/4/(tan(1/2*d*x
+1/2*c)-I)^5-19/4/(tan(1/2*d*x+1/2*c)-I)^3+57/64/(tan(1/2*d*x+1/2*c)-I))
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 6.61, size = 188, normalized size = 1.55

$$\frac{\left(63\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{11}-\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{10}189i-273\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{9}-\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{8}63i-378\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{7}+\tan\left(\frac{c}{2}\right.\right.}{63\,a^3\,d\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3/(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] ((51*tan(c/2 + (d*x)/2) + tan(c/2 + (d*x)/2)^2*39i + 235*tan(c/2 + (d*x)/2)
^3 + tan(c/2 + (d*x)/2)^4*450i - 306*tan(c/2 + (d*x)/2)^5 + tan(c/2 + (d*x)
/2)^6*294i - 378*tan(c/2 + (d*x)/2)^7 - tan(c/2 + (d*x)/2)^8*63i - 273*tan(
c/2 + (d*x)/2)^9 - tan(c/2 + (d*x)/2)^10*189i + 63*tan(c/2 + (d*x)/2)^11 -
19i)*2i)/(63*a^3*d*(tan(c/2 + (d*x)/2) + 1i)^3*(tan(c/2 + (d*x)/2)*1i + 1)^
9)
```

sympy [A] time = 0.69, size = 269, normalized size = 2.22

$$\begin{cases} -\frac{\left(811748818944ia^{18}d^{6}e^{28ic}e^{3idx}+14611478740992ia^{18}d^{6}e^{26ic}e^{idx}-36528696852480ia^{18}d^{6}e^{24ic}e^{-idx}-16234976378880ia^{18}d^{6}e^{22ic}e^{-3idx}-7305739370\right.}{155855773237248a^{21}d^{7}} \\ \frac{x\left(e^{12ic}+6e^{10ic}+15e^{8ic}+20e^{6ic}+15e^{4ic}+6e^{2ic}+1\right)e^{-9ic}}{64a^3} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] Piecewise((-(811748818944*I*a**18*d**6*exp(28*I*c)*exp(3*I*d*x) + 146114787
40992*I*a**18*d**6*exp(26*I*c)*exp(I*d*x) - 36528696852480*I*a**18*d**6*exp
(24*I*c)*exp(-I*d*x) - 16234976378880*I*a**18*d**6*exp(22*I*c)*exp(-3*I*d*x
) - 7305739370496*I*a**18*d**6*exp(20*I*c)*exp(-5*I*d*x) - 2087354105856*I*
a**18*d**6*exp(18*I*c)*exp(-7*I*d*x) - 270582939648*I*a**18*d**6*exp(16*I*c
)*exp(-9*I*d*x))*exp(-25*I*c)/(155855773237248*a**21*d**7), Ne(155855773237
248*a**21*d**7*exp(25*I*c), 0)), (x*(exp(12*I*c) + 6*exp(10*I*c) + 15*exp(8
*I*c) + 20*exp(6*I*c) + 15*exp(4*I*c) + 6*exp(2*I*c) + 1)*exp(-9*I*c)/(64*a
**3), True))
```

3.147 $\int \frac{\cos^5(c+dx)}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=139

$$-\frac{8\sin^7(c+dx)}{99a^3d}+\frac{56\sin^5(c+dx)}{165a^3d}-\frac{56\sin^3(c+dx)}{99a^3d}+\frac{56\sin(c+dx)}{99a^3d}+\frac{16i\cos^7(c+dx)}{99d\left(a^3+ia^3\tan(c+dx)\right)}+\frac{i\cos^5(c}{11d(a+ia\tan}$$

```
[Out] 56/99*sin(d*x+c)/a^3/d-56/99*sin(d*x+c)^3/a^3/d+56/165*sin(d*x+c)^5/a^3/d-8
/99*sin(d*x+c)^7/a^3/d+1/11*I*cos(d*x+c)^5/d/(a+I*a*tan(d*x+c))^3+16/99*I*c
os(d*x+c)^7/d/(a^3+I*a^3*tan(d*x+c))
```

Rubi [A] time = 0.12, antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3502, 3500, 2633}

$$-\frac{8\sin^7(c+dx)}{99a^3d}+\frac{56\sin^5(c+dx)}{165a^3d}-\frac{56\sin^3(c+dx)}{99a^3d}+\frac{56\sin(c+dx)}{99a^3d}+\frac{16i\cos^7(c+dx)}{99d\left(a^3+ia^3\tan(c+dx)\right)}+\frac{i\cos^5(c}{11d(a+ia\tan}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^5/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (56*Sin[c + d*x])/(99*a^3*d) - (56*Sin[c + d*x]^3)/(99*a^3*d) + (56*Sin[c +
 d*x]^5)/(165*a^3*d) - (8*Sin[c + d*x]^7)/(99*a^3*d) + ((I/11)*Cos[c + d*x]
^5)/(d*(a + I*a*Tan[c + d*x])^3) + (((16*I)/99)*Cos[c + d*x]^7)/(d*(a^3 + I
*a^3*Tan[c + d*x]))
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3502

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

Rubi steps

$$\int \frac{\cos^5(c+dx)}{(a+ia\tan(c+dx))^3}\,dx = \frac{i\cos^5(c+dx)}{11d(a+ia\tan(c+dx))^3} + \frac{8\int \frac{\cos^5(c+dx)}{(a+ia\tan(c+dx))^2}\,dx}{11a}$$
$$= \frac{i\cos^5(c+dx)}{11d(a+ia\tan(c+dx))^3} + \frac{16i\cos^7(c+dx)}{99d\left(a^3+ia^3\tan(c+dx)\right)} + \frac{56\int \cos^7(c+dx)\,dx}{99a^3}$$
$$= \frac{i\cos^5(c+dx)}{11d(a+ia\tan(c+dx))^3} + \frac{16i\cos^7(c+dx)}{99d\left(a^3+ia^3\tan(c+dx)\right)} - \frac{56\,\text{Subst}\left(\int \left(1-3x^2+3x^4\right.\right.}{99}$$
$$= \frac{56\sin(c+dx)}{99a^3d} - \frac{56\sin^3(c+dx)}{99a^3d} + \frac{56\sin^5(c+dx)}{165a^3d} - \frac{8\sin^7(c+dx)}{99a^3d} + \frac{i\cos^5(}{11d(a+ia\,\text{ta}}$$

Mathematica [A] time = 0.71, size = 120, normalized size = 0.86

$$\frac{\sec^3(c+dx)(-11088i\sin(2(c+dx))+7920i\sin(4(c+dx))+880i\sin(6(c+dx))+72i\sin(8(c+dx))-16632\,\text{co}}{63360a^3d(\tan(c+dx)-i)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^5/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (Sec[c + d*x]^3*(-5775 - 16632*Cos[2*(c + d*x)] + 5940*Cos[4*(c + d*x)] + 4
40*Cos[6*(c + d*x)] + 27*Cos[8*(c + d*x)] - (11088*I)*Sin[2*(c + d*x)] + (7
920*I)*Sin[4*(c + d*x)] + (880*I)*Sin[6*(c + d*x)] + (72*I)*Sin[8*(c + d*x)
]))/(63360*a^3*d*(-I + Tan[c + d*x])^3)
```

fricas [A] time = 0.42, size = 107, normalized size = 0.77

$$\frac{\left(-99i\,e^{(16i\,dx+16i\,c)} - 1320i\,e^{(14i\,dx+14i\,c)} - 13860i\,e^{(12i\,dx+12i\,c)} + 27720i\,e^{(10i\,dx+10i\,c)} + 11550i\,e^{(8i\,dx+8i\,c)} + 5544i\,e^{(6i\,d}\right.}{126720\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/126720*(-99*I*e^(16*I*d*x + 16*I*c) - 1320*I*e^(14*I*d*x + 14*I*c) - 1386
0*I*e^(12*I*d*x + 12*I*c) + 27720*I*e^(10*I*d*x + 10*I*c) + 11550*I*e^(8*I*
d*x + 8*I*c) + 5544*I*e^(6*I*d*x + 6*I*c) + 1980*I*e^(4*I*d*x + 4*I*c) + 44
0*I*e^(2*I*d*x + 2*I*c) + 45*I)*e^(-11*I*d*x - 11*I*c)/(a^3*d)
```

giac [A] time = 1.74, size = 223, normalized size = 1.60

$$\frac{33\left(555\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^4+1920i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-2710\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1760i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+463\right)}{a^3\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+i\right)^5} + \frac{108405\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^{10}-784080i\tan\left(\frac{1}{2}dx+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/63360*(33*(555*tan(1/2*d*x + 1/2*c)^4 + 1920*I*tan(1/2*d*x + 1/2*c)^3 - 2
710*tan(1/2*d*x + 1/2*c)^2 - 1760*I*tan(1/2*d*x + 1/2*c) + 463)/(a^3*(tan(1
/2*d*x + 1/2*c) + I)^5) + (108405*tan(1/2*d*x + 1/2*c)^10 - 784080*I*tan(1/
2*d*x + 1/2*c)^9 - 2901195*tan(1/2*d*x + 1/2*c)^8 + 6652800*I*tan(1/2*d*x +
 1/2*c)^7 + 10407474*tan(1/2*d*x + 1/2*c)^6 - 11435424*I*tan(1/2*d*x + 1/2*
c)^5 - 8949270*tan(1/2*d*x + 1/2*c)^4 + 4899840*I*tan(1/2*d*x + 1/2*c)^3 +
```

```
1816265*tan(1/2*d*x + 1/2*c)^2 - 411664*I*tan(1/2*d*x + 1/2*c) - 47279)/(a^
3*(tan(1/2*d*x + 1/2*c) - I)^11))/d
```

maple [B] time = 0.42, size = 273, normalized size = 1.96

$$-\frac{23i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{8}}+\frac{4i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{10}}+\frac{1}{40\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^{5}}-\frac{7}{48\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^{3}}+\frac{37}{128\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)}+\frac{217i}{6\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{6}}+\frac{}{64\left(\tan\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^5/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 2/d/a^3*(-23/2*I/(tan(1/2*d*x+1/2*c)-I)^8+2*I/(tan(1/2*d*x+1/2*c)-I)^10+1/8
0/(tan(1/2*d*x+1/2*c)+I)^5-7/96/(tan(1/2*d*x+1/2*c)+I)^3+37/256/(tan(1/2*d*
x+1/2*c)+I)+217/12*I/(tan(1/2*d*x+1/2*c)-I)^6+303/128*I/(tan(1/2*d*x+1/2*c)
-I)^2-5/64*I/(tan(1/2*d*x+1/2*c)+I)^2+1/32*I/(tan(1/2*d*x+1/2*c)+I)^4-169/1
6*I/(tan(1/2*d*x+1/2*c)-I)^4-4/11/(tan(1/2*d*x+1/2*c)-I)^11+53/9/(tan(1/2*d
*x+1/2*c)-I)^9-33/2/(tan(1/2*d*x+1/2*c)-I)^7+623/40/(tan(1/2*d*x+1/2*c)-I)^
5-365/64/(tan(1/2*d*x+1/2*c)-I)^3+219/256/(tan(1/2*d*x+1/2*c)-I))
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 5.52, size = 136, normalized size = 0.98

$$\frac{\left(\frac{\cos(7\,c+7\,d\,x)}{64}+\frac{\cos(9\,c+9\,d\,x)}{288}+\frac{\cos(11\,c+11\,d\,x)}{2816}-\frac{\sin(7\,c+7\,d\,x)\,1\mathrm{i}}{64}-\frac{\sin(9\,c+9\,d\,x)\,1\mathrm{i}}{288}-\frac{\sin(11\,c+11\,d\,x)\,1\mathrm{i}}{2816}+\frac{\sqrt{224}\,\cos\left(5\,c+5\,d\,x+\mathrm{atan}\right.}{1280}\right.}{a^3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^5/(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] ((cos(7*c + 7*d*x)/64 + cos(9*c + 9*d*x)/288 + cos(11*c + 11*d*x)/2816 - (s
in(7*c + 7*d*x)*1i)/64 - (sin(9*c + 9*d*x)*1i)/288 - (sin(11*c + 11*d*x)*1i
)/2816 + (224^(1/2)*cos(5*c + atanh(57/55)*1i + 5*d*x)*1i)/1280 + (560^(1/2
)*cos(3*c + atanh(39/31)*1i + 3*d*x)*1i)/384 + (2^(1/2)*cos(c + atanh(3)*1i
 + d*x)*7i)/32)*1i)/(a^3*d)
```

sympy [A] time = 0.88, size = 337, normalized size = 2.42

$$\begin{cases} -\frac{\left(626985510622986240ia^{24}d^{8}e^{41ic}e^{5idx}+835980680830648320 0ia^{24}d^{8}e^{39ic}e^{3idx}+877779714872180736 00ia^{24}d^{8}e^{37ic}e^{idx}-1755559429744361472\right.}{} \\ \frac{x\left(e^{16ic}+8e^{14ic}+28e^{12ic}+56e^{10ic}+70e^{8ic}+56e^{6ic}+28e^{4ic}+8e^{2ic}+1\right)e^{-11ic}}{256a^{3}} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**5/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] Piecewise((-(626985510622986240*I*a**24*d**8*exp(41*I*c)*exp(5*I*d*x) + 835
9806808306483200*I*a**24*d**8*exp(39*I*c)*exp(3*I*d*x) + 877779714872180736
```

```
00*I*a**24*d**8*exp(37*I*c)*exp(I*d*x) - 1755559429744361472OO*I*a**24*d**8
*exp(35*I*c)*exp(-I*d*x) - 731483095726817280OO*I*a**24*d**8*exp(33*I*c)*ex
p(-3*I*d*x) - 351111885948872294 40*I*a**24*d**8*exp(31*I*c)*exp(-5*I*d*x) -
 125397102124597248OO*I*a**24*d**8*exp(29*I*c)*exp(-7*I*d*x) - 278660226943
5494400*I*a**24*d**8*exp(27*I*c)*exp(-9*I*d*x) - 284993413919539200*I*a**24
*d**8*exp(25*I*c)*exp(-11*I*d*x))*exp(-36*I*c)/(8025414535974223872OO*a**27
*d**9), Ne(8025414535974223872OO*a**27*d**9*exp(36*I*c), 0)), (x*(exp(16*I*
c) + 8*exp(14*I*c) + 28*exp(12*I*c) + 56*exp(10*I*c) + 70*exp(8*I*c) + 56*e
xp(6*I*c) + 28*exp(4*I*c) + 8*exp(2*I*c) + 1)*exp(-11*I*c)/(256*a**3), True
))
```

3.148 $\int \frac{\sec^{14}(c+dx)}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=82

$$\frac{i(a-ia\tan(c+dx))^9}{9a^{13}d}-\frac{i(a-ia\tan(c+dx))^8}{2a^{12}d}+\frac{4i(a-ia\tan(c+dx))^7}{7a^{11}d}$$

```
[Out] 4/7*I*(a-I*a*tan(d*x+c))^7/a^11/d-1/2*I*(a-I*a*tan(d*x+c))^8/a^12/d+1/9*I*(
a-I*a*tan(d*x+c))^9/a^13/d
```

Rubi [A] time = 0.06, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{i(a-ia\tan(c+dx))^9}{9a^{13}d}-\frac{i(a-ia\tan(c+dx))^8}{2a^{12}d}+\frac{4i(a-ia\tan(c+dx))^7}{7a^{11}d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^14/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (((4*I)/7)*(a - I*a*Tan[c + d*x])^7)/(a^11*d) - ((I/2)*(a - I*a*Tan[c + d*x
])^8)/(a^12*d) + ((I/9)*(a - I*a*Tan[c + d*x])^9)/(a^13*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^{14}(c+dx)}{(a+ia\tan(c+dx))^4}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^6(a+x)^2\,dx, x, ia\tan(c+dx)\right)}{a^{13}d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(4a^2(a-x)^6-4a(a-x)^7+(a-x)^8\right)dx, x, ia\tan(c+dx)\right)}{a^{13}d}\\ &= \frac{4i(a-ia\tan(c+dx))^7}{7a^{11}d}-\frac{i(a-ia\tan(c+dx))^8}{2a^{12}d}+\frac{i(a-ia\tan(c+dx))^9}{9a^{13}d}\end{aligned}$$

Mathematica [A] time = 0.79, size = 136, normalized size = 1.66

$$\frac{\sec(c)\sec^9(c+dx)(-63\sin(2c+dx)+42\sin(2c+3dx)-42\sin(4c+3dx)+36\sin(4c+5dx)+9\sin(6c+7}{252a}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^14/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (Sec[c]*Sec[c + d*x]^9*((-63*I)*Cos[d*x] - (63*I)*Cos[2*c + d*x] - (42*I)*C
os[2*c + 3*d*x] - (42*I)*Cos[4*c + 3*d*x] + 63*Sin[d*x] - 63*Sin[2*c + d*x]
 + 42*Sin[2*c + 3*d*x] - 42*Sin[4*c + 3*d*x] + 36*Sin[4*c + 5*d*x] + 9*Sin[
6*c + 7*d*x] + Sin[8*c + 9*d*x]))/(252*a^4*d)
```

fricas [B] time = 0.54, size = 168, normalized size = 2.05

$$\frac{4608i\,e^{(4i\,dx+4i\,c)}+1152i\,e^{(2i\,dx+2i\,c)}+128i}{63\left(a^4de^{(18i\,dx+18i\,c)}+9\,a^4de^{(16i\,dx+16i\,c)}+36\,a^4de^{(14i\,dx+14i\,c)}+84\,a^4de^{(12i\,dx+12i\,c)}+126\,a^4de^{(10i\,dx+10i\,c)}+126\,a^4de^{(8$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^14/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/63*(4608*I*e^(4*I*d*x + 4*I*c) + 1152*I*e^(2*I*d*x + 2*I*c) + 128*I)/(a^4
*d*e^(18*I*d*x + 18*I*c) + 9*a^4*d*e^(16*I*d*x + 16*I*c) + 36*a^4*d*e^(14*I
*d*x + 14*I*c) + 84*a^4*d*e^(12*I*d*x + 12*I*c) + 126*a^4*d*e^(10*I*d*x + 1
0*I*c) + 126*a^4*d*e^(8*I*d*x + 8*I*c) + 84*a^4*d*e^(6*I*d*x + 6*I*c) + 36*
a^4*d*e^(4*I*d*x + 4*I*c) + 9*a^4*d*e^(2*I*d*x + 2*I*c) + a^4*d)
```

giac [A] time = 3.64, size = 97, normalized size = 1.18

$$\frac{14\,\tan\left(dx+c\right)^9+63i\,\tan\left(dx+c\right)^8-72\,\tan\left(dx+c\right)^7+84i\,\tan\left(dx+c\right)^6-252\,\tan\left(dx+c\right)^5-126i\,\tan\left(dx+c\right.}{126\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^14/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/126*(14*tan(d*x + c)^9 + 63*I*tan(d*x + c)^8 - 72*tan(d*x + c)^7 + 84*I*t
an(d*x + c)^6 - 252*tan(d*x + c)^5 - 126*I*tan(d*x + c)^4 - 168*tan(d*x + c
)^3 - 252*I*tan(d*x + c)^2 + 126*tan(d*x + c))/(a^4*d)
```

maple [A] time = 0.42, size = 99, normalized size = 1.21

$$\frac{\tan\left(dx+c\right)+\frac{\left(\tan^9(dx+c)\right)}{9}+\frac{i\left(\tan^8(dx+c)\right)}{2}-\frac{4\left(\tan^7(dx+c)\right)}{7}+\frac{2i\left(\tan^6(dx+c)\right)}{3}-2\left(\tan^5\left(dx+c\right)\right)-i\left(\tan^4\left(dx+c\right)\right)-\frac{4\left(\tan^3\right.}{}}{d\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^14/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 1/d/a^4*(tan(d*x+c)+1/9*tan(d*x+c)^9+1/2*I*tan(d*x+c)^8-4/7*tan(d*x+c)^7+2/
3*I*tan(d*x+c)^6-2*tan(d*x+c)^5-I*tan(d*x+c)^4-4/3*tan(d*x+c)^3-2*I*tan(d*x
+c)^2)
```

maxima [A] time = 0.39, size = 97, normalized size = 1.18

$$\frac{14\,\tan\left(dx+c\right)^9+63i\,\tan\left(dx+c\right)^8-72\,\tan\left(dx+c\right)^7+84i\,\tan\left(dx+c\right)^6-252\,\tan\left(dx+c\right)^5-126i\,\tan\left(dx+c\right.}{126\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^14/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] 1/126*(14*tan(d*x + c)^9 + 63*I*tan(d*x + c)^8 - 72*tan(d*x + c)^7 + 84*I*t
an(d*x + c)^6 - 252*tan(d*x + c)^5 - 126*I*tan(d*x + c)^4 - 168*tan(d*x + c
)^3 - 252*I*tan(d*x + c)^2 + 126*tan(d*x + c))/(a^4*d)
```

mupad [B] time = 3.52, size = 120, normalized size = 1.46

$$\frac{\cos\left(c+d\,x\right)^9\,105\mathrm{i}+128\,\sin\left(c+d\,x\right)\,\cos\left(c+d\,x\right)^8+64\,\sin\left(c+d\,x\right)\,\cos\left(c+d\,x\right)^6+48\,\sin\left(c+d\,x\right)\,\cos\left(c+d\right.}{126\,a^4\,d\,\cos\left(c+d\,x\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^14*(a + a*tan(c + d*x)*1i)^4),x)
```

```
[Out] (cos(c + d*x)*63i + 14*sin(c + d*x) - 128*cos(c + d*x)^2*sin(c + d*x) + 48*
cos(c + d*x)^4*sin(c + d*x) + 64*cos(c + d*x)^6*sin(c + d*x) + 128*cos(c +
d*x)^8*sin(c + d*x) - cos(c + d*x)^3*168i + cos(c + d*x)^9*105i)/(126*a^4*d
*cos(c + d*x)^9)
```

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

$$\frac{\int \frac{\sec^{14}(c+dx)}{\tan^4(c+dx)-4i\tan^3(c+dx)-6\tan^2(c+dx)+4i\tan(c+dx)+1}\,dx}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**14/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Integral(sec(c + d*x)**14/(tan(c + d*x)**4 - 4*I*tan(c + d*x)**3 - 6*tan(c
+ d*x)**2 + 4*I*tan(c + d*x) + 1), x)/a**4
```

3.149 $\int \frac{\sec^{12}(c+dx)}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=55

$$\frac{i(a-ia\tan(c+dx))^6}{3a^{10}d}-\frac{i(a-ia\tan(c+dx))^7}{7a^{11}d}$$

```
[Out] 1/3*I*(a-I*a*tan(d*x+c))^6/a^10/d-1/7*I*(a-I*a*tan(d*x+c))^7/a^11/d
```

Rubi [A] time = 0.05, antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {3487, 43}

$$\frac{i(a-ia\tan(c+dx))^6}{3a^{10}d}-\frac{i(a-ia\tan(c+dx))^7}{7a^{11}d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^12/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] ((I/3)*(a - I*a*Tan[c + d*x])^6)/(a^10*d) - ((I/7)*(a - I*a*Tan[c + d*x])^7
)/(a^11*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sec^{12}(c+dx)}{(a+ia\tan(c+dx))^4}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^5(a+x)\,dx,x,ia\tan(c+dx)\right)}{a^{11}d}\\
&= -\frac{i\,\text{Subst}\left(\int \left(2a(a-x)^5-(a-x)^6\right)\,dx,x,ia\tan(c+dx)\right)}{a^{11}d}\\
&= \frac{i(a-ia\tan(c+dx))^6}{3a^{10}d}-\frac{i(a-ia\tan(c+dx))^7}{7a^{11}d}
\end{aligned}$$

Mathematica [B] time = 0.53, size = 127, normalized size = 2.31

$$\frac{\sec(c)\sec^7(c+dx)(-35\sin(2c+dx)+21\sin(2c+3dx)-21\sin(4c+3dx)+14\sin(4c+5dx)+2\sin(6c+7dx)}{84a^4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^12/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (Sec[c]*Sec[c + d*x]^7*((-35*I)*Cos[d*x] - (35*I)*Cos[2*c + d*x] - (21*I)*C
os[2*c + 3*d*x] - (21*I)*Cos[4*c + 3*d*x] + 35*Sin[d*x] - 35*Sin[2*c + d*x]
```

```
 + 21*Sin[2*c + 3*d*x] - 21*Sin[4*c + 3*d*x] + 14*Sin[4*c + 5*d*x] + 2*Sin[
6*c + 7*d*x]))/(84*a^4*d)
```

fricas [B] time = 0.66, size = 127, normalized size = 2.31

$$\frac{448i\,e^{(2i\,dx+2i\,c)} + 64i}{21\left(a^4de^{(14i\,dx+14i\,c)} + 7\,a^4de^{(12i\,dx+12i\,c)} + 21\,a^4de^{(10i\,dx+10i\,c)} + 35\,a^4de^{(8i\,dx+8i\,c)} + 35\,a^4de^{(6i\,dx+6i\,c)} + 21\,a^4de^{(4i\,dx}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^12/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/21*(448*I*e^(2*I*d*x + 2*I*c) + 64*I)/(a^4*d*e^(14*I*d*x + 14*I*c) + 7*a^
4*d*e^(12*I*d*x + 12*I*c) + 21*a^4*d*e^(10*I*d*x + 10*I*c) + 35*a^4*d*e^(8*
I*d*x + 8*I*c) + 35*a^4*d*e^(6*I*d*x + 6*I*c) + 21*a^4*d*e^(4*I*d*x + 4*I*c
) + 7*a^4*d*e^(2*I*d*x + 2*I*c) + a^4*d)
```

giac [A] time = 1.97, size = 67, normalized size = 1.22

$$\frac{3\,\tan\left(dx+c\right)^7 + 14i\,\tan\left(dx+c\right)^6 - 21\,\tan\left(dx+c\right)^5 - 35\,\tan\left(dx+c\right)^3 - 42i\,\tan\left(dx+c\right)^2 + 21\,\tan\left(dx+c\right)}{21\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^12/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/21*(3*tan(d*x + c)^7 + 14*I*tan(d*x + c)^6 - 21*tan(d*x + c)^5 - 35*tan(d
*x + c)^3 - 42*I*tan(d*x + c)^2 + 21*tan(d*x + c))/(a^4*d)
```

maple [A] time = 0.39, size = 67, normalized size = 1.22

$$\frac{\tan\left(dx+c\right) + \frac{\left(\tan^7(dx+c)\right)}{7} + \frac{2i\left(\tan^6(dx+c)\right)}{3} - \left(\tan^5\left(dx+c\right)\right) - \frac{5\left(\tan^3(dx+c)\right)}{3} - 2i\left(\tan^2\left(dx+c\right)\right)}{d\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^12/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 1/d/a^4*(tan(d*x+c)+1/7*tan(d*x+c)^7+2/3*I*tan(d*x+c)^6-tan(d*x+c)^5-5/3*ta
n(d*x+c)^3-2*I*tan(d*x+c)^2)
```

maxima [A] time = 0.52, size = 67, normalized size = 1.22

$$\frac{3\,\tan\left(dx+c\right)^7 + 14i\,\tan\left(dx+c\right)^6 - 21\,\tan\left(dx+c\right)^5 - 35\,\tan\left(dx+c\right)^3 - 42i\,\tan\left(dx+c\right)^2 + 21\,\tan\left(dx+c\right)}{21\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^12/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] 1/21*(3*tan(d*x + c)^7 + 14*I*tan(d*x + c)^6 - 21*tan(d*x + c)^5 - 35*tan(d
*x + c)^3 - 42*I*tan(d*x + c)^2 + 21*tan(d*x + c))/(a^4*d)
```

mupad [B] time = 3.34, size = 113, normalized size = 2.05

$$\frac{\sin\left(c+d\,x\right)\,\left(21\cos\left(c+d\,x\right)^6 - \cos\left(c+d\,x\right)^5\,\sin\left(c+d\,x\right)\,42\mathrm{i} - 35\cos\left(c+d\,x\right)^4\sin\left(c+d\,x\right)^2 - 21\cos\left(c+\right.\right.}{21\,a^4\,d\cos\left(c+d\,x\right)^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^12*(a + a*tan(c + d*x)*1i)^4),x)
```

```
[Out] (sin(c + d*x)*(cos(c + d*x)*sin(c + d*x)^5*14i - cos(c + d*x)^5*sin(c + d*x
)*42i + 21*cos(c + d*x)^6 + 3*sin(c + d*x)^6 - 21*cos(c + d*x)^2*sin(c + d*
x)^4 - 35*cos(c + d*x)^4*sin(c + d*x)^2))/(21*a^4*d*cos(c + d*x)^7)
```

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

$$\frac{\int \frac{\sec^{12}(c+dx)}{\tan^4(c+dx)-4i\tan^3(c+dx)-6\tan^2(c+dx)+4i\tan(c+dx)+1}\,dx}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**12/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Integral(sec(c + d*x)**12/(tan(c + d*x)**4 - 4*I*tan(c + d*x)**3 - 6*tan(c
+ d*x)**2 + 4*I*tan(c + d*x) + 1), x)/a**4
```

3.150 $\int \frac{\sec^{10}(c+dx)}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=27

$$\frac{i(a-ia\tan(c+dx))^5}{5a^9d}$$

```
[Out] 1/5*I*(a-I*a*tan(d*x+c))^5/a^9/d
```

Rubi [A] time = 0.04, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 32}

$$\frac{i(a-ia\tan(c+dx))^5}{5a^9d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^10/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] ((I/5)*(a - I*a*Tan[c + d*x])^5)/(a^9*d)
```

Rule 32

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^{10}(c+dx)}{(a+ia\tan(c+dx))^4}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^4\,dx, x, ia\tan(c+dx)\right)}{a^9d}\\ &= \frac{i(a-ia\tan(c+dx))^5}{5a^9d}\end{aligned}$$

Mathematica [B] time = 0.45, size = 116, normalized size = 4.30

$$\frac{\sec(c)\sec^5(c+dx)(-10\sin(2c+dx)+5\sin(2c+3dx)-5\sin(4c+3dx)+2\sin(4c+5dx)-10i\cos(2c+dx)}{10a^4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^10/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (Sec[c]*Sec[c + d*x]^5*((-10*I)*Cos[d*x] - (10*I)*Cos[2*c + d*x] - (5*I)*Co
s[2*c + 3*d*x] - (5*I)*Cos[4*c + 3*d*x] + 10*Sin[d*x] - 10*Sin[2*c + d*x] +
 5*Sin[2*c + 3*d*x] - 5*Sin[4*c + 3*d*x] + 2*Sin[4*c + 5*d*x]))/(10*a^4*d)
```

fricas [B] time = 0.60, size = 84, normalized size = 3.11

$$\frac{32i}{5\left(a^4de^{(10i\,dx+10i\,c)}+5\,a^4de^{(8i\,dx+8i\,c)}+10\,a^4de^{(6i\,dx+6i\,c)}+10\,a^4de^{(4i\,dx+4i\,c)}+5\,a^4de^{(2i\,dx+2i\,c)}+a^4d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 32/5*I/(a^4*d*e^(10*I*d*x + 10*I*c) + 5*a^4*d*e^(8*I*d*x + 8*I*c) + 10*a^4*
d*e^(6*I*d*x + 6*I*c) + 10*a^4*d*e^(4*I*d*x + 4*I*c) + 5*a^4*d*e^(2*I*d*x +
 2*I*c) + a^4*d)
```

giac [B] time = 2.16, size = 55, normalized size = 2.04

$$\frac{\tan\left(dx+c\right)^{5}+5i\,\tan\left(dx+c\right)^{4}-10\,\tan\left(dx+c\right)^{3}-10i\,\tan\left(dx+c\right)^{2}+5\,\tan\left(dx+c\right)}{5\,a^{4}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/5*(tan(d*x + c)^5 + 5*I*tan(d*x + c)^4 - 10*tan(d*x + c)^3 - 10*I*tan(d*x
 + c)^2 + 5*tan(d*x + c))/(a^4*d)
```

maple [B] time = 0.38, size = 57, normalized size = 2.11

$$\frac{\tan\left(dx+c\right)+\frac{\left(\tan^{5}(dx+c)\right)}{5}+i\left(\tan^{4}\left(dx+c\right)\right)-2\left(\tan^{3}\left(dx+c\right)\right)-2i\left(\tan^{2}\left(dx+c\right)\right)}{d\,a^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 1/d/a^4*(tan(d*x+c)+1/5*tan(d*x+c)^5+I*tan(d*x+c)^4-2*tan(d*x+c)^3-2*I*tan(
d*x+c)^2)
```

maxima [B] time = 0.37, size = 57, normalized size = 2.11

$$\frac{3\,\tan\left(dx+c\right)^{5}+15i\,\tan\left(dx+c\right)^{4}-30\,\tan\left(dx+c\right)^{3}-30i\,\tan\left(dx+c\right)^{2}+15\,\tan\left(dx+c\right)}{15\,a^{4}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] 1/15*(3*tan(d*x + c)^5 + 15*I*tan(d*x + c)^4 - 30*tan(d*x + c)^3 - 30*I*tan
(d*x + c)^2 + 15*tan(d*x + c))/(a^4*d)
```

mupad [B] time = 3.39, size = 93, normalized size = 3.44

$$\frac{\sin\left(c+d\,x\right)\,\left(5\cos\left(c+d\,x\right)^{4}-\cos\left(c+d\,x\right)^{3}\,\sin\left(c+d\,x\right)\,10\mathrm{i}-10\cos\left(c+d\,x\right)^{2}\sin\left(c+d\,x\right)^{2}+\cos\left(c+d\,x\right)\,\sin}{5\,a^{4}\,d\cos\left(c+d\,x\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^10*(a + a*tan(c + d*x)*1i)^4),x)
```

```
[Out] (sin(c + d*x)*(cos(c + d*x)*sin(c + d*x)^3*5i - cos(c + d*x)^3*sin(c + d*x)
*10i + 5*cos(c + d*x)^4 + sin(c + d*x)^4 - 10*cos(c + d*x)^2*sin(c + d*x)^2
))/(5*a^4*d*cos(c + d*x)^5)
```

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

$$\frac{\int\frac{\sec^{10}\left(c+dx\right)}{\tan^{4}\left(c+dx\right)-4i\tan^{3}\left(c+dx\right)-6\tan^{2}\left(c+dx\right)+4i\tan\left(c+dx\right)+1}\,dx}{a^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**10/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Integral(sec(c + d*x)**10/(tan(c + d*x)**4 - 4*I*tan(c + d*x)**3 - 6*tan(c
+ d*x)**2 + 4*I*tan(c + d*x) + 1), x)/a**4
```

3.151 $\int \frac{\sec^8(c+dx)}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=90

$$-\frac{i(a-ia\tan(c+dx))^3}{3a^7d}-\frac{i(a-ia\tan(c+dx))^2}{a^6d}-\frac{4\tan(c+dx)}{a^4d}+\frac{8i\log(\cos(c+dx))}{a^4d}+\frac{8x}{a^4}$$

```
[Out] 8*x/a^4+8*I*ln(cos(d*x+c))/a^4/d-4*tan(d*x+c)/a^4/d-I*(a-I*a*tan(d*x+c))^2/
a^6/d-1/3*I*(a-I*a*tan(d*x+c))^3/a^7/d
```

Rubi [A] time = 0.06, antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$-\frac{i(a-ia\tan(c+dx))^3}{3a^7d}-\frac{i(a-ia\tan(c+dx))^2}{a^6d}-\frac{4\tan(c+dx)}{a^4d}+\frac{8i\log(\cos(c+dx))}{a^4d}+\frac{8x}{a^4}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^8/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (8*x)/a^4 + ((8*I)*Log[Cos[c + d*x]])/(a^4*d) - (4*Tan[c + d*x])/(a^4*d) -
(I*(a - I*a*Tan[c + d*x])^2)/(a^6*d) - ((I/3)*(a - I*a*Tan[c + d*x])^3)/(a^
7*d)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^8(c+dx)}{(a+ia\tan(c+dx))^4}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{(a-x)^3}{a+x}\,dx,x,ia\tan(c+dx)\right)}{a^7d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(-4a^2-2a(a-x)-(a-x)^2+\frac{8a^3}{a+x}\right)dx,x,ia\tan(c+dx)\right)}{a^7d}\\ &= \frac{8x}{a^4}+\frac{8i\log(\cos(c+dx))}{a^4d}-\frac{4\tan(c+dx)}{a^4d}-\frac{i(a-ia\tan(c+dx))^2}{a^6d}-\frac{i(a-ia\tan(c+}{3a^7d}\end{aligned}$$

Mathematica [A] time = 0.78, size = 168, normalized size = 1.87

$$\frac{\sec(c)\sec^3(c+dx)(12\sin(2c+dx)-11\sin(2c+3dx)+6dx\cos(2c+3dx)+6dx\cos(4c+3dx)+6i\cos(2c+3d}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^8/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (Sec[c]*Sec[c + d*x]^3*(6*d*x*Cos[2*c + 3*d*x] + 6*d*x*Cos[4*c + 3*d*x] + 6
*Cos[d*x]*(I + 3*d*x + (3*I)*Log[Cos[c + d*x]]) + 6*Cos[2*c + d*x]*(I + 3*d
*x + (3*I)*Log[Cos[c + d*x]]) + (6*I)*Cos[2*c + 3*d*x]*Log[Cos[c + d*x]] +
(6*I)*Cos[4*c + 3*d*x]*Log[Cos[c + d*x]] - 21*Sin[d*x] + 12*Sin[2*c + d*x]
- 11*Sin[2*c + 3*d*x]))/(6*a^4*d)
```

fricas [A] time = 0.50, size = 153, normalized size = 1.70

$$\frac{48\,dxe^{(6i\,dx+6i\,c)} + 48\,dx + (144\,dx - 24i)e^{(4i\,dx+4i\,c)} + (144\,dx - 60i)e^{(2i\,dx+2i\,c)} + \left(24i\,e^{(6i\,dx+6i\,c)} + 72i\,e^{(4i\,dx+4i\,c)} -}{3\left(a^4de^{(6i\,dx+6i\,c)} + 3\,a^4de^{(4i\,dx+4i\,c)} + 3\,a^4de^{(2i\,dx+2i\,c)} + a^4d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/3*(48*d*x*e^(6*I*d*x + 6*I*c) + 48*d*x + (144*d*x - 24*I)*e^(4*I*d*x + 4*
I*c) + (144*d*x - 60*I)*e^(2*I*d*x + 2*I*c) + (24*I*e^(6*I*d*x + 6*I*c) + 7
2*I*e^(4*I*d*x + 4*I*c) + 72*I*e^(2*I*d*x + 2*I*c) + 24*I)*log(e^(2*I*d*x +
 2*I*c) + 1) - 44*I)/(a^4*d*e^(6*I*d*x + 6*I*c) + 3*a^4*d*e^(4*I*d*x + 4*I*
c) + 3*a^4*d*e^(2*I*d*x + 2*I*c) + a^4*d)
```

giac [A] time = 1.99, size = 154, normalized size = 1.71

$$-\frac{2\left(-\frac{12i\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^4} + \frac{24i\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)}{a^4} - \frac{12i\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)}{a^4} + \frac{22i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^6-21\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-78i}{}\right.}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] -2/3*(-12*I*log(tan(1/2*d*x + 1/2*c) + 1)/a^4 + 24*I*log(tan(1/2*d*x + 1/2*
c) - I)/a^4 - 12*I*log(tan(1/2*d*x + 1/2*c) - 1)/a^4 + (22*I*tan(1/2*d*x +
1/2*c)^6 - 21*tan(1/2*d*x + 1/2*c)^5 - 78*I*tan(1/2*d*x + 1/2*c)^4 + 46*tan
(1/2*d*x + 1/2*c)^3 + 78*I*tan(1/2*d*x + 1/2*c)^2 - 21*tan(1/2*d*x + 1/2*c)
 - 22*I)/((tan(1/2*d*x + 1/2*c)^2 - 1)^3*a^4))/d
```

maple [A] time = 0.40, size = 68, normalized size = 0.76

$$-\frac{7\tan(dx+c)}{a^4d} + \frac{\tan^3(dx+c)}{3a^4d} + \frac{2i\left(\tan^2(dx+c)\right)}{a^4d} - \frac{8i\ln(\tan(dx+c)-i)}{a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] -7*tan(d*x+c)/a^4/d+1/3/a^4/d*tan(d*x+c)^3+2*I/a^4/d*tan(d*x+c)^2-8*I/a^4/d
*ln(tan(d*x+c)-I)
```

maxima [A] time = 0.77, size = 53, normalized size = 0.59

$$\frac{\frac{\tan(dx+c)^3+6i\,\tan(dx+c)^2-21\,\tan(dx+c)}{a^4} - \frac{24i\,\log(i\,\tan(dx+c)+1)}{a^4}}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] 1/3*((tan(d*x + c)^3 + 6*I*tan(d*x + c)^2 - 21*tan(d*x + c))/a^4 - 24*I*log
(I*tan(d*x + c) + 1)/a^4)/d
```

mupad [B] time = 3.38, size = 60, normalized size = 0.67

$$-\frac{\frac{7\tan(c+d\,x)}{a^4}-\frac{\tan(c+d\,x)^3}{3\,a^4}+\frac{\ln(\tan(c+d\,x)-\mathrm{i})\,8\mathrm{i}}{a^4}-\frac{\tan(c+d\,x)^2\,2\mathrm{i}}{a^4}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^8*(a + a*tan(c + d*x)*1i)^4),x)
```

```
[Out] -((log(tan(c + d*x) - 1i)*8i)/a^4 + (7*tan(c + d*x))/a^4 - (tan(c + d*x)^2*
2i)/a^4 - tan(c + d*x)^3/(3*a^4))/d
```

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

$$\frac{\int \frac{\sec^8(c+dx)}{\tan^4(c+dx)-4i\tan^3(c+dx)-6\tan^2(c+dx)+4i\tan(c+dx)+1}\,dx}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Integral(sec(c + d*x)**8/(tan(c + d*x)**4 - 4*I*tan(c + d*x)**3 - 6*tan(c +
 d*x)**2 + 4*I*tan(c + d*x) + 1), x)/a**4
```

3.152 $\int \frac{\sec^6(c+dx)}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=63

$$\frac{\tan(c+dx)}{a^4d}+\frac{4i}{d\left(a^4+ia^4\tan(c+dx)\right)}-\frac{4i\log(\cos(c+dx))}{a^4d}-\frac{4x}{a^4}$$

```
[Out] -4*x/a^4-4*I*ln(cos(d*x+c))/a^4/d+tan(d*x+c)/a^4/d+4*I/d/(a^4+I*a^4*tan(d*x
+c))
```

Rubi [A] time = 0.05, antiderivative size = 63, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{\tan(c+dx)}{a^4d}+\frac{4i}{d\left(a^4+ia^4\tan(c+dx)\right)}-\frac{4i\log(\cos(c+dx))}{a^4d}-\frac{4x}{a^4}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (-4*x)/a^4 - ((4*I)*Log[Cos[c + d*x]])/(a^4*d) + Tan[c + d*x]/(a^4*d) + (4*
I)/(d*(a^4 + I*a^4*Tan[c + d*x]))
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sec^6(c+dx)}{(a+ia\tan(c+dx))^4}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{(a-x)^2}{(a+x)^2}\,dx,x,ia\tan(c+dx)\right)}{a^5d}\\
&= -\frac{i\,\text{Subst}\left(\int \left(1+\frac{4a^2}{(a+x)^2}-\frac{4a}{a+x}\right)dx,x,ia\tan(c+dx)\right)}{a^5d}\\
&= -\frac{4x}{a^4}-\frac{4i\log(\cos(c+dx))}{a^4d}+\frac{\tan(c+dx)}{a^4d}+\frac{4i}{d\left(a^4+ia^4\tan(c+dx)\right)}
\end{aligned}$$

Mathematica [B] time = 0.72, size = 214, normalized size = 3.40

$$\sec(c)\sec(c+dx)(-\cos(c+dx)+i\sin(c+dx))(2idx\sin(c+2dx)-2\sin(c+2dx)+2idx\sin(3c+2dx)-\sin$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (Sec[c]*Sec[c + d*x]*(-Cos[c + d*x] + I*Sin[c + d*x])*((-I)*Cos[3*c + 2*d*x
] + 2*d*x*Cos[3*c + 2*d*x] + 2*Cos[c + 2*d*x]*(d*x + I*Log[Cos[c + d*x]]) +
 Cos[c]*(-3*I + 4*d*x + (4*I)*Log[Cos[c + d*x]]) + (2*I)*Cos[3*c + 2*d*x]*L
og[Cos[c + d*x]] + Sin[c] - 2*Sin[c + 2*d*x] + (2*I)*d*x*Sin[c + 2*d*x] - 2
*Log[Cos[c + d*x]]*Sin[c + 2*d*x] - Sin[3*c + 2*d*x] + (2*I)*d*x*Sin[3*c +
2*d*x] - 2*Log[Cos[c + d*x]]*Sin[3*c + 2*d*x]))/(2*a^4*d)
```

fricas [A] time = 0.62, size = 101, normalized size = 1.60

$$-\frac{8\,dxe^{(4i\,dx+4i\,c)} + (8\,dx - 4i)e^{(2i\,dx+2i\,c)} - \left(-4i\,e^{(4i\,dx+4i\,c)} - 4i\,e^{(2i\,dx+2i\,c)}\right)\log\left(e^{(2i\,dx+2i\,c)} + 1\right) - 2i}{a^4de^{(4i\,dx+4i\,c)} + a^4de^{(2i\,dx+2i\,c)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] -(8*d*x*e^(4*I*d*x + 4*I*c) + (8*d*x - 4*I)*e^(2*I*d*x + 2*I*c) - (-4*I*e^(
4*I*d*x + 4*I*c) - 4*I*e^(2*I*d*x + 2*I*c))*log(e^(2*I*d*x + 2*I*c) + 1) -
2*I)/(a^4*d*e^(4*I*d*x + 4*I*c) + a^4*d*e^(2*I*d*x + 2*I*c))
```

giac [B] time = 1.78, size = 145, normalized size = 2.30

$$\frac{2\left(-\frac{2i\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^4} + \frac{4i\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)}{a^4} - \frac{2i\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)}{a^4} + \frac{2i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2i}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)a^4} + \frac{-6i\,\tan\left(\frac{1}{2}\,dx\right.}{a^4}\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 2*(-2*I*log(tan(1/2*d*x + 1/2*c) + 1)/a^4 + 4*I*log(tan(1/2*d*x + 1/2*c) -
I)/a^4 - 2*I*log(tan(1/2*d*x + 1/2*c) - 1)/a^4 + (2*I*tan(1/2*d*x + 1/2*c)^
2 - tan(1/2*d*x + 1/2*c) - 2*I)/((tan(1/2*d*x + 1/2*c)^2 - 1)*a^4) + (-6*I*
tan(1/2*d*x + 1/2*c)^2 - 16*tan(1/2*d*x + 1/2*c) + 6*I)/(a^4*(tan(1/2*d*x +
 1/2*c) - I)^2))/d
```

maple [A] time = 0.39, size = 53, normalized size = 0.84

$$\frac{\tan\left(dx+c\right)}{a^4d} + \frac{4}{a^4d\left(\tan\left(dx+c\right)-i\right)} + \frac{4i\ln\left(\tan\left(dx+c\right)-i\right)}{a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] tan(d*x+c)/a^4/d+4/a^4/d/(tan(d*x+c)-I)+4*I/a^4/d*ln(tan(d*x+c)-I)
```

maxima [A] time = 0.81, size = 96, normalized size = 1.52

$$\frac{\frac{12\left(\tan(dx+c)^2-2i\,\tan(dx+c)-1\right)}{3\,a^4\tan(dx+c)^3-9i\,a^4\tan(dx+c)^2-9\,a^4\tan(dx+c)+3i\,a^4} + \frac{4i\,\log(i\,\tan(dx+c)+1)}{a^4} + \frac{\tan(dx+c)}{a^4}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] (12*(tan(d*x + c)^2 - 2*I*tan(d*x + c) - 1)/(3*a^4*tan(d*x + c)^3 - 9*I*a^4
*tan(d*x + c)^2 - 9*a^4*tan(d*x + c) + 3*I*a^4) + 4*I*log(I*tan(d*x + c) +
1)/a^4 + tan(d*x + c)/a^4)/d
```

mupad [B] time = 3.36, size = 55, normalized size = 0.87

$$\frac{\ln\left(\tan\left(c+d\,x\right)-\mathrm{i}\right)\,4\mathrm{i}}{a^4\,d}+\frac{\tan\left(c+d\,x\right)}{a^4\,d}+\frac{4\mathrm{i}}{a^4\,d\,\left(1+\tan\left(c+d\,x\right)\,1\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^4),x)
```

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

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

$$\frac{\int \frac{\sec^{6}\left(c+dx\right)}{\tan^{4}\left(c+dx\right)-4i\tan^{3}\left(c+dx\right)-6\tan^{2}\left(c+dx\right)+4i\tan\left(c+dx\right)+1}\,dx}{a^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Integral(sec(c + d*x)**6/(tan(c + d*x)**4 - 4*I*tan(c + d*x)**3 - 6*tan(c +
 d*x)**2 + 4*I*tan(c + d*x) + 1), x)/a**4
```

3.153 $\int \frac{\sec^4(c+dx)}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=29

$$\frac{\tan(c+dx)}{d\left(a^2+ia^2\tan(c+dx)\right)^2}$$

```
[Out] tan(d*x+c)/d/(a^2+I*a^2*tan(d*x+c))^2
```

Rubi [A] time = 0.04, antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = $\{3487, 34\}$

$$\frac{\tan(c+dx)}{d\left(a^2+ia^2\tan(c+dx)\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] Tan[c + d*x]/(d*(a^2 + I*a^2*Tan[c + d*x])^2)
```

Rule 34

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^4(c+dx)}{(a+ia\tan(c+dx))^4}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{a-x}{(a+x)^3}\,dx, x, ia\tan(c+dx)\right)}{a^3 d}\\ &= \frac{\tan(c+dx)}{d\left(a^2+ia^2\tan(c+dx)\right)^2}\end{aligned}$$

Mathematica [A] time = 0.07, size = 32, normalized size = 1.10

$$\frac{i\sec^4(c+dx)}{4d(a+ia\tan(c+dx))^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] ((I/4)*Sec[c + d*x]^4)/(d*(a + I*a*Tan[c + d*x])^4)
```

fricas [A] time = 0.66, size = 17, normalized size = 0.59

$$\frac{i\,e^{(-4i\,dx-4i\,c)}}{4\,a^4 d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/4*I*e^(-4*I*d*x - 4*I*c)/(a^4*d)
```

giac [A] time = 1.69, size = 44, normalized size = 1.52

$$-\frac{2\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{3}-\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}{a^{4}d\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] -2*(tan(1/2*d*x + 1/2*c)^3 - tan(1/2*d*x + 1/2*c))/(a^4*d*(tan(1/2*d*x + 1/
2*c) - I)^4)
```

maple [A] time = 0.45, size = 36, normalized size = 1.24

$$\frac{-\frac{1}{\tan(dx+c)-i}-\frac{i}{(\tan(dx+c)-i)^{2}}}{d\,a^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^4,x)
```

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

maxima [B] time = 0.68, size = 67, normalized size = 2.31

$$-\frac{3\left(\tan\left(dx+c\right)^{2}-i\,\tan\left(dx+c\right)\right)}{\left(3\,a^{4}\tan\left(dx+c\right)^{3}-9i\,a^{4}\tan\left(dx+c\right)^{2}-9\,a^{4}\tan\left(dx+c\right)+3i\,a^{4}\right)d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] -3*(tan(d*x + c)^2 - I*tan(d*x + c))/((3*a^4*tan(d*x + c)^3 - 9*I*a^4*tan(d
*x + c)^2 - 9*a^4*tan(d*x + c) + 3*I*a^4)*d)
```

mupad [B] time = 3.39, size = 25, normalized size = 0.86

$$-\frac{\tan\left(c+d\,x\right)}{a^{4}\,d\,\left(\tan\left(c+d\,x\right)-\mathrm{i}\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^4),x)
```

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

sympy [A] time = 3.79, size = 95, normalized size = 3.28

$$\begin{cases} \frac{i\sec^{4}\left(c+dx\right)}{4a^{4}d\tan^{4}\left(c+dx\right)-16ia^{4}d\tan^{3}\left(c+dx\right)-24a^{4}d\tan^{2}\left(c+dx\right)+16ia^{4}d\tan\left(c+dx\right)+4a^{4}d} & \text{for}\: d \neq 0 \\ \frac{x\sec^{4}\left(c\right)}{\left(ia\tan\left(c\right)+a\right)^{4}} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Piecewise((I*sec(c + d*x)**4/(4*a**4*d*tan(c + d*x)**4 - 16*I*a**4*d*tan(c
+ d*x)**3 - 24*a**4*d*tan(c + d*x)**2 + 16*I*a**4*d*tan(c + d*x) + 4*a**4*d
), Ne(d, 0)), (x*sec(c)**4/(I*a*tan(c) + a)**4, True))
```

3.154 $\int \frac{\sec^2(c+dx)}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=27

$$\frac{i}{3ad(a+ia\tan(c+dx))^3}$$

[Out] 1/3*I/a/d/(a+I*a*tan(d*x+c))^3

Rubi [A] time = 0.04, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {3487, 32}

$$\frac{i}{3ad(a+ia\tan(c+dx))^3}$$

Antiderivative was successfully verified.

[In] Int[Sec[c + d*x]^2/(a + I*a*Tan[c + d*x])^4,x]

[Out] (I/3)/(a*d*(a + I*a*Tan[c + d*x])^3)

Rule 32

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^2(c+dx)}{(a+ia\tan(c+dx))^4}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{1}{(a+x)^4}\,dx, x, ia\tan(c+dx)\right)}{ad}\\ &= \frac{i}{3ad(a+ia\tan(c+dx))^3}\end{aligned}$$

Mathematica [B] time = 0.19, size = 56, normalized size = 2.07

$$\frac{i\sec^4(c+dx)(2i\sin(2(c+dx))+4\cos(2(c+dx))+3)}{24a^4d(\tan(c+dx)-i)^4}$$

Antiderivative was successfully verified.

[In] Integrate[Sec[c + d*x]^2/(a + I*a*Tan[c + d*x])^4,x]

[Out] ((I/24)*Sec[c + d*x]^4*(3 + 4*Cos[2*(c + d*x)] + (2*I)*Sin[2*(c + d*x)]))/(a^4*d*(-I + Tan[c + d*x])^4)

fricas [A] time = 0.58, size = 41, normalized size = 1.52

$$\frac{\left(3i\,e^{(4i\,dx+4i\,c)}+3i\,e^{(2i\,dx+2i\,c)}+i\right)e^{(-6i\,dx-6i\,c)}}{24\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

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

giac [B] time = 1.66, size = 85, normalized size = 3.15

$$-\frac{2\left(3\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^{5}-6i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^{4}-10\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^{3}+6i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^{2}+3\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)\right)}{3a^{4}d\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-i\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] -2/3*(3*tan(1/2*d*x + 1/2*c)^5 - 6*I*tan(1/2*d*x + 1/2*c)^4 - 10*tan(1/2*d*
x + 1/2*c)^3 + 6*I*tan(1/2*d*x + 1/2*c)^2 + 3*tan(1/2*d*x + 1/2*c))/(a^4*d*
(tan(1/2*d*x + 1/2*c) - I)^6)
```

maple [A] time = 0.27, size = 24, normalized size = 0.89

$$\frac{i}{3ad\left(a+ia\tan\left(dx+c\right)\right)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 1/3*I/a/d/(a+I*a*tan(d*x+c))^3
```

maxima [A] time = 0.38, size = 21, normalized size = 0.78

$$\frac{i}{3\left(i\,a\tan\left(dx+c\right)+a\right)^{3}ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] 1/3*I/((I*a*tan(d*x + c) + a)^3*a*d)
```

mupad [B] time = 3.40, size = 19, normalized size = 0.70

$$-\frac{1}{3\,a^{4}\,d\,\left(\tan\left(c+d\,x\right)-\mathrm{i}\right)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^4),x)
```

```
[Out] -1/(3*a^4*d*(tan(c + d*x) - 1i)^3)
```

sympy [A] time = 3.88, size = 272, normalized size = 10.07

$$\begin{cases} -\frac{i\tan^{2}\left(c+dx\right)\sec^{2}\left(c+dx\right)}{24a^{4}d\tan^{4}\left(c+dx\right)-96ia^{4}d\tan^{3}\left(c+dx\right)-144a^{4}d\tan^{2}\left(c+dx\right)+96ia^{4}d\tan\left(c+dx\right)+24a^{4}d}-\frac{4\tan\left(c+dx\right)\sec^{2}\left(c+dx\right)}{24a^{4}d\tan^{4}\left(c+dx\right)-96ia^{4}d\tan^{3}\left(c+dx\right)-144a^{4}d\tan^{2}\left(c+d\right.} \\ \frac{x\sec^{2}\left(c\right)}{\left(ia\tan\left(c\right)+a\right)^{4}} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Piecewise((-I*tan(c + d*x)**2*sec(c + d*x)**2/(24*a**4*d*tan(c + d*x)**4 -
96*I*a**4*d*tan(c + d*x)**3 - 144*a**4*d*tan(c + d*x)**2 + 96*I*a**4*d*tan(
c + d*x) + 24*a**4*d) - 4*tan(c + d*x)*sec(c + d*x)**2/(24*a**4*d*tan(c + d
*x)**4 - 96*I*a**4*d*tan(c + d*x)**3 - 144*a**4*d*tan(c + d*x)**2 + 96*I*a*
*4*d*tan(c + d*x) + 24*a**4*d) + 7*I*sec(c + d*x)**2/(24*a**4*d*tan(c + d*x
)**4 - 96*I*a**4*d*tan(c + d*x)**3 - 144*a**4*d*tan(c + d*x)**2 + 96*I*a**4
*d*tan(c + d*x) + 24*a**4*d), Ne(d, 0)), (x*sec(c)**2/(I*a*tan(c) + a)**4,
True))
```

3.155 $\int \frac{1}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=116

$$\frac{i}{16d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{x}{16a^4}+\frac{i}{16d\left(a^2+ia^2\tan(c+dx)\right)^2}+\frac{i}{12ad(a+ia\tan(c+dx))^3}+\frac{i}{8d(a+ia\tan(c+dx))}$$

```
[Out] 1/16*x/a^4+1/8*I/d/(a+I*a*tan(d*x+c))^4+1/12*I/a/d/(a+I*a*tan(d*x+c))^3+1/1
6*I/d/(a^2+I*a^2*tan(d*x+c))^2+1/16*I/d/(a^4+I*a^4*tan(d*x+c))
```

Rubi [A] time = 0.06, antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {3479, 8}

$$\frac{i}{16d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{i}{16d\left(a^2+ia^2\tan(c+dx)\right)^2}+\frac{x}{16a^4}+\frac{i}{12ad(a+ia\tan(c+dx))^3}+\frac{i}{8d(a+ia\tan(c+dx))}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^(-4),x]
```

```
[Out] x/(16*a^4) + (I/8)/(d*(a + I*a*Tan[c + d*x])^4) + (I/12)/(a*d*(a + I*a*Tan[
c + d*x])^3) + (I/16)/(d*(a^2 + I*a^2*Tan[c + d*x])^2) + (I/16)/(d*(a^4 + I
*a^4*Tan[c + d*x]))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 3479

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

Rubi steps

$$\begin{aligned}
\int \frac{1}{(a+ia\tan(c+dx))^4}\,dx &= \frac{i}{8d(a+ia\tan(c+dx))^4}+\frac{\int \frac{1}{(a+ia\tan(c+dx))^3}\,dx}{2a}\\
&= \frac{i}{8d(a+ia\tan(c+dx))^4}+\frac{i}{12ad(a+ia\tan(c+dx))^3}+\frac{\int \frac{1}{(a+ia\tan(c+dx))^2}\,dx}{4a^2}\\
&= \frac{i}{8d(a+ia\tan(c+dx))^4}+\frac{i}{12ad(a+ia\tan(c+dx))^3}+\frac{i}{16d\left(a^2+ia^2\tan(c+dx)\right)^2}\\
&= \frac{i}{8d(a+ia\tan(c+dx))^4}+\frac{i}{12ad(a+ia\tan(c+dx))^3}+\frac{i}{16d\left(a^2+ia^2\tan(c+dx)\right)^2}\\
&= \frac{x}{16a^4}+\frac{i}{8d(a+ia\tan(c+dx))^4}+\frac{i}{12ad(a+ia\tan(c+dx))^3}+\frac{i}{16d\left(a^2+ia^2\tan(c+\right.}
\end{aligned}$$

Mathematica [A] time = 0.23, size = 98, normalized size = 0.84

$$\frac{\sec^4(c+dx)(-32\sin(2(c+dx))+24idx\sin(4(c+dx))+3\sin(4(c+dx))+64i\cos(2(c+dx))+3(8dx+i)\cos(4}{384a^4d(\tan(c+dx)-i)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^(-4),x]
```

```
[Out] (Sec[c + d*x]^4*(36*I + (64*I)*Cos[2*(c + d*x)] + 3*(I + 8*d*x)*Cos[4*(c + d*x)] - 32*Sin[2*(c + d*x)] + 3*Sin[4*(c + d*x)] + (24*I)*d*x*Sin[4*(c + d*x)]))/(384*a^4*d*(-I + Tan[c + d*x])^4)
```

fricas [**A**] time = 0.40, size = 65, normalized size = 0.56

$$\frac{\left(24\,dxe^{(8i\,dx+8i\,c)}+48i\,e^{(6i\,dx+6i\,c)}+36i\,e^{(4i\,dx+4i\,c)}+16i\,e^{(2i\,dx+2i\,c)}+3i\right)e^{(-8i\,dx-8i\,c)}}{384\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/384*(24*d*x*e^(8*I*d*x + 8*I*c) + 48*I*e^(6*I*d*x + 6*I*c) + 36*I*e^(4*I*d*x + 4*I*c) + 16*I*e^(2*I*d*x + 2*I*c) + 3*I)*e^(-8*I*d*x - 8*I*c)/(a^4*d)
```

giac [**A**] time = 0.89, size = 92, normalized size = 0.79

$$-\frac{-\frac{12i\,\log(-i\,\tan(dx+c)+1)}{a^4}+\frac{12i\,\log(-i\,\tan(dx+c)-1)}{a^4}+\frac{-25i\,\tan(dx+c)^4-124\,\tan(dx+c)^3+246i\,\tan(dx+c)^2+252\,\tan(dx+c)-153i}{a^4(\tan(dx+c)-i)^4}}{384\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] -1/384*(-12*I*log(-I*tan(d*x + c) + 1)/a^4 + 12*I*log(-I*tan(d*x + c) - 1)/a^4 + (-25*I*tan(d*x + c)^4 - 124*tan(d*x + c)^3 + 246*I*tan(d*x + c)^2 + 252*tan(d*x + c) - 153*I)/(a^4*(tan(d*x + c) - I)^4))/d
```

maple [**A**] time = 0.11, size = 118, normalized size = 1.02

$$\frac{i\ln\left(\tan\left(dx+c\right)+i\right)}{32d\,a^4}+\frac{i}{8d\,a^4\left(\tan\left(dx+c\right)-i\right)^4}-\frac{i\ln\left(\tan\left(dx+c\right)-i\right)}{32a^4d}-\frac{i}{16d\,a^4\left(\tan\left(dx+c\right)-i\right)^2}-\frac{1}{12d\,a^4\left(\tan\left(\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 1/32*I/d/a^4*ln(tan(d*x+c)+I)+1/8*I/d/a^4/(tan(d*x+c)-I)^4-1/32*I/d/a^4*ln(tan(d*x+c)-I)-1/16*I/d/a^4/(tan(d*x+c)-I)^2-1/12/d/a^4/(tan(d*x+c)-I)^3+1/16/a^4/d/(tan(d*x+c)-I)
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima: expt: undefined: 0 to a negative exponent.
```

mupad [**B**] time = 3.50, size = 60, normalized size = 0.52

$$\frac{x}{16\,a^4}-\frac{-\frac{\tan(c+d\,x)^3}{16}+\frac{\tan(c+d\,x)^2\,1\mathrm{i}}{4}+\frac{19\,\tan(c+d\,x)}{48}-\frac{1}{3}\mathrm{i}}{a^4\,d\,\left(1+\tan\left(c+d\,x\right)\,1\mathrm{i}\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a + a*tan(c + d*x)*1i)^4,x)
```

```
[Out] x/(16*a^4) - ((19*tan(c + d*x))/48 + (tan(c + d*x)^2*1i)/4 - tan(c + d*x)^3
/16 - 1i/3)/(a^4*d*(tan(c + d*x)*1i + 1)^4)
```

sympy [A] time = 0.41, size = 190, normalized size = 1.64

$$\begin{cases} \frac{\left(98304ia^{12}d^{3}e^{18ic}e^{-2idx}+73728ia^{12}d^{3}e^{16ic}e^{-4idx}+32768ia^{12}d^{3}e^{14ic}e^{-6idx}+6144ia^{12}d^{3}e^{12ic}e^{-8idx}\right)e^{-20ic}}{786432a^{16}d^{4}} & \text{for } 786432a^{16}d^{4}e^{20ic} \neq 0 \\ x\left(\frac{\left(e^{8ic}+4e^{6ic}+6e^{4ic}+4e^{2ic}+1\right)e^{-8ic}}{16a^{4}} - \frac{1}{16a^{4}}\right) & \text{otherwise} \end{cases} + \frac{x}{16a^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Piecewise(((98304*I*a**12*d**3*exp(18*I*c)*exp(-2*I*d*x) + 73728*I*a**12*d*
*3*exp(16*I*c)*exp(-4*I*d*x) + 32768*I*a**12*d**3*exp(14*I*c)*exp(-6*I*d*x)
 + 6144*I*a**12*d**3*exp(12*I*c)*exp(-8*I*d*x))*exp(-20*I*c)/(786432*a**16*
d**4), Ne(786432*a**16*d**4*exp(20*I*c), 0)), (x*((exp(8*I*c) + 4*exp(6*I*c
) + 6*exp(4*I*c) + 4*exp(2*I*c) + 1)*exp(-8*I*c)/(16*a**4) - 1/(16*a**4)),
True)) + x/(16*a**4)
```

3.156 $\int \frac{\cos^2(c+dx)}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=169

$$-\frac{i}{64d\left(a^4-ia^4\tan(c+dx)\right)}+\frac{5i}{64d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{3x}{32a^4}+\frac{i}{16d\left(a^2+ia^2\tan(c+dx)\right)^2}+\frac{ia}{20d(a+ia\tan(c$$

```
[Out] 3/32*x/a^4+1/20*I*a/d/(a+I*a*tan(d*x+c))^5+1/16*I/d/(a+I*a*tan(d*x+c))^4+1/
16*I/a/d/(a+I*a*tan(d*x+c))^3+1/16*I/d/(a^2+I*a^2*tan(d*x+c))^2-1/64*I/d/(a
^4-I*a^4*tan(d*x+c))+5/64*I/d/(a^4+I*a^4*tan(d*x+c))
```

Rubi [A] time = 0.10, antiderivative size = 169, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3487, 44, 206}

$$-\frac{i}{64d\left(a^4-ia^4\tan(c+dx)\right)}+\frac{5i}{64d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{i}{16d\left(a^2+ia^2\tan(c+dx)\right)^2}+\frac{3x}{32a^4}+\frac{ia}{20d(a+ia\tan(c$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (3*x)/(32*a^4) + ((I/20)*a)/(d*(a + I*a*Tan[c + d*x])^5) + (I/16)/(d*(a + I
*a*Tan[c + d*x])^4) + (I/16)/(a*d*(a + I*a*Tan[c + d*x])^3) + (I/16)/(d*(a^
2 + I*a^2*Tan[c + d*x])^2) - (I/64)/(d*(a^4 - I*a^4*Tan[c + d*x])) + ((5*I)
/64)/(d*(a^4 + I*a^4*Tan[c + d*x]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 206

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^2(c+dx)}{(a+ia\tan(c+dx))^4}\,dx = -\frac{(ia^3)\,\text{Subst}\left(\int \frac{1}{(a-x)^2(a+x)^6}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{(ia^3)\,\text{Subst}\left(\int \left(\frac{1}{64a^6(a-x)^2} + \frac{1}{4a^2(a+x)^6} + \frac{1}{4a^3(a+x)^5} + \frac{3}{16a^4(a+x)^4} + \frac{1}{8a^5(a+x)^3} + \frac{5}{64a^6(a+x)^2}\right.\right.}{d}$$

$$= \frac{ia}{20d(a+ia\tan(c+dx))^5} + \frac{i}{16d(a+ia\tan(c+dx))^4} + \frac{i}{16ad(a+ia\tan(c+dx))^3} +$$

$$= \frac{3x}{32a^4} + \frac{ia}{20d(a+ia\tan(c+dx))^5} + \frac{i}{16d(a+ia\tan(c+dx))^4} + \frac{i}{16ad(a+ia\tan(c+$$

Mathematica [A] time = 0.34, size = 120, normalized size = 0.71

$$\frac{\sec^4(c+dx)(-100\sin(2(c+dx)) + 120idx\sin(4(c+dx)) + 15\sin(4(c+dx)) + 12\sin(6(c+dx)) + 200i\cos(2(c+}{1280a^4d(\tan(c+dx)-i)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (Sec[c + d*x]^4*(100*I + (200*I)*Cos[2*(c + d*x)] + 15*(I + 8*d*x)*Cos[4*(c
 + d*x)] - (8*I)*Cos[6*(c + d*x)] - 100*Sin[2*(c + d*x)] + 15*Sin[4*(c + d*
x)] + (120*I)*d*x*Sin[4*(c + d*x)] + 12*Sin[6*(c + d*x)]))/(1280*a^4*d*(-I
+ Tan[c + d*x])^4)
```

fricas [A] time = 0.64, size = 87, normalized size = 0.51

$$\frac{\left(120\,dxe^{(10i\,dx+10i\,c)} - 10i\,e^{(12i\,dx+12i\,c)} + 150i\,e^{(8i\,dx+8i\,c)} + 100i\,e^{(6i\,dx+6i\,c)} + 50i\,e^{(4i\,dx+4i\,c)} + 15i\,e^{(2i\,dx+2i\,c)} + 2i\right)e^{(-10i}}{1280\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/1280*(120*d*x*e^(10*I*d*x + 10*I*c) - 10*I*e^(12*I*d*x + 12*I*c) + 150*I*
e^(8*I*d*x + 8*I*c) + 100*I*e^(6*I*d*x + 6*I*c) + 50*I*e^(4*I*d*x + 4*I*c)
+ 15*I*e^(2*I*d*x + 2*I*c) + 2*I)*e^(-10*I*d*x - 10*I*c)/(a^4*d)
```

giac [A] time = 2.12, size = 123, normalized size = 0.73

$$-\frac{-\frac{60i\log(\tan(dx+c)+i)}{a^4} + \frac{60i\log(\tan(dx+c)-i)}{a^4} + \frac{20(3i\tan(dx+c)-4)}{a^4(\tan(dx+c)+i)} + \frac{-137i\tan(dx+c)^5 - 785\tan(dx+c)^4 + 1850i\tan(dx+c)^3 + 2290\tan(dx+c}{a^4(\tan(dx+c)-i)^5}}{1280\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] -1/1280*(-60*I*log(tan(d*x + c) + I)/a^4 + 60*I*log(tan(d*x + c) - I)/a^4 +
 20*(3*I*tan(d*x + c) - 4)/(a^4*(tan(d*x + c) + I)) + (-137*I*tan(d*x + c)^
5 - 785*tan(d*x + c)^4 + 1850*I*tan(d*x + c)^3 + 2290*tan(d*x + c)^2 - 1565
*I*tan(d*x + c) - 541)/(a^4*(tan(d*x + c) - I)^5))/d
```

maple [A] time = 0.43, size = 156, normalized size = 0.92

$$\frac{3i\ln(\tan(dx+c)+i)}{64d\,a^4} + \frac{1}{64a^4d(\tan(dx+c)+i)} - \frac{3i\ln(\tan(dx+c)-i)}{64a^4d} + \frac{i}{16d\,a^4(\tan(dx+c)-i)^4} - \frac{i}{16d\,a^4(\tan(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 3/64*I/a^4/d*ln(tan(d*x+c)+I)+1/64/a^4/d/(tan(d*x+c)+I)-3/64*I/a^4/d*ln(tan
(d*x+c)-I)+1/16*I/a^4/d/(tan(d*x+c)-I)^4-1/16*I/d/a^4/(tan(d*x+c)-I)^2+1/20
/a^4/d/(tan(d*x+c)-I)^5-1/16/d/a^4/(tan(d*x+c)-I)^3+5/64/a^4/d/(tan(d*x+c)-
I)
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 4.13, size = 90, normalized size = 0.53

$$\frac{3\,x}{32\,a^4}-\frac{-\frac{3\,{\mathrm{tan}\left(c+d\,x\right)}^5}{32}+\frac{{\mathrm{tan}\left(c+d\,x\right)}^4\,3{}\mathrm{i}}{8}+\frac{{\mathrm{tan}\left(c+d\,x\right)}^3}{2}-\frac{{\mathrm{tan}\left(c+d\,x\right)}^2\,1{}\mathrm{i}}{8}+\frac{47\,\mathrm{tan}\left(c+d\,x\right)}{160}-\frac{3}{10}{}\mathrm{i}}{a^4\,d\,{\left(\mathrm{tan}\left(c+d\,x\right)-\mathrm{i}\right)}^5\,\left(\mathrm{tan}\left(c+d\,x\right)+1{}\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2/(a + a*tan(c + d*x)*1i)^4,x)
```

```
[Out] (3*x)/(32*a^4) - ((47*tan(c + d*x))/160 - (tan(c + d*x)^2*1i)/8 + tan(c + d
*x)^3/2 + (tan(c + d*x)^4*3i)/8 - (3*tan(c + d*x)^5)/32 - 3i/10)/(a^4*d*(ta
n(c + d*x) - 1i)^5*(tan(c + d*x) + 1i))
```

sympy [A] time = 0.56, size = 260, normalized size = 1.54

$$\begin{cases} \frac{\left(-171798691840ia^{20}d^{5}e^{32ic}e^{2idx}+2576980377600ia^{20}d^{5}e^{28ic}e^{-2idx}+1717986918400ia^{20}d^{5}e^{26ic}e^{-4idx}+858993459200ia^{20}d^{5}e^{24ic}e^{-6idx}+25769803\ldots}{21990232555520a^{24}d^{6}} \\ x\left(\frac{\left(e^{12ic}+6e^{10ic}+15e^{8ic}+20e^{6ic}+15e^{4ic}+6e^{2ic}+1\right)e^{-10ic}}{64a^{4}}-\frac{3}{32a^{4}}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Piecewise(((-171798691840*I*a**20*d**5*exp(32*I*c)*exp(2*I*d*x) + 257698037
7600*I*a**20*d**5*exp(28*I*c)*exp(-2*I*d*x) + 1717986918400*I*a**20*d**5*ex
p(26*I*c)*exp(-4*I*d*x) + 858993459200*I*a**20*d**5*exp(24*I*c)*exp(-6*I*d*
x) + 257698037760*I*a**20*d**5*exp(22*I*c)*exp(-8*I*d*x) + 34359738368*I*a*
*20*d**5*exp(20*I*c)*exp(-10*I*d*x))*exp(-30*I*c)/(21990232555520*a**24*d**
6), Ne(21990232555520*a**24*d**6*exp(30*I*c), 0)), (x*((exp(12*I*c) + 6*exp
(10*I*c) + 15*exp(8*I*c) + 20*exp(6*I*c) + 15*exp(4*I*c) + 6*exp(2*I*c) + 1
)*exp(-10*I*c)/(64*a**4) - 3/(32*a**4)), True)) + 3*x/(32*a**4)
```

3.157 $\int \frac{\cos^4(c+dx)}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=224

$$-\frac{7i}{256d\left(a^4-ia^4\tan(c+dx)\right)}+\frac{21i}{256d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{7x}{64a^4}+\frac{ia^2}{48d(a+ia\tan(c+dx))^6}-\frac{i}{256d\left(a^2-ia^2\tan(c\right.}$$

```
[Out] 7/64*x/a^4+1/48*I*a^2/d/(a+I*a*tan(d*x+c))^6+3/80*I*a/d/(a+I*a*tan(d*x+c))^
5+3/64*I/d/(a+I*a*tan(d*x+c))^4+5/96*I/a/d/(a+I*a*tan(d*x+c))^3-1/256*I/d/(
a^2-I*a^2*tan(d*x+c))^2+15/256*I/d/(a^2+I*a^2*tan(d*x+c))^2-7/256*I/d/(a^4-
I*a^4*tan(d*x+c))+21/256*I/d/(a^4+I*a^4*tan(d*x+c))
```

Rubi [A] time = 0.12, antiderivative size = 224, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3487, 44, 206}

$$\frac{ia^2}{48d(a+ia\tan(c+dx))^6}-\frac{7i}{256d\left(a^4-ia^4\tan(c+dx)\right)}+\frac{21i}{256d\left(a^4+ia^4\tan(c+dx)\right)}-\frac{i}{256d\left(a^2-ia^2\tan(c+dx)\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (7*x)/(64*a^4) + ((I/48)*a^2)/(d*(a + I*a*Tan[c + d*x])^6) + (((3*I)/80)*a)
/(d*(a + I*a*Tan[c + d*x])^5) + ((3*I)/64)/(d*(a + I*a*Tan[c + d*x])^4) + (
(5*I)/96)/(a*d*(a + I*a*Tan[c + d*x])^3) - (I/256)/(d*(a^2 - I*a^2*Tan[c +
d*x])^2) + ((15*I)/256)/(d*(a^2 + I*a^2*Tan[c + d*x])^2) - ((7*I)/256)/(d*(
a^4 - I*a^4*Tan[c + d*x])) + ((21*I)/256)/(d*(a^4 + I*a^4*Tan[c + d*x]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 206

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^4(c+dx)}{(a+ia\tan(c+dx))^4}\,dx = -\frac{(ia^5)\,\text{Subst}\left(\int \frac{1}{(a-x)^3(a+x)^7}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{(ia^5)\,\text{Subst}\left(\int \left(\frac{1}{128a^7(a-x)^3} + \frac{7}{256a^8(a-x)^2} + \frac{1}{8a^3(a+x)^7} + \frac{3}{16a^4(a+x)^6} + \frac{3}{16a^5(a+x)^5} + \frac{}{32}\right.\right.}{d}$$

$$= \frac{ia^2}{48d(a+ia\tan(c+dx))^6} + \frac{3ia}{80d(a+ia\tan(c+dx))^5} + \frac{3i}{64d(a+ia\tan(c+dx))^4}$$

$$= \frac{7x}{64a^4} + \frac{ia^2}{48d(a+ia\tan(c+dx))^6} + \frac{3ia}{80d(a+ia\tan(c+dx))^5} + \frac{3i}{64d(a+ia\tan(c}$$

Mathematica [A] time = 0.76, size = 142, normalized size = 0.63

$$\frac{\sec^4(c+dx)(-560\sin(2(c+dx)) + 840idx\sin(4(c+dx)) + 105\sin(4(c+dx)) + 144\sin(6(c+dx)) + 10\sin(8}{7680a^4d(\tan}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (Sec[c + d*x]^4*(525*I + (1120*I)*Cos[2*(c + d*x)] + 105*(I + 8*d*x)*Cos[4*
(c + d*x)] - (96*I)*Cos[6*(c + d*x)] - (5*I)*Cos[8*(c + d*x)] - 560*Sin[2*(
c + d*x)] + 105*Sin[4*(c + d*x)] + (840*I)*d*x*Sin[4*(c + d*x)] + 144*Sin[6
*(c + d*x)] + 10*Sin[8*(c + d*x)]))/(7680*a^4*d*(-I + Tan[c + d*x])^4)
```

fricas [A] time = 0.56, size = 109, normalized size = 0.49

$$\frac{\left(1680\,dxe^{(12i\,dx+12i\,c)} - 15i\,e^{(16i\,dx+16i\,c)} - 240i\,e^{(14i\,dx+14i\,c)} + 1680i\,e^{(10i\,dx+10i\,c)} + 1050i\,e^{(8i\,dx+8i\,c)} + 560i\,e^{(6i\,dx+6}\right.}{15360\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/15360*(1680*d*x*e^(12*I*d*x + 12*I*c) - 15*I*e^(16*I*d*x + 16*I*c) - 240*
I*e^(14*I*d*x + 14*I*c) + 1680*I*e^(10*I*d*x + 10*I*c) + 1050*I*e^(8*I*d*x
+ 8*I*c) + 560*I*e^(6*I*d*x + 6*I*c) + 210*I*e^(4*I*d*x + 4*I*c) + 48*I*e^(
2*I*d*x + 2*I*c) + 5*I)*e^(-12*I*d*x - 12*I*c)/(a^4*d)
```

giac [A] time = 2.16, size = 147, normalized size = 0.66

$$-\frac{-\frac{420i\log(-i\tan(dx+c)+1)}{a^4} + \frac{420i\log(-i\tan(dx+c)-1)}{a^4} + \frac{30\left(21i\tan(dx+c)^2 - 49\tan(dx+c) - 29i\right)}{a^4(\tan(dx+c)+i)^2} + \frac{-1029i\tan(dx+c)^6 - 6804\tan(dx+c)^5}{}}{7680\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] -1/7680*(-420*I*log(-I*tan(d*x + c) + 1)/a^4 + 420*I*log(-I*tan(d*x + c) -
1)/a^4 + 30*(21*I*tan(d*x + c)^2 - 49*tan(d*x + c) - 29*I)/(a^4*(tan(d*x +
c) + I)^2) + (-1029*I*tan(d*x + c)^6 - 6804*tan(d*x + c)^5 + 19035*I*tan(d*
x + c)^4 + 29080*tan(d*x + c)^3 - 25995*I*tan(d*x + c)^2 - 13332*tan(d*x +
c) + 3317*I)/(a^4*(tan(d*x + c) - I)^6))/d
```

maple [A] time = 0.43, size = 196, normalized size = 0.88

$$\frac{i}{256a^4d\left(\tan\left(dx+c\right)+i\right)^2}+\frac{7i\ln\left(\tan\left(dx+c\right)+i\right)}{128d\,a^4}+\frac{7}{256a^4d\left(\tan\left(dx+c\right)+i\right)}-\frac{7i\ln\left(\tan\left(dx+c\right)-i\right)}{128a^4d}+\frac{}{64d\,a^4\left(\tan\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 1/256*I/a^4/d/(tan(d*x+c)+I)^2+7/128*I/a^4/d*ln(tan(d*x+c)+I)+7/256/a^4/d/(
tan(d*x+c)+I)-7/128*I/a^4/d*ln(tan(d*x+c)-I)+3/64*I/a^4/d/(tan(d*x+c)-I)^4-
1/48*I/a^4/d/(tan(d*x+c)-I)^6-15/256*I/a^4/d/(tan(d*x+c)-I)^2+3/80/a^4/d/(t
an(d*x+c)-I)^5-5/96/d/a^4/(tan(d*x+c)-I)^3+21/256/a^4/d/(tan(d*x+c)-I)
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 4.94, size = 197, normalized size = 0.88

$$\frac{7\,x}{64\,a^4}+\frac{\frac{\tan(c+d\,x)\,169\mathrm{i}}{960\,a^4}+\frac{4}{15\,a^4}+\frac{119\,\tan(c+d\,x)^2}{240\,a^4}+\frac{\tan(c+d\,x)^3\,889\mathrm{i}}{960\,a^4}-\frac{7\,\tan(c+d\,x)^4}{24\,a^4}+\frac{\tan(c+d\,x)^5\,91\mathrm{i}}{192\,a^4}-\frac{7\,\mathrm{t}}{}}{d\,\left(-\tan\left(c+d\,x\right)^8\,1\mathrm{i}-4\,\tan\left(c+d\,x\right)^7+\tan\left(c+d\,x\right)^6\,4\mathrm{i}-4\,\tan\left(c+d\,x\right)^5+\tan\left(c+d\,x\right)^4\,10\mathrm{i}+4\,\tan\left(c+\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4/(a + a*tan(c + d*x)*1i)^4,x)
```

```
[Out] (7*x)/(64*a^4) + ((tan(c + d*x)*169i)/(960*a^4) + 4/(15*a^4) + (119*tan(c +
 d*x)^2)/(240*a^4) + (tan(c + d*x)^3*889i)/(960*a^4) - (7*tan(c + d*x)^4)/(
24*a^4) + (tan(c + d*x)^5*91i)/(192*a^4) - (7*tan(c + d*x)^6)/(16*a^4) - (t
an(c + d*x)^7*7i)/(64*a^4))/(d*(4*tan(c + d*x) + tan(c + d*x)^2*4i + 4*tan(
c + d*x)^3 + tan(c + d*x)^4*10i - 4*tan(c + d*x)^5 + tan(c + d*x)^6*4i - 4*
tan(c + d*x)^7 - tan(c + d*x)^8*1i - 1i))
```

sympy [A] time = 0.68, size = 328, normalized size = 1.46

$$\begin{cases}\frac{\left(-202661983231672320ia^{28}d^7e^{46ic}e^{4idx}-3242591731706757120ia^{28}d^7e^{44ic}e^{2idx}+2269814212194729984 0ia^{28}d^7e^{40ic}e^{-2idx}+1418633882621706240 0i\right.}{} \\ x\left(\frac{\left(e^{16ic}+8e^{14ic}+28e^{12ic}+56e^{10ic}+70e^{8ic}+56e^{6ic}+28e^{4ic}+8e^{2ic}+1\right)e^{-12ic}}{256a^4}-\frac{7}{64a^4}\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Piecewise(((-202661983231672320*I*a**28*d**7*exp(46*I*c)*exp(4*I*d*x) - 324
2591731706757120*I*a**28*d**7*exp(44*I*c)*exp(2*I*d*x) + 226981421219472998
40*I*a**28*d**7*exp(40*I*c)*exp(-2*I*d*x) + 14186338826217062400*I*a**28*d*
*7*exp(38*I*c)*exp(-4*I*d*x) + 7566047373982433280*I*a**28*d**7*exp(36*I*c)
*exp(-6*I*d*x) + 2837267765243412480*I*a**28*d**7*exp(34*I*c)*exp(-8*I*d*x)
 + 648518346341351424*I*a**28*d**7*exp(32*I*c)*exp(-10*I*d*x) + 67553994410
557440*I*a**28*d**7*exp(30*I*c)*exp(-12*I*d*x))*exp(-42*I*c)/(2075258708292
32455680*a**32*d**8), Ne(207525870829232455680*a**32*d**8*exp(42*I*c), 0)),
 (x*((exp(16*I*c) + 8*exp(14*I*c) + 28*exp(12*I*c) + 56*exp(10*I*c) + 70*ex
p(8*I*c) + 56*exp(6*I*c) + 28*exp(4*I*c) + 8*exp(2*I*c) + 1)*exp(-12*I*c)/(
256*a**4) - 7/(64*a**4)), True)) + 7*x/(64*a**4)
```

3.158 $\int \frac{\sec^9(c+dx)}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=133

$$\frac{35\tanh^{-1}(\sin(c+dx))}{8a^4d}-\frac{14i\sec^5(c+dx)}{3d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{35\tan(c+dx)\sec^3(c+dx)}{12a^4d}+\frac{35\tan(c+dx)\sec(c+dx)}{8a^4d}-$$

```
[Out] 35/8*arctanh(sin(d*x+c))/a^4/d+35/8*sec(d*x+c)*tan(d*x+c)/a^4/d+35/12*sec(d
*x+c)^3*tan(d*x+c)/a^4/d-2*I*sec(d*x+c)^7/a/d/(a+I*a*tan(d*x+c))^3-14/3*I*s
ec(d*x+c)^5/d/(a^4+I*a^4*tan(d*x+c))
```

Rubi [A] time = 0.11, antiderivative size = 133, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3500, 3768, 3770}

$$\frac{35\tanh^{-1}(\sin(c+dx))}{8a^4d}-\frac{14i\sec^5(c+dx)}{3d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{35\tan(c+dx)\sec^3(c+dx)}{12a^4d}+\frac{35\tan(c+dx)\sec(c+dx)}{8a^4d}-$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^9/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (35*ArcTanh[Sin[c + d*x]])/(8*a^4*d) + (35*Sec[c + d*x]*Tan[c + d*x])/(8*a^
4*d) + (35*Sec[c + d*x]^3*Tan[c + d*x])/(12*a^4*d) - ((2*I)*Sec[c + d*x]^7)
/(a*d*(a + I*a*Tan[c + d*x])^3) - (((14*I)/3)*Sec[c + d*x]^5)/(d*(a^4 + I*a
^4*Tan[c + d*x]))
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3768

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \frac{\sec^9(c+dx)}{(a+ia\tan(c+dx))^4}\,dx = -\frac{2i\sec^7(c+dx)}{ad(a+ia\tan(c+dx))^3} + \frac{7\int \frac{\sec^7(c+dx)}{(a+ia\tan(c+dx))^2}\,dx}{a^2}$$
$$= -\frac{2i\sec^7(c+dx)}{ad(a+ia\tan(c+dx))^3} - \frac{14i\sec^5(c+dx)}{3d\left(a^4+ia^4\tan(c+dx)\right)} + \frac{35\int \sec^5(c+dx)\,dx}{3a^4}$$
$$= \frac{35\sec^3(c+dx)\tan(c+dx)}{12a^4d} - \frac{2i\sec^7(c+dx)}{ad(a+ia\tan(c+dx))^3} - \frac{14i\sec^5(c+dx)}{3d\left(a^4+ia^4\tan(c+dx)\right)} +$$
$$= \frac{35\sec(c+dx)\tan(c+dx)}{8a^4d} + \frac{35\sec^3(c+dx)\tan(c+dx)}{12a^4d} - \frac{2i\sec^7(c+dx)}{ad(a+ia\tan(c+dx))^3}$$
$$= \frac{35\tanh^{-1}(\sin(c+dx))}{8a^4d} + \frac{35\sec(c+dx)\tan(c+dx)}{8a^4d} + \frac{35\sec^3(c+dx)\tan(c+dx)}{12a^4d}$$

Mathematica [A] time = 1.20, size = 237, normalized size = 1.78

$$-\frac{\sec^4(c+dx)\left(896i\cos(c+dx) + 3\left(42\sin(c+dx) + 58\sin(3(c+dx)) + 128i\cos(3(c+dx)) + 35\cos(4(c+dx)\right)\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^9/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] -1/192*(Sec[c + d*x]^4*((896*I)*Cos[c + d*x] + 3*((128*I)*Cos[3*(c + d*x)]
+ 105*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + 35*Cos[4*(c + d*x)]*Log[Co
s[(c + d*x)/2] - Sin[(c + d*x)/2]] + 140*Cos[2*(c + d*x)]*(Log[Cos[(c + d*x
)/2] - Sin[(c + d*x)/2]] - Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]) - 105*
Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] - 35*Cos[4*(c + d*x)]*Log[Cos[(c +
 d*x)/2] + Sin[(c + d*x)/2]] + 42*Sin[c + d*x] + 58*Sin[3*(c + d*x)])))/(a^
4*d)
```

fricas [A] time = 0.51, size = 230, normalized size = 1.73

$$\frac{105\left(e^{(8i\,dx+8i\,c)} + 4\,e^{(6i\,dx+6i\,c)} + 6\,e^{(4i\,dx+4i\,c)} + 4\,e^{(2i\,dx+2i\,c)} + 1\right)\log\left(e^{(i\,dx+i\,c)} + i\right) - 105\left(e^{(8i\,dx+8i\,c)} + 4\,e^{(6i\,dx+6i\,c)} + \right.}{24\left(a^4de^{(8i\,dx+8i\,c)} + 4\,a^4de^{(6i\,dx+6i\,c)} + \right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/24*(105*(e^(8*I*d*x + 8*I*c) + 4*e^(6*I*d*x + 6*I*c) + 6*e^(4*I*d*x + 4*I
*c) + 4*e^(2*I*d*x + 2*I*c) + 1)*log(e^(I*d*x + I*c) + I) - 105*(e^(8*I*d*x
 + 8*I*c) + 4*e^(6*I*d*x + 6*I*c) + 6*e^(4*I*d*x + 4*I*c) + 4*e^(2*I*d*x +
2*I*c) + 1)*log(e^(I*d*x + I*c) - I) - 210*I*e^(7*I*d*x + 7*I*c) - 770*I*e^
(5*I*d*x + 5*I*c) - 1022*I*e^(3*I*d*x + 3*I*c) - 558*I*e^(I*d*x + I*c))/(a^
4*d*e^(8*I*d*x + 8*I*c) + 4*a^4*d*e^(6*I*d*x + 6*I*c) + 6*a^4*d*e^(4*I*d*x
+ 4*I*c) + 4*a^4*d*e^(2*I*d*x + 2*I*c) + a^4*d)
```

giac [A] time = 2.11, size = 151, normalized size = 1.14

$$\frac{\frac{105\log\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right)}{a^4} - \frac{105\log\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right)}{a^4} - \frac{2\left(81\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^7 - 96i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^6 - 105\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5 + 480i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^4\right.}{\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1\right.}}{24\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/24*(105*log(tan(1/2*d*x + 1/2*c) + 1)/a^4 - 105*log(tan(1/2*d*x + 1/2*c)
- 1)/a^4 - 2*(81*tan(1/2*d*x + 1/2*c)^7 - 96*I*tan(1/2*d*x + 1/2*c)^6 - 105
*tan(1/2*d*x + 1/2*c)^5 + 480*I*tan(1/2*d*x + 1/2*c)^4 - 105*tan(1/2*d*x +
1/2*c)^3 - 544*I*tan(1/2*d*x + 1/2*c)^2 + 81*tan(1/2*d*x + 1/2*c) + 160*I)/
((tan(1/2*d*x + 1/2*c)^2 - 1)^4*a^4))/d
```

maple [B] time = 0.42, size = 342, normalized size = 2.57

$$\frac{1}{2a^4d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^3}+\frac{4i}{3a^4d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^3}-\frac{25}{8a^4d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2}-\frac{2i}{a^4d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^2}-\frac{}{8a^4c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 1/2/a^4/d/(tan(1/2*d*x+1/2*c)-1)^3+4/3*I/a^4/d/(tan(1/2*d*x+1/2*c)+1)^3-25/
8/a^4/d/(tan(1/2*d*x+1/2*c)-1)^2-2*I/a^4/d/(tan(1/2*d*x+1/2*c)+1)^2-27/8/a^
4/d/(tan(1/2*d*x+1/2*c)-1)-6*I/a^4/d/(tan(1/2*d*x+1/2*c)+1)+1/4/a^4/d/(tan(
1/2*d*x+1/2*c)-1)^4-35/8/d/a^4*ln(tan(1/2*d*x+1/2*c)-1)+25/8/a^4/d/(tan(1/2
*d*x+1/2*c)+1)^2-4/3*I/a^4/d/(tan(1/2*d*x+1/2*c)-1)^3+1/2/a^4/d/(tan(1/2*d*
x+1/2*c)+1)^3+6*I/a^4/d/(tan(1/2*d*x+1/2*c)-1)-27/8/a^4/d/(tan(1/2*d*x+1/2*
c)+1)-2*I/a^4/d/(tan(1/2*d*x+1/2*c)-1)^2-1/4/a^4/d/(tan(1/2*d*x+1/2*c)+1)^4
+35/8/d/a^4*ln(tan(1/2*d*x+1/2*c)+1)
```

maxima [B] time = 0.55, size = 295, normalized size = 2.22

$$-\frac{\frac{2\left(\frac{81\sin(dx+c)}{\cos(dx+c)+1}-\frac{544i\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-\frac{105\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{480i\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{105\sin(dx+c)^5}{(\cos(dx+c)+1)^5}-\frac{96i\sin(dx+c)^6}{(\cos(dx+c)+1)^6}+\frac{81\sin(dx+c)^7}{(\cos(dx+c)+1)^7}+160i\right)}{a^4-\frac{4a^4\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{6a^4\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{4a^4\sin(dx+c)^6}{(\cos(dx+c)+1)^6}+\frac{a^4\sin(dx+c)^8}{(\cos(dx+c)+1)^8}}-\frac{105\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{a^4}+}{24d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] -1/24*(2*(81*sin(d*x + c)/(cos(d*x + c) + 1) - 544*I*sin(d*x + c)^2/(cos(d*
x + c) + 1)^2 - 105*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 480*I*sin(d*x + c
)^4/(cos(d*x + c) + 1)^4 - 105*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 96*I*s
in(d*x + c)^6/(cos(d*x + c) + 1)^6 + 81*sin(d*x + c)^7/(cos(d*x + c) + 1)^7
 + 160*I)/(a^4 - 4*a^4*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 6*a^4*sin(d*x
+ c)^4/(cos(d*x + c) + 1)^4 - 4*a^4*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 + a
^4*sin(d*x + c)^8/(cos(d*x + c) + 1)^8) - 105*log(sin(d*x + c)/(cos(d*x + c
) + 1) + 1)/a^4 + 105*log(sin(d*x + c)/(cos(d*x + c) + 1) - 1)/a^4)/d
```

mupad [B] time = 6.87, size = 197, normalized size = 1.48

$$\frac{35\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{4\,a^4\,d}+\frac{\frac{35\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{4\,a^4}+\frac{35\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{4\,a^4}-\frac{27\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{4\,a^4}-\frac{27\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{4\,a^4}+\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2\,136\mathrm{i}}{3\,a^4}-\frac{\tan\left(\frac{c}{2}+\frac{d}{2}\right.}{a^4}}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8-4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6+6\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-4\tan\left(\frac{c}{2}+\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^9*(a + a*tan(c + d*x)*1i)^4),x)
```

```
[Out] (35*atanh(tan(c/2 + (d*x)/2)))/(4*a^4*d) + ((tan(c/2 + (d*x)/2)^2*136i)/(3*
a^4) + (35*tan(c/2 + (d*x)/2)^3)/(4*a^4) - (tan(c/2 + (d*x)/2)^4*40i)/a^4 +
 (35*tan(c/2 + (d*x)/2)^5)/(4*a^4) + (tan(c/2 + (d*x)/2)^6*8i)/a^4 - (27*ta
```

```
n(c/2 + (d*x)/2)^7)/(4*a^4) - 40i/(3*a^4) - (27*tan(c/2 + (d*x)/2))/(4*a^4)
)/(d*(6*tan(c/2 + (d*x)/2)^4 - 4*tan(c/2 + (d*x)/2)^2 - 4*tan(c/2 + (d*x)/2
)^6 + tan(c/2 + (d*x)/2)^8 + 1))
```

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

$$\frac{\int \frac{\sec^9(c+dx)}{\tan^4(c+dx)-4i\tan^3(c+dx)-6\tan^2(c+dx)+4i\tan(c+dx)+1}\,dx}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**9/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Integral(sec(c + d*x)**9/(tan(c + d*x)**4 - 4*I*tan(c + d*x)**3 - 6*tan(c +
 d*x)**2 + 4*I*tan(c + d*x) + 1), x)/a**4
```

3.159 $\int \frac{\sec^7(c+dx)}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=107

$$-\frac{15\tanh^{-1}(\sin(c+dx))}{2a^4d}+\frac{10i\sec^3(c+dx)}{d\left(a^4+ia^4\tan(c+dx)\right)}-\frac{15\tan(c+dx)\sec(c+dx)}{2a^4d}+\frac{2i\sec^5(c+dx)}{ad(a+ia\tan(c+dx))^3}$$

```
[Out] -15/2*arctanh(sin(d*x+c))/a^4/d-15/2*sec(d*x+c)*tan(d*x+c)/a^4/d+2*I*sec(d*
x+c)^5/a/d/(a+I*a*tan(d*x+c))^3+10*I*sec(d*x+c)^3/d/(a^4+I*a^4*tan(d*x+c))
```

Rubi [A] time = 0.10, antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3500, 3768, 3770}

$$-\frac{15\tanh^{-1}(\sin(c+dx))}{2a^4d}+\frac{10i\sec^3(c+dx)}{d\left(a^4+ia^4\tan(c+dx)\right)}-\frac{15\tan(c+dx)\sec(c+dx)}{2a^4d}+\frac{2i\sec^5(c+dx)}{ad(a+ia\tan(c+dx))^3}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^7/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (-15*ArcTanh[Sin[c + d*x]])/(2*a^4*d) - (15*Sec[c + d*x]*Tan[c + d*x])/(2*a
^4*d) + ((2*I)*Sec[c + d*x]^5)/(a*d*(a + I*a*Tan[c + d*x])^3) + ((10*I)*Sec
[c + d*x]^3)/(d*(a^4 + I*a^4*Tan[c + d*x]))
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3768

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \frac{\sec^7(c+dx)}{(a+ia\tan(c+dx))^4}\,dx = \frac{2i\sec^5(c+dx)}{ad(a+ia\tan(c+dx))^3} - \frac{5\int \frac{\sec^5(c+dx)}{(a+ia\tan(c+dx))^2}\,dx}{a^2}$$
$$= \frac{2i\sec^5(c+dx)}{ad(a+ia\tan(c+dx))^3} + \frac{10i\sec^3(c+dx)}{d\left(a^4+ia^4\tan(c+dx)\right)} - \frac{15\int \sec^3(c+dx)\,dx}{a^4}$$
$$= -\frac{15\sec(c+dx)\tan(c+dx)}{2a^4d} + \frac{2i\sec^5(c+dx)}{ad(a+ia\tan(c+dx))^3} + \frac{10i\sec^3(c+dx)}{d\left(a^4+ia^4\tan(c+dx)\right)} -$$
$$= -\frac{15\tanh^{-1}(\sin(c+dx))}{2a^4d} - \frac{15\sec(c+dx)\tan(c+dx)}{2a^4d} + \frac{2i\sec^5(c+dx)}{ad(a+ia\tan(c+dx))^3} +$$

Mathematica [B] time = 6.19, size = 988, normalized size = 9.23

$$\frac{15\cos(4c)\log\left(\cos\left(\frac{c}{2}+\frac{dx}{2}\right)-\sin\left(\frac{c}{2}+\frac{dx}{2}\right)\right)\sec^4(c+dx)(\cos(dx)+i\sin(dx))^4}{2d(i\tan(c+dx)a+a)^4} - \frac{15\cos(4c)\log\left(\cos\left(\frac{c}{2}+\frac{dx}{2}\right)+\text{s}\right.}{2d(i}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^7/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (15*Cos[4*c]*Log[Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2]]*Sec[c + d*x]^4*(C
os[d*x] + I*Sin[d*x])^4)/(2*d*(a + I*a*Tan[c + d*x])^4) - (15*Cos[4*c]*Log[
Cos[c/2 + (d*x)/2] + Sin[c/2 + (d*x)/2]]*Sec[c + d*x]^4*(Cos[d*x] + I*Sin[d
*x])^4)/(2*d*(a + I*a*Tan[c + d*x])^4) + (Cos[d*x]*Sec[c + d*x]^4*((8*I)*Co
s[3*c] - 8*Sin[3*c])*(Cos[d*x] + I*Sin[d*x])^4)/(d*(a + I*a*Tan[c + d*x])^4
) + (Sec[c]*Sec[c + d*x]^4*((4*I)*Cos[4*c] - 4*Sin[4*c])*(Cos[d*x] + I*Sin[
d*x])^4)/(d*(a + I*a*Tan[c + d*x])^4) + (((15*I)/2)*Log[Cos[c/2 + (d*x)/2]
 - Sin[c/2 + (d*x)/2]]*Sec[c + d*x]^4*Sin[4*c]*(Cos[d*x] + I*Sin[d*x])^4)/(d
*(a + I*a*Tan[c + d*x])^4) - (((15*I)/2)*Log[Cos[c/2 + (d*x)/2] + Sin[c/2 +
 (d*x)/2]]*Sec[c + d*x]^4*Sin[4*c]*(Cos[d*x] + I*Sin[d*x])^4)/(d*(a + I*a*T
an[c + d*x])^4) + (Sec[c + d*x]^4*(8*Cos[3*c] + (8*I)*Sin[3*c])*(Cos[d*x] +
 I*Sin[d*x])^4*Sin[d*x])/(d*(a + I*a*Tan[c + d*x])^4) + (Sec[c + d*x]^4*(Co
s[4*c]/4 + (I/4)*Sin[4*c])*(Cos[d*x] + I*Sin[d*x])^4)/(d*(Cos[c/2 + (d*x)/2
] - Sin[c/2 + (d*x)/2])^2*(a + I*a*Tan[c + d*x])^4) + (Sec[c + d*x]^4*(-1/4
*Cos[4*c] - (I/4)*Sin[4*c])*(Cos[d*x] + I*Sin[d*x])^4)/(d*(Cos[c/2 + (d*x)/
2] + Sin[c/2 + (d*x)/2])^2*(a + I*a*Tan[c + d*x])^4) + (4*Sec[c + d*x]^4*(C
os[d*x] + I*Sin[d*x])^4*(Cos[4*c - (d*x)/2]/2 - Cos[4*c + (d*x)/2]/2 + (I/2
)*Sin[4*c - (d*x)/2] - (I/2)*Sin[4*c + (d*x)/2]))/(d*(Cos[c/2] + Sin[c/2])*
(Cos[c/2 + (d*x)/2] + Sin[c/2 + (d*x)/2])*(a + I*a*Tan[c + d*x])^4) + (4*Se
c[c + d*x]^4*(Cos[d*x] + I*Sin[d*x])^4*(-1/2*Cos[4*c - (d*x)/2] + Cos[4*c +
 (d*x)/2]/2 - (I/2)*Sin[4*c - (d*x)/2] + (I/2)*Sin[4*c + (d*x)/2]))/(d*(Cos
[c/2] - Sin[c/2])*(Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2])*(a + I*a*Tan[c
+ d*x])^4)
```

fricas [A] time = 0.46, size = 160, normalized size = 1.50

$$-\frac{15\left(e^{(5i\,dx+5i\,c)}+2\,e^{(3i\,dx+3i\,c)}+e^{(i\,dx+i\,c)}\right)\log\left(e^{(i\,dx+i\,c)}+i\right)-15\left(e^{(5i\,dx+5i\,c)}+2\,e^{(3i\,dx+3i\,c)}+e^{(i\,dx+i\,c)}\right)\log\left(e^{(i\,dx+i\,c)}\right.}{2\left(a^4de^{(5i\,dx+5i\,c)}+2\,a^4de^{(3i\,dx+3i\,c)}+a^4de^{(i\,dx+i\,c)}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] -1/2*(15*(e^(5*I*d*x + 5*I*c) + 2*e^(3*I*d*x + 3*I*c) + e^(I*d*x + I*c))*lo
g(e^(I*d*x + I*c) + I) - 15*(e^(5*I*d*x + 5*I*c) + 2*e^(3*I*d*x + 3*I*c) +
```

```
e^(I*d*x + I*c))*log(e^(I*d*x + I*c) - I) - 30*I*e^(4*I*d*x + 4*I*c) - 50*I
*e^(2*I*d*x + 2*I*c) - 16*I)/(a^4*d*e^(5*I*d*x + 5*I*c) + 2*a^4*d*e^(3*I*d*
x + 3*I*c) + a^4*d*e^(I*d*x + I*c))
```

giac [A] time = 2.02, size = 113, normalized size = 1.06

$$-\frac{\frac{15 \log\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right)}{a^4} - \frac{15 \log\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right)}{a^4} - \frac{2\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3 - 8i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2 + \tan\left(\frac{1}{2}dx+\frac{1}{2}c\right) + 8i\right)}{\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1\right)^2 a^4} - \frac{32}{a^4\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-i\right)}}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] -1/2*(15*log(tan(1/2*d*x + 1/2*c) + 1)/a^4 - 15*log(tan(1/2*d*x + 1/2*c) -
1)/a^4 - 2*(tan(1/2*d*x + 1/2*c)^3 - 8*I*tan(1/2*d*x + 1/2*c)^2 + tan(1/2*d
*x + 1/2*c) + 8*I)/((tan(1/2*d*x + 1/2*c)^2 - 1)^2*a^4) - 32/(a^4*(tan(1/2*
d*x + 1/2*c) - I)))/d
```

maple [A] time = 0.42, size = 192, normalized size = 1.79

$$\frac{1}{2a^4 d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)} - \frac{4i}{a^4 d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)} + \frac{1}{2a^4 d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2} + \frac{15\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{2d\,a^4} + \frac{}{2a^4 d\left(\mathrm{t}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 1/2/a^4/d/(tan(1/2*d*x+1/2*c)-1)-4*I/a^4/d/(tan(1/2*d*x+1/2*c)-1)+1/2/a^4/d
/(tan(1/2*d*x+1/2*c)-1)^2+15/2/d/a^4*ln(tan(1/2*d*x+1/2*c)-1)+1/2/a^4/d/(ta
n(1/2*d*x+1/2*c)+1)+4*I/a^4/d/(tan(1/2*d*x+1/2*c)+1)-1/2/a^4/d/(tan(1/2*d*x
+1/2*c)+1)^2-15/2/d/a^4*ln(tan(1/2*d*x+1/2*c)+1)+16/a^4/d/(tan(1/2*d*x+1/2*
c)-I)
```

maxima [B] time = 0.96, size = 467, normalized size = 4.36

$$\frac{(30\cos(5\,dx+5\,c)+60\cos(3\,dx+3\,c)+30\cos(dx+c)+30i\sin(5\,dx+5\,c)+60i\sin(3\,dx+3\,c)+30i\,\mathrm{s}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] ((30*cos(5*d*x + 5*c) + 60*cos(3*d*x + 3*c) + 30*cos(d*x + c) + 30*I*sin(5*
d*x + 5*c) + 60*I*sin(3*d*x + 3*c) + 30*I*sin(d*x + c))*arctan2(cos(d*x + c
), sin(d*x + c) + 1) + (30*cos(5*d*x + 5*c) + 60*cos(3*d*x + 3*c) + 30*cos(
d*x + c) + 30*I*sin(5*d*x + 5*c) + 60*I*sin(3*d*x + 3*c) + 30*I*sin(d*x + c
))*arctan2(cos(d*x + c), -sin(d*x + c) + 1) - (-15*I*cos(5*d*x + 5*c) - 30*
I*cos(3*d*x + 3*c) - 15*I*cos(d*x + c) + 15*sin(5*d*x + 5*c) + 30*sin(3*d*x
 + 3*c) + 15*sin(d*x + c))*log(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*sin(d*x
+ c) + 1) - (15*I*cos(5*d*x + 5*c) + 30*I*cos(3*d*x + 3*c) + 15*I*cos(d*x +
 c) - 15*sin(5*d*x + 5*c) - 30*sin(3*d*x + 3*c) - 15*sin(d*x + c))*log(cos(
d*x + c)^2 + sin(d*x + c)^2 - 2*sin(d*x + c) + 1) + 60*cos(4*d*x + 4*c) + 1
00*cos(2*d*x + 2*c) + 60*I*sin(4*d*x + 4*c) + 100*I*sin(2*d*x + 2*c) + 32)/
((-4*I*a^4*cos(5*d*x + 5*c) - 8*I*a^4*cos(3*d*x + 3*c) - 4*I*a^4*cos(d*x +
c) + 4*a^4*sin(5*d*x + 5*c) + 8*a^4*sin(3*d*x + 3*c) + 4*a^4*sin(d*x + c))*
d)
```

mupad [B] time = 5.52, size = 162, normalized size = 1.51

$$-\frac{15\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{a^4\,d}+\frac{\frac{9\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{a^4}-\frac{7\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{a^4}-\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2\,39\mathrm{i}}{a^4}+\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4\,17\mathrm{i}}{a^4}+\frac{24\mathrm{i}}{a^4}}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5\,1\mathrm{i}+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3\,2\mathrm{i}-2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+\tan\left(\frac{c}{2}+\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^7*(a + a*tan(c + d*x)*1i)^4),x)
```

```
[Out] ((9*tan(c/2 + (d*x)/2)^3)/a^4 - (tan(c/2 + (d*x)/2)^2*39i)/a^4 + (tan(c/2 +
 (d*x)/2)^4*17i)/a^4 + 24i/a^4 - (7*tan(c/2 + (d*x)/2))/a^4)/(d*(tan(c/2 +
(d*x)/2)*1i - 2*tan(c/2 + (d*x)/2)^2 - tan(c/2 + (d*x)/2)^3*2i + tan(c/2 +
(d*x)/2)^4 + tan(c/2 + (d*x)/2)^5*1i + 1)) - (15*atanh(tan(c/2 + (d*x)/2)))
/(a^4*d)
```

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

$$\frac{\int \frac{\sec^7(c+dx)}{\tan^4(c+dx)-4i\tan^3(c+dx)-6\tan^2(c+dx)+4i\tan(c+dx)+1}\,dx}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**7/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Integral(sec(c + d*x)**7/(tan(c + d*x)**4 - 4*I*tan(c + d*x)**3 - 6*tan(c +
 d*x)**2 + 4*I*tan(c + d*x) + 1), x)/a**4
```

3.160 $\int \frac{\sec^5(c+dx)}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=82

$$\frac{\tanh^{-1}(\sin(c+dx))}{a^4d}-\frac{2i\sec(c+dx)}{d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{2i\sec^3(c+dx)}{3ad(a+ia\tan(c+dx))^3}$$

```
[Out] arctanh(sin(d*x+c))/a^4/d+2/3*I*sec(d*x+c)^3/a/d/(a+I*a*tan(d*x+c))^3-2*I*s
ec(d*x+c)/d/(a^4+I*a^4*tan(d*x+c))
```

Rubi [A] time = 0.09, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3500, 3770}

$$\frac{\tanh^{-1}(\sin(c+dx))}{a^4d}-\frac{2i\sec(c+dx)}{d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{2i\sec^3(c+dx)}{3ad(a+ia\tan(c+dx))^3}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^5/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] ArcTanh[Sin[c + d*x]]/(a^4*d) + (((2*I)/3)*Sec[c + d*x]^3)/(a*d*(a + I*a*Ta
n[c + d*x])^3) - ((2*I)*Sec[c + d*x])/(d*(a^4 + I*a^4*Tan[c + d*x]))
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^5(c+dx)}{(a+ia\tan(c+dx))^4}\,dx &= \frac{2i\sec^3(c+dx)}{3ad(a+ia\tan(c+dx))^3}-\frac{\int \frac{\sec^3(c+dx)}{(a+ia\tan(c+dx))^2}\,dx}{a^2}\\ &= \frac{2i\sec^3(c+dx)}{3ad(a+ia\tan(c+dx))^3}-\frac{2i\sec(c+dx)}{d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{\int \sec(c+dx)\,dx}{a^4}\\ &= \frac{\tanh^{-1}(\sin(c+dx))}{a^4d}+\frac{2i\sec^3(c+dx)}{3ad(a+ia\tan(c+dx))^3}-\frac{2i\sec(c+dx)}{d\left(a^4+ia^4\tan(c+dx)\right)}\end{aligned}$$

Mathematica [B] time = 0.31, size = 247, normalized size = 3.01

$$\sec^4(c+dx)(\cos(dx)+i\sin(dx))^4\left(-6i\sin(3c)\sin(dx)+2i\sin(c)\sin(3dx)-2\sin(c)\cos(3dx)+6\sin(3c)\cos\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^5/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (Sec[c + d*x]^4*(Cos[d*x] + I*Sin[d*x])^4*(-3*Cos[4*c]*Log[Cos[(c + d*x)/2]
 - Sin[(c + d*x)/2]] + 3*Cos[4*c]*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]
- 2*Cos[3*d*x]*Sin[c] + 6*Cos[d*x]*Sin[3*c] - (3*I)*Log[Cos[(c + d*x)/2] -
Sin[(c + d*x)/2]]*Sin[4*c] + (3*I)*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]
*Sin[4*c] + Cos[3*c]*((-6*I)*Cos[d*x] - 6*Sin[d*x]) - (6*I)*Sin[3*c]*Sin[d*
x] + (2*I)*Sin[c]*Sin[3*d*x] + 2*Cos[c]*(I*Cos[3*d*x] + Sin[3*d*x])))/(3*a^
4*d*(-I + Tan[c + d*x])^4)
```

fricas [A] time = 0.52, size = 76, normalized size = 0.93

$$\frac{\left(3\,e^{(3i\,dx+3i\,c)}\log\left(e^{(i\,dx+i\,c)}+i\right)-3\,e^{(3i\,dx+3i\,c)}\log\left(e^{(i\,dx+i\,c)}-i\right)-6i\,e^{(2i\,dx+2i\,c)}+2i\right)e^{(-3i\,dx-3i\,c)}}{3\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

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

giac [A] time = 1.71, size = 71, normalized size = 0.87

$$\frac{\frac{3\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^4}-\frac{3\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)}{a^4}+\frac{8\left(3i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^4\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)^3}}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/3*(3*log(tan(1/2*d*x + 1/2*c) + 1)/a^4 - 3*log(tan(1/2*d*x + 1/2*c) - 1)/
a^4 + 8*(3*I*tan(1/2*d*x + 1/2*c) + 1)/(a^4*(tan(1/2*d*x + 1/2*c) - I)^3))/
d
```

maple [A] time = 0.47, size = 86, normalized size = 1.05

$$-\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{d\,a^4}+\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{d\,a^4}+\frac{8i}{a^4d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^2}-\frac{16}{3a^4d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] -1/d/a^4*ln(tan(1/2*d*x+1/2*c)-1)+1/d/a^4*ln(tan(1/2*d*x+1/2*c)+1)+8*I/a^4/
d/(tan(1/2*d*x+1/2*c)-I)^2-16/3/a^4/d/(tan(1/2*d*x+1/2*c)-I)^3
```

maxima [A] time = 0.55, size = 141, normalized size = 1.72

$$\frac{-6i\,\arctan\left(\cos\left(dx+c\right),\sin\left(dx+c\right)+1\right)-6i\,\arctan\left(\cos\left(dx+c\right),-\sin\left(dx+c\right)+1\right)+4i\,\cos\left(3\,dx+3\,c\right)-12}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] 1/6*(-6*I*arctan2(cos(d*x + c), sin(d*x + c) + 1) - 6*I*arctan2(cos(d*x + c
), -sin(d*x + c) + 1) + 4*I*cos(3*d*x + 3*c) - 12*I*cos(d*x + c) + 3*log(co
s(d*x + c)^2 + sin(d*x + c)^2 + 2*sin(d*x + c) + 1) - 3*log(cos(d*x + c)^2
+ sin(d*x + c)^2 - 2*sin(d*x + c) + 1) + 4*sin(3*d*x + 3*c) - 12*sin(d*x +
c))/(a^4*d)
```

mupad [B] time = 3.68, size = 88, normalized size = 1.07

$$\frac{2\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{a^4\,d}-\frac{-\frac{8\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{a^4}+\frac{8\mathrm{i}}{3\,a^4}}{d\,\left(-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3\,1\mathrm{i}-3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,3\mathrm{i}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^4),x)
```

```
[Out] (2*atanh(tan(c/2 + (d*x)/2)))/(a^4*d) - (8i/(3*a^4) - (8*tan(c/2 + (d*x)/2)
)/a^4)/(d*(tan(c/2 + (d*x)/2)*3i - 3*tan(c/2 + (d*x)/2)^2 - tan(c/2 + (d*x)
/2)^3*1i + 1))
```

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

$$\frac{\int \frac{\sec^5(c+dx)}{\tan^4(c+dx)-4i\tan^3(c+dx)-6\tan^2(c+dx)+4i\tan(c+dx)+1}\,dx}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**5/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Integral(sec(c + d*x)**5/(tan(c + d*x)**4 - 4*I*tan(c + d*x)**3 - 6*tan(c +
 d*x)**2 + 4*I*tan(c + d*x) + 1), x)/a**4
```

3.161 $\int \frac{\sec^3(c+dx)}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=68

$$\frac{i\sec^3(c+dx)}{15ad(a+ia\tan(c+dx))^3}+\frac{i\sec^3(c+dx)}{5d(a+ia\tan(c+dx))^4}$$

```
[Out] 1/5*I*sec(d*x+c)^3/d/(a+I*a*tan(d*x+c))^4+1/15*I*sec(d*x+c)^3/a/d/(a+I*a*ta
n(d*x+c))^3
```

Rubi [A] time = 0.08, antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {3502, 3488}

$$\frac{i\sec^3(c+dx)}{15ad(a+ia\tan(c+dx))^3}+\frac{i\sec^3(c+dx)}{5d(a+ia\tan(c+dx))^4}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] ((I/5)*Sec[c + d*x]^3)/(d*(a + I*a*Tan[c + d*x])^4) + ((I/15)*Sec[c + d*x]^
3)/(a*d*(a + I*a*Tan[c + d*x])^3)
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3502

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

Rubi steps

$$\begin{aligned}\int \frac{\sec^3(c+dx)}{(a+ia\tan(c+dx))^4}\,dx &= \frac{i\sec^3(c+dx)}{5d(a+ia\tan(c+dx))^4}+\frac{\int \frac{\sec^3(c+dx)}{(a+ia\tan(c+dx))^3}\,dx}{5a}\\ &= \frac{i\sec^3(c+dx)}{5d(a+ia\tan(c+dx))^4}+\frac{i\sec^3(c+dx)}{15ad(a+ia\tan(c+dx))^3}\end{aligned}$$

Mathematica [A] time = 0.10, size = 40, normalized size = 0.59

$$-\frac{(\tan(c+dx)-4i)\sec^3(c+dx)}{15a^4d(\tan(c+dx)-i)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^3/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] -1/15*(Sec[c + d*x]^3*(-4*I + Tan[c + d*x]))/(a^4*d*(-I + Tan[c + d*x])^4)
```

fricas [A] time = 0.56, size = 30, normalized size = 0.44

$$\frac{\left(5i\,e^{(2i\,dx+2i\,c)}+3i\right)e^{(-5i\,dx-5i\,c)}}{30\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/30*(5*I*e^(2*I*d*x + 2*I*c) + 3*I)*e^(-5*I*d*x - 5*I*c)/(a^4*d)
```

giac [A] time = 1.60, size = 73, normalized size = 1.07

$$\frac{2\left(15\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^4-15i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3-25\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+5i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+4\right)}{15\,a^4d\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 2/15*(15*tan(1/2*d*x + 1/2*c)^4 - 15*I*tan(1/2*d*x + 1/2*c)^3 - 25*tan(1/2*
d*x + 1/2*c)^2 + 5*I*tan(1/2*d*x + 1/2*c) + 4)/(a^4*d*(tan(1/2*d*x + 1/2*c)
 - I)^5)
```

maple [A] time = 0.47, size = 90, normalized size = 1.32

$$\frac{\frac{6i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^2}-\frac{8i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^4}+\frac{2}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i}-\frac{28}{3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^3}+\frac{16}{5\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^5}}{a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 2/d/a^4*(3*I/(tan(1/2*d*x+1/2*c)-I)^2-4*I/(tan(1/2*d*x+1/2*c)-I)^4+1/(tan(1
/2*d*x+1/2*c)-I)-14/3/(tan(1/2*d*x+1/2*c)-I)^3+8/5/(tan(1/2*d*x+1/2*c)-I)^5
)
```

maxima [A] time = 0.37, size = 53, normalized size = 0.78

$$\frac{3i\,\cos\left(5\,dx+5\,c\right)+5i\,\cos\left(3\,dx+3\,c\right)+3\,\sin\left(5\,dx+5\,c\right)+5\,\sin\left(3\,dx+3\,c\right)}{30\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] 1/30*(3*I*cos(5*d*x + 5*c) + 5*I*cos(3*d*x + 3*c) + 3*sin(5*d*x + 5*c) + 5*
sin(3*d*x + 3*c))/(a^4*d)
```

mupad [B] time = 3.66, size = 133, normalized size = 1.96

$$\frac{2\,\left({\mathrm{tan}\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^4\,15{}\mathrm{i}+15\,{\mathrm{tan}\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^3-{\mathrm{tan}\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^2\,25{}\mathrm{i}-5\,\mathrm{tan}\left(\frac{c}{2}+\frac{d\,x}{2}\right)+4{}\mathrm{i}\right)}{15\,a^4\,d\,\left({\mathrm{tan}\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^5\,1{}\mathrm{i}+5\,{\mathrm{tan}\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^4-{\mathrm{tan}\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^3\,10{}\mathrm{i}-10\,{\mathrm{tan}\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^2+\mathrm{tan}\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,5{}\mathrm{i}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^4),x)
```

```
[Out] (2*(15*tan(c/2 + (d*x)/2)^3 - tan(c/2 + (d*x)/2)^2*25i - 5*tan(c/2 + (d*x)/
2) + tan(c/2 + (d*x)/2)^4*15i + 4i))/(15*a^4*d*(tan(c/2 + (d*x)/2)*5i - 10*
tan(c/2 + (d*x)/2)^2 - tan(c/2 + (d*x)/2)^3*10i + 5*tan(c/2 + (d*x)/2)^4 +
tan(c/2 + (d*x)/2)^5*1i + 1))
```

sympy [A] time = 3.85, size = 182, normalized size = 2.68

$$\begin{cases} -\frac{\tan(c+dx)\sec^3(c+dx)}{15a^4d\tan^4(c+dx)-60ia^4d\tan^3(c+dx)-90a^4d\tan^2(c+dx)+60ia^4d\tan(c+dx)+15a^4d} + \frac{4i\sec^3(c+dx)}{15a^4d\tan^4(c+dx)-60ia^4d\tan^3(c+dx)-90a^4d\tan^2(c+dx)-} \\ \frac{x\sec^3(c)}{(ia\tan(c)+a)^4} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Piecewise((-tan(c + d*x)*sec(c + d*x)**3/(15*a**4*d*tan(c + d*x)**4 - 60*I*
a**4*d*tan(c + d*x)**3 - 90*a**4*d*tan(c + d*x)**2 + 60*I*a**4*d*tan(c + d*
x) + 15*a**4*d) + 4*I*sec(c + d*x)**3/(15*a**4*d*tan(c + d*x)**4 - 60*I*a**
4*d*tan(c + d*x)**3 - 90*a**4*d*tan(c + d*x)**2 + 60*I*a**4*d*tan(c + d*x)
+ 15*a**4*d), Ne(d, 0)), (x*sec(c)**3/(I*a*tan(c) + a)**4, True))
```

3.162 $\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=132

$$\frac{2i\sec(c+dx)}{35d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{2i\sec(c+dx)}{35d\left(a^2+ia^2\tan(c+dx)\right)^2}+\frac{3i\sec(c+dx)}{35ad(a+ia\tan(c+dx))^3}+\frac{i\sec(c+dx)}{7d(a+ia\tan(c+dx))^4}$$

```
[Out] 1/7*I*sec(d*x+c)/d/(a+I*a*tan(d*x+c))^4+3/35*I*sec(d*x+c)/a/d/(a+I*a*tan(d*
x+c))^3+2/35*I*sec(d*x+c)/d/(a^2+I*a^2*tan(d*x+c))^2+2/35*I*sec(d*x+c)/d/(a
^4+I*a^4*tan(d*x+c))
```

Rubi [A] time = 0.11, antiderivative size = 132, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {3502, 3488}

$$\frac{2i\sec(c+dx)}{35d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{2i\sec(c+dx)}{35d\left(a^2+ia^2\tan(c+dx)\right)^2}+\frac{3i\sec(c+dx)}{35ad(a+ia\tan(c+dx))^3}+\frac{i\sec(c+dx)}{7d(a+ia\tan(c+dx))^4}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] ((I/7)*Sec[c + d*x])/(d*(a + I*a*Tan[c + d*x])^4) + (((3*I)/35)*Sec[c + d*x
])/(a*d*(a + I*a*Tan[c + d*x])^3) + (((2*I)/35)*Sec[c + d*x])/(d*(a^2 + I*a
^2*Tan[c + d*x])^2) + (((2*I)/35)*Sec[c + d*x])/(d*(a^4 + I*a^4*Tan[c + d*x
]))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3502

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

Rubi steps

$$\begin{aligned}
\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^4}\,dx &= \frac{i\sec(c+dx)}{7d(a+ia\tan(c+dx))^4}+\frac{3\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^3}\,dx}{7a}\\
&= \frac{i\sec(c+dx)}{7d(a+ia\tan(c+dx))^4}+\frac{3i\sec(c+dx)}{35ad(a+ia\tan(c+dx))^3}+\frac{6\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^2}\,dx}{35a^2}\\
&= \frac{i\sec(c+dx)}{7d(a+ia\tan(c+dx))^4}+\frac{3i\sec(c+dx)}{35ad(a+ia\tan(c+dx))^3}+\frac{2i\sec(c+dx)}{35d\left(a^2+ia^2\tan(c+dx)\right)}\\
&= \frac{i\sec(c+dx)}{7d(a+ia\tan(c+dx))^4}+\frac{3i\sec(c+dx)}{35ad(a+ia\tan(c+dx))^3}+\frac{2i\sec(c+dx)}{35d\left(a^2+ia^2\tan(c+dx)\right)}
\end{aligned}$$

Mathematica [A] time = 0.22, size = 73, normalized size = 0.55

$$\frac{i\sec^4(c+dx)(7i\sin(c+dx)+15i\sin(3(c+dx))+28\cos(c+dx)+20\cos(3(c+dx)))}{140a^4d(\tan(c+dx)-i)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] ((I/140)*Sec[c + d*x]^4*(28*Cos[c + d*x] + 20*Cos[3*(c + d*x)] + (7*I)*Sin[
c + d*x] + (15*I)*Sin[3*(c + d*x)]))/(a^4*d*(-I + Tan[c + d*x])^4)
```

fricas [A] time = 0.54, size = 52, normalized size = 0.39

$$\frac{\left(35i\,e^{(6i\,dx+6i\,c)}+35i\,e^{(4i\,dx+4i\,c)}+21i\,e^{(2i\,dx+2i\,c)}+5i\right)e^{(-7i\,dx-7i\,c)}}{280\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/280*(35*I*e^(6*I*d*x + 6*I*c) + 35*I*e^(4*I*d*x + 4*I*c) + 21*I*e^(2*I*d*
x + 2*I*c) + 5*I)*e^(-7*I*d*x - 7*I*c)/(a^4*d)
```

giac [A] time = 1.95, size = 99, normalized size = 0.75

$$\frac{2\left(35\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^6-105i\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-210\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^4+210i\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+147\tan\left(\frac{1}{2}\,d\right.}{35\,a^4d\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 2/35*(35*tan(1/2*d*x + 1/2*c)^6 - 105*I*tan(1/2*d*x + 1/2*c)^5 - 210*tan(1/
2*d*x + 1/2*c)^4 + 210*I*tan(1/2*d*x + 1/2*c)^3 + 147*tan(1/2*d*x + 1/2*c)^
2 - 49*I*tan(1/2*d*x + 1/2*c) - 12)/(a^4*d*(tan(1/2*d*x + 1/2*c) - I)^7)
```

maple [A] time = 0.23, size = 123, normalized size = 0.93

$$\frac{\frac{2}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i}+\frac{72}{5\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^5}-\frac{16}{7\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^7}-\frac{16i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^4}+\frac{6i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^2}-\frac{12}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^3}+\frac{8i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^6}}{d\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 2/d/a^4*(1/(tan(1/2*d*x+1/2*c)-I)+36/5/(tan(1/2*d*x+1/2*c)-I)^5-8/7/(tan(1/
2*d*x+1/2*c)-I)^7-8*I/(tan(1/2*d*x+1/2*c)-I)^4+3*I/(tan(1/2*d*x+1/2*c)-I)^2
-6/(tan(1/2*d*x+1/2*c)-I)^3+4*I/(tan(1/2*d*x+1/2*c)-I)^6)
```

maxima [A] time = 0.44, size = 91, normalized size = 0.69

$$\frac{5i\cos\left(7\,dx+7\,c\right)+21i\cos\left(5\,dx+5\,c\right)+35i\cos\left(3\,dx+3\,c\right)+35i\cos\left(dx+c\right)+5\sin\left(7\,dx+7\,c\right)+21\sin\left(5\right.}{280\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] 1/280*(5*I*cos(7*d*x + 7*c) + 21*I*cos(5*d*x + 5*c) + 35*I*cos(3*d*x + 3*c)
 + 35*I*cos(d*x + c) + 5*sin(7*d*x + 7*c) + 21*sin(5*d*x + 5*c) + 35*sin(3*
d*x + 3*c) + 35*sin(d*x + c))/(a^4*d)
```

mupad [B] time = 3.74, size = 64, normalized size = 0.48

$$\frac{\frac{\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\,1\mathrm{i}}{8}+\frac{\mathrm{e}^{-c\,3\mathrm{i}-d\,x\,3\mathrm{i}}\,1\mathrm{i}}{8}+\frac{\mathrm{e}^{-c\,5\mathrm{i}-d\,x\,5\mathrm{i}}\,3\mathrm{i}}{40}+\frac{\mathrm{e}^{-c\,7\mathrm{i}-d\,x\,7\mathrm{i}}\,1\mathrm{i}}{56}}{a^4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^4),x)
```

```
[Out] ((exp(- c*1i - d*x*1i)*1i)/8 + (exp(- c*3i - d*x*3i)*1i)/8 + (exp(- c*5i -
d*x*5i)*3i)/40 + (exp(- c*7i - d*x*7i)*1i)/56)/(a^4*d)
```

sympy [A] time = 3.90, size = 354, normalized size = 2.68

$$\begin{cases} \frac{2\tan^3(c+dx)\sec(c+dx)}{35a^4d\tan^4(c+dx)-140ia^4d\tan^3(c+dx)-210a^4d\tan^2(c+dx)+140ia^4d\tan(c+dx)+35a^4d} - \frac{8i\tan^2(c+dx)\sec(c+}{35a^4d\tan^4(c+dx)-140ia^4d\tan^3(c+dx)-210a^4d\tan^2} \\ \frac{x\sec(c)}{(ia\tan(c)+a)^4} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Piecewise((2*tan(c + d*x)**3*sec(c + d*x)/(35*a**4*d*tan(c + d*x)**4 - 140*
I*a**4*d*tan(c + d*x)**3 - 210*a**4*d*tan(c + d*x)**2 + 140*I*a**4*d*tan(c
+ d*x) + 35*a**4*d) - 8*I*tan(c + d*x)**2*sec(c + d*x)/(35*a**4*d*tan(c + d
*x)**4 - 140*I*a**4*d*tan(c + d*x)**3 - 210*a**4*d*tan(c + d*x)**2 + 140*I*
a**4*d*tan(c + d*x) + 35*a**4*d) - 13*tan(c + d*x)*sec(c + d*x)/(35*a**4*d*
tan(c + d*x)**4 - 140*I*a**4*d*tan(c + d*x)**3 - 210*a**4*d*tan(c + d*x)**2
 + 140*I*a**4*d*tan(c + d*x) + 35*a**4*d) + 12*I*sec(c + d*x)/(35*a**4*d*ta
n(c + d*x)**4 - 140*I*a**4*d*tan(c + d*x)**3 - 210*a**4*d*tan(c + d*x)**2 +
 140*I*a**4*d*tan(c + d*x) + 35*a**4*d), Ne(d, 0)), (x*sec(c)/(I*a*tan(c) +
 a)**4, True))
```

3.163 $\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=134

$$-\frac{4\sin^3(c+dx)}{63a^4d}+\frac{4\sin(c+dx)}{21a^4d}+\frac{8i\cos^3(c+dx)}{63d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{5i\cos(c+dx)}{63ad(a+ia\tan(c+dx))^3}+\frac{i\cos(c+dx)}{9d(a+ia\tan(c+dx))^4}$$

```
[Out] 4/21*sin(d*x+c)/a^4/d-4/63*sin(d*x+c)^3/a^4/d+1/9*I*cos(d*x+c)/d/(a+I*a*tan
(d*x+c))^4+5/63*I*cos(d*x+c)/a/d/(a+I*a*tan(d*x+c))^3+8/63*I*cos(d*x+c)^3/d
/(a^4+I*a^4*tan(d*x+c))
```

Rubi [A] time = 0.12, antiderivative size = 134, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {3502, 3500, 2633}

$$-\frac{4\sin^3(c+dx)}{63a^4d}+\frac{4\sin(c+dx)}{21a^4d}+\frac{8i\cos^3(c+dx)}{63d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{5i\cos(c+dx)}{63ad(a+ia\tan(c+dx))^3}+\frac{i\cos(c+dx)}{9d(a+ia\tan(c+dx))^4}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (4*Sin[c + d*x])/(21*a^4*d) - (4*Sin[c + d*x]^3)/(63*a^4*d) + ((I/9)*Cos[c
+ d*x])/(d*(a + I*a*Tan[c + d*x])^4) + (((5*I)/63)*Cos[c + d*x])/(a*d*(a +
I*a*Tan[c + d*x])^3) + (((8*I)/63)*Cos[c + d*x]^3)/(d*(a^4 + I*a^4*Tan[c +
d*x]))
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3502

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

Rubi steps

$$\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^4}\,dx = \frac{i\cos(c+dx)}{9d(a+ia\tan(c+dx))^4} + \frac{5\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^3}\,dx}{9a}$$
$$= \frac{i\cos(c+dx)}{9d(a+ia\tan(c+dx))^4} + \frac{5i\cos(c+dx)}{63ad(a+ia\tan(c+dx))^3} + \frac{20\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^2}\,dx}{63a^2}$$
$$= \frac{i\cos(c+dx)}{9d(a+ia\tan(c+dx))^4} + \frac{5i\cos(c+dx)}{63ad(a+ia\tan(c+dx))^3} + \frac{8i\cos^3(c+dx)}{63d\left(a^4+ia^4\tan(c+dx)\right)}$$
$$= \frac{i\cos(c+dx)}{9d(a+ia\tan(c+dx))^4} + \frac{5i\cos(c+dx)}{63ad(a+ia\tan(c+dx))^3} + \frac{8i\cos^3(c+dx)}{63d\left(a^4+ia^4\tan(c+dx)\right)}$$
$$= \frac{4\sin(c+dx)}{21a^4d} - \frac{4\sin^3(c+dx)}{63a^4d} + \frac{i\cos(c+dx)}{9d(a+ia\tan(c+dx))^4} + \frac{5i\cos(c+dx)}{63ad(a+ia\tan(c+a}$$

Mathematica [A] time = 0.24, size = 95, normalized size = 0.71

$$-\frac{i\sec^4(c+dx)(-42i\sin(c+dx)-135i\sin(3(c+dx))+35i\sin(5(c+dx))-168\cos(c+dx)-180\cos(3(c+a}{1008a^4d(\tan(c+dx)-i)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] ((-1/1008*I)*Sec[c + d*x]^4*(-168*Cos[c + d*x] - 180*Cos[3*(c + d*x)] + 28*
Cos[5*(c + d*x)] - (42*I)*Sin[c + d*x] - (135*I)*Sin[3*(c + d*x)] + (35*I)*
Sin[5*(c + d*x)]))/(a^4*d*(-I + Tan[c + d*x])^4)
```

fricas [A] time = 0.53, size = 74, normalized size = 0.55

$$\frac{\left(-63i\,e^{(10i\,dx+10i\,c)}+315i\,e^{(8i\,dx+8i\,c)}+210i\,e^{(6i\,dx+6i\,c)}+126i\,e^{(4i\,dx+4i\,c)}+45i\,e^{(2i\,dx+2i\,c)}+7i\right)e^{(-9i\,dx-9i\,c)}}{2016\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/2016*(-63*I*e^(10*I*d*x + 10*I*c) + 315*I*e^(8*I*d*x + 8*I*c) + 210*I*e^(
6*I*d*x + 6*I*c) + 126*I*e^(4*I*d*x + 4*I*c) + 45*I*e^(2*I*d*x + 2*I*c) + 7
*I)*e^(-9*I*d*x - 9*I*c)/(a^4*d)
```

giac [A] time = 2.29, size = 145, normalized size = 1.08

$$\frac{\frac{63}{a^4\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+i\right)} + \frac{1953\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^8-9450i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7-25998\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^6+42210i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5+46368\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^4-}{a^4\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)^9}}{1008\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/1008*(63/(a^4*(tan(1/2*d*x + 1/2*c) + I)) + (1953*tan(1/2*d*x + 1/2*c)^8
- 9450*I*tan(1/2*d*x + 1/2*c)^7 - 25998*tan(1/2*d*x + 1/2*c)^6 + 42210*I*ta
n(1/2*d*x + 1/2*c)^5 + 46368*tan(1/2*d*x + 1/2*c)^4 - 33054*I*tan(1/2*d*x +
 1/2*c)^3 - 15858*tan(1/2*d*x + 1/2*c)^2 + 4374*I*tan(1/2*d*x + 1/2*c) + 70
3)/(a^4*(tan(1/2*d*x + 1/2*c) - I)^9))/d
```

maple [A] time = 0.43, size = 174, normalized size = 1.30

$$\frac{\frac{2}{32\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+32i}+\frac{86i}{3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{6}}-\frac{8i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{8}}-\frac{49i}{2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{4}}+\frac{49i}{8\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{2}}+\frac{16}{9\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{9}}-\frac{132}{7\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right.}}{d\,a^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 2/d/a^4*(1/32/(tan(1/2*d*x+1/2*c)+I)+43/3*I/(tan(1/2*d*x+1/2*c)-I)^6-4*I/(t
an(1/2*d*x+1/2*c)-I)^8-49/4*I/(tan(1/2*d*x+1/2*c)-I)^4+49/16*I/(tan(1/2*d*x
+1/2*c)-I)^2+8/9/(tan(1/2*d*x+1/2*c)-I)^9-66/7/(tan(1/2*d*x+1/2*c)-I)^7+31/
2/(tan(1/2*d*x+1/2*c)-I)^5-173/24/(tan(1/2*d*x+1/2*c)-I)^3+31/32/(tan(1/2*d
*x+1/2*c)-I))
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 7.41, size = 161, normalized size = 1.20

$$\frac{\left(63\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8 252\mathrm{i}-588\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6 672\mathrm{i}+378\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5+\tan\left(\frac{c}{2}\right.\right.}{63\,a^4\,d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+1\mathrm{i}\right)\,\left(1+\tan\left(\frac{c}{2}\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)/(a + a*tan(c + d*x)*1i)^4,x)
```

```
[Out] ((372*tan(c/2 + (d*x)/2)^3 - tan(c/2 + (d*x)/2)^2*288i - 97*tan(c/2 + (d*x)
/2) + tan(c/2 + (d*x)/2)^4*168i + 378*tan(c/2 + (d*x)/2)^5 + tan(c/2 + (d*x
)/2)^6*672i - 588*tan(c/2 + (d*x)/2)^7 - tan(c/2 + (d*x)/2)^8*252i + 63*tan
(c/2 + (d*x)/2)^9 + 20i)*2i)/(63*a^4*d*(tan(c/2 + (d*x)/2) + 1i)*(tan(c/2 +
 (d*x)/2)*1i + 1)^9)
```

sympy [A] time = 0.64, size = 233, normalized size = 1.74

$$\begin{cases}\frac{\left(-1585446912ia^{20}d^{5}e^{26ic}e^{idx}+7927234560ia^{20}d^{5}e^{24ic}e^{-idx}+5284823040ia^{20}d^{5}e^{22ic}e^{-3idx}+3170893824ia^{20}d^{5}e^{20ic}e^{-5idx}+1132462080ia^{20}d^{5}e^{18ic}e^{-7idx}\right.}{50734301184a^{24}d^{6}} \\ \frac{x\left(e^{10ic}+5e^{8ic}+10e^{6ic}+10e^{4ic}+5e^{2ic}+1\right)e^{-9ic}}{32a^{4}}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Piecewise(((-1585446912*I*a**20*d**5*exp(26*I*c)*exp(I*d*x) + 7927234560*I*
a**20*d**5*exp(24*I*c)*exp(-I*d*x) + 5284823040*I*a**20*d**5*exp(22*I*c)*ex
p(-3*I*d*x) + 3170893824*I*a**20*d**5*exp(20*I*c)*exp(-5*I*d*x) + 113246208
0*I*a**20*d**5*exp(18*I*c)*exp(-7*I*d*x) + 176160768*I*a**20*d**5*exp(16*I*
c)*exp(-9*I*d*x))*exp(-25*I*c)/(50734301184*a**24*d**6), Ne(50734301184*a**
24*d**6*exp(25*I*c), 0)), (x*(exp(10*I*c) + 5*exp(8*I*c) + 10*exp(6*I*c) +
10*exp(4*I*c) + 5*exp(2*I*c) + 1)*exp(-9*I*c)/(32*a**4), True))
```

3.164 $\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx))^4} dx$

Optimal. Leaf size=156

$$\frac{2\sin^5(c+dx)}{33a^4d}-\frac{20\sin^3(c+dx)}{99a^4d}+\frac{10\sin(c+dx)}{33a^4d}+\frac{4i\cos^5(c+dx)}{33d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{7i\cos^3(c+dx)}{99ad(a+ia\tan(c+dx))^3}+\frac{}{11d(}$$

```
[Out] 10/33*sin(d*x+c)/a^4/d-20/99*sin(d*x+c)^3/a^4/d+2/33*sin(d*x+c)^5/a^4/d+1/1
1*I*cos(d*x+c)^3/d/(a+I*a*tan(d*x+c))^4+7/99*I*cos(d*x+c)^3/a/d/(a+I*a*tan(
d*x+c))^3+4/33*I*cos(d*x+c)^5/d/(a^4+I*a^4*tan(d*x+c))
```

Rubi [A] time = 0.15, antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3502, 3500, 2633}

$$\frac{2\sin^5(c+dx)}{33a^4d}-\frac{20\sin^3(c+dx)}{99a^4d}+\frac{10\sin(c+dx)}{33a^4d}+\frac{4i\cos^5(c+dx)}{33d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{7i\cos^3(c+dx)}{99ad(a+ia\tan(c+dx))^3}+\frac{}{11d(}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (10*Sin[c + d*x])/(33*a^4*d) - (20*Sin[c + d*x]^3)/(99*a^4*d) + (2*Sin[c +
d*x]^5)/(33*a^4*d) + ((I/11)*Cos[c + d*x]^3)/(d*(a + I*a*Tan[c + d*x])^4) +
 (((7*I)/99)*Cos[c + d*x]^3)/(a*d*(a + I*a*Tan[c + d*x])^3) + (((4*I)/33)*C
os[c + d*x]^5)/(d*(a^4 + I*a^4*Tan[c + d*x]))
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3502

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

Rubi steps

$$\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx))^4}\,dx = \frac{i\cos^3(c+dx)}{11d(a+ia\tan(c+dx))^4} + \frac{7\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx))^3}dx}{11a}$$

$$= \frac{i\cos^3(c+dx)}{11d(a+ia\tan(c+dx))^4} + \frac{7i\cos^3(c+dx)}{99ad(a+ia\tan(c+dx))^3} + \frac{14\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx))^2}dx}{33a^2}$$

$$= \frac{i\cos^3(c+dx)}{11d(a+ia\tan(c+dx))^4} + \frac{7i\cos^3(c+dx)}{99ad(a+ia\tan(c+dx))^3} + \frac{4i\cos^5(c+dx)}{33d\left(a^4+ia^4\tan(c+dx)\right)}$$

$$= \frac{i\cos^3(c+dx)}{11d(a+ia\tan(c+dx))^4} + \frac{7i\cos^3(c+dx)}{99ad(a+ia\tan(c+dx))^3} + \frac{4i\cos^5(c+dx)}{33d\left(a^4+ia^4\tan(c+dx)\right)}$$

$$= \frac{10\sin(c+dx)}{33a^4d} - \frac{20\sin^3(c+dx)}{99a^4d} + \frac{2\sin^5(c+dx)}{33a^4d} + \frac{i\cos^3(c+dx)}{11d(a+ia\tan(c+dx))^4} + \frac{}{99a}$$

Mathematica [A] time = 0.51, size = 117, normalized size = 0.75

$$-\frac{i\sec^4(c+dx)(-231i\sin(c+dx)-891i\sin(3(c+dx))+385i\sin(5(c+dx))+21i\sin(7(c+dx))-924\cos(c+d}{6336a^4d(\tan(c+dx)-i)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] ((-1/6336*I)*Sec[c + d*x]^4*(-924*Cos[c + d*x] - 1188*Cos[3*(c + d*x)] + 30
8*Cos[5*(c + d*x)] + 12*Cos[7*(c + d*x)] - (231*I)*Sin[c + d*x] - (891*I)*S
in[3*(c + d*x)] + (385*I)*Sin[5*(c + d*x)] + (21*I)*Sin[7*(c + d*x)]))/(a^4
*d*(-I + Tan[c + d*x])^4)
```

fricas [A] time = 0.45, size = 96, normalized size = 0.62

$$\frac{\left(-33i\,e^{(14i\,dx+14i\,c)} - 693i\,e^{(12i\,dx+12i\,c)} + 2079i\,e^{(10i\,dx+10i\,c)} + 1155i\,e^{(8i\,dx+8i\,c)} + 693i\,e^{(6i\,dx+6i\,c)} + 297i\,e^{(4i\,dx+4i\,c)} + 7}{12672\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/12672*(-33*I*e^(14*I*d*x + 14*I*c) - 693*I*e^(12*I*d*x + 12*I*c) + 2079*I
*e^(10*I*d*x + 10*I*c) + 1155*I*e^(8*I*d*x + 8*I*c) + 693*I*e^(6*I*d*x + 6*
I*c) + 297*I*e^(4*I*d*x + 4*I*c) + 77*I*e^(2*I*d*x + 2*I*c) + 9*I)*e^(-11*I
*d*x - 11*I*c)/(a^4*d)
```

giac [A] time = 2.52, size = 197, normalized size = 1.26

$$\frac{\frac{33\left(12\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2+21i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-11\right)}{a^4\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+i\right)^3} + \frac{5940\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^{10}-39501i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^9-141075\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^8+313236i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/3168*(33*(12*tan(1/2*d*x + 1/2*c)^2 + 21*I*tan(1/2*d*x + 1/2*c) - 11)/(a^
4*(tan(1/2*d*x + 1/2*c) + I)^3) + (5940*tan(1/2*d*x + 1/2*c)^10 - 39501*I*t
an(1/2*d*x + 1/2*c)^9 - 141075*tan(1/2*d*x + 1/2*c)^8 + 313236*I*tan(1/2*d*
x + 1/2*c)^7 + 479556*tan(1/2*d*x + 1/2*c)^6 - 516054*I*tan(1/2*d*x + 1/2*c
```

```
)^5 - 397914*tan(1/2*d*x + 1/2*c)^4 + 214500*I*tan(1/2*d*x + 1/2*c)^3 + 790
24*tan(1/2*d*x + 1/2*c)^2 - 17765*I*tan(1/2*d*x + 1/2*c) - 2155)/(a^4*(tan(
1/2*d*x + 1/2*c) - I)^11))/d
```

maple [A] time = 0.44, size = 240, normalized size = 1.54

$$-\frac{i}{32\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^{2}}-\frac{1}{48\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^{3}}+\frac{2}{16\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+16i}+\frac{8i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{10}}-\frac{67i}{2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{4}}-\frac{44i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{8}}+\frac{3}{6\left(\tan\left(\frac{d}{}\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 2/d/a^4*(-1/64*I/(tan(1/2*d*x+1/2*c)+I)^2-1/96/(tan(1/2*d*x+1/2*c)+I)^3+1/1
6/(tan(1/2*d*x+1/2*c)+I)+4*I/(tan(1/2*d*x+1/2*c)-I)^10-67/4*I/(tan(1/2*d*x+
1/2*c)-I)^4-22*I/(tan(1/2*d*x+1/2*c)-I)^8+385/12*I/(tan(1/2*d*x+1/2*c)-I)^6
+201/64*I/(tan(1/2*d*x+1/2*c)-I)^2-8/11/(tan(1/2*d*x+1/2*c)-I)^11+104/9/(ta
n(1/2*d*x+1/2*c)-I)^9-61/2/(tan(1/2*d*x+1/2*c)-I)^7+105/4/(tan(1/2*d*x+1/2*
c)-I)^5-267/32/(tan(1/2*d*x+1/2*c)-I)^3+15/16/(tan(1/2*d*x+1/2*c)-I))
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 5.61, size = 216, normalized size = 1.38

$$-\frac{\cos\left(\frac{c}{2}+\frac{dx}{2}\right)\left(\frac{269\sin\left(\frac{c}{2}+\frac{dx}{2}\right)}{16}-\frac{1307\sin\left(\frac{3c}{2}+\frac{3dx}{2}\right)}{64}+\frac{1307\sin\left(\frac{5c}{2}+\frac{5dx}{2}\right)}{64}-\frac{1099\sin\left(\frac{7c}{2}+\frac{7dx}{2}\right)}{32}+\frac{203\sin\left(\frac{9c}{2}+\frac{9dx}{2}\right)}{32}-\frac{21\sin\left(\frac{11}{}\right.}{6}\right.}{99\,a^4\,d\left(\cos\left(\frac{c}{2}+\frac{dx}{2}\right)\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3/(a + a*tan(c + d*x)*1i)^4,x)
```

```
[Out] -(cos(c/2 + (d*x)/2)*((cos((3*c)/2 + (3*d*x)/2)*231i)/16 - (cos((5*c)/2 + (
5*d*x)/2)*231i)/16 + cos((7*c)/2 + (7*d*x)/2)*33i - cos((9*c)/2 + (9*d*x)/2
)*5i + (cos((11*c)/2 + (11*d*x)/2)*3i)/16 - (cos((13*c)/2 + (13*d*x)/2)*3i)
/16 + (269*sin(c/2 + (d*x)/2))/16 - (1307*sin((3*c)/2 + (3*d*x)/2))/64 + (1
307*sin((5*c)/2 + (5*d*x)/2))/64 - (1099*sin((7*c)/2 + (7*d*x)/2))/32 + (20
3*sin((9*c)/2 + (9*d*x)/2))/32 - (21*sin((11*c)/2 + (11*d*x)/2))/64 + (21*s
in((13*c)/2 + (13*d*x)/2))/64)*2i)/(99*a^4*d*(cos(c/2 + (d*x)/2) + sin(c/2
+ (d*x)/2)*1i)^11*(cos(c/2 + (d*x)/2)*1i + sin(c/2 + (d*x)/2))^3)
```

sympy [A] time = 0.81, size = 301, normalized size = 1.93

$$\begin{cases}\frac{\left(-167196136166129664ia^{28}d^{7}e^{39ic}e^{3idx}-3511118859488722944ia^{28}d^{7}e^{37ic}e^{idx}+10533356578466168832ia^{28}d^{7}e^{35ic}e^{-idx}+5851864765814538240\right.}{} \\ \frac{x\left(e^{14ic}+7e^{12ic}+21e^{10ic}+35e^{8ic}+35e^{6ic}+21e^{4ic}+7e^{2ic}+1\right)e^{-11ic}}{128a^{4}}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Piecewise(((-167196136166129664*I*a**28*d**7*exp(39*I*c)*exp(3*I*d*x) - 351
1118859488722944*I*a**28*d**7*exp(37*I*c)*exp(I*d*x) + 10533356578466168832
*I*a**28*d**7*exp(35*I*c)*exp(-I*d*x) + 5851864765814538240*I*a**28*d**7*ex
p(33*I*c)*exp(-3*I*d*x) + 3511118859488722944*I*a**28*d**7*exp(31*I*c)*exp(
-5*I*d*x) + 1504765225495166976*I*a**28*d**7*exp(29*I*c)*exp(-7*I*d*x) + 39
0124317720969216*I*a**28*d**7*exp(27*I*c)*exp(-9*I*d*x) + 45598946227126272
*I*a**28*d**7*exp(25*I*c)*exp(-11*I*d*x))*exp(-36*I*c)/(642033162877937909
76*a**32*d**8), Ne(64203316287793790976*a**32*d**8*exp(36*I*c), 0)), (x*(exp
(14*I*c) + 7*exp(12*I*c) + 21*exp(10*I*c) + 35*exp(8*I*c) + 35*exp(6*I*c) +
 21*exp(4*I*c) + 7*exp(2*I*c) + 1)*exp(-11*I*c)/(128*a**4), True))
```

3.165 $\int \frac{\cos^5(c+dx)}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=174

$$-\frac{8\sin^7(c+dx)}{143a^4d}+\frac{168\sin^5(c+dx)}{715a^4d}-\frac{56\sin^3(c+dx)}{143a^4d}+\frac{56\sin(c+dx)}{143a^4d}+\frac{16i\cos^7(c+dx)}{143d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{9i\cos}{143ad(a+i}$$

```
[Out] 56/143*sin(d*x+c)/a^4/d-56/143*sin(d*x+c)^3/a^4/d+168/715*sin(d*x+c)^5/a^4/
d-8/143*sin(d*x+c)^7/a^4/d+1/13*I*cos(d*x+c)^5/d/(a+I*a*tan(d*x+c))^4+9/143
*I*cos(d*x+c)^5/a/d/(a+I*a*tan(d*x+c))^3+16/143*I*cos(d*x+c)^7/d/(a^4+I*a^4
*tan(d*x+c))
```

Rubi [A] time = 0.16, antiderivative size = 174, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3502, 3500, 2633}

$$-\frac{8\sin^7(c+dx)}{143a^4d}+\frac{168\sin^5(c+dx)}{715a^4d}-\frac{56\sin^3(c+dx)}{143a^4d}+\frac{56\sin(c+dx)}{143a^4d}+\frac{16i\cos^7(c+dx)}{143d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{9i\cos}{143ad(a+i}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^5/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (56*Sin[c + d*x])/(143*a^4*d) - (56*Sin[c + d*x]^3)/(143*a^4*d) + (168*Sin[
c + d*x]^5)/(715*a^4*d) - (8*Sin[c + d*x]^7)/(143*a^4*d) + ((I/13)*Cos[c +
d*x]^5)/(d*(a + I*a*Tan[c + d*x])^4) + (((9*I)/143)*Cos[c + d*x]^5)/(a*d*(a
 + I*a*Tan[c + d*x])^3) + (((16*I)/143)*Cos[c + d*x]^7)/(d*(a^4 + I*a^4*Tan
[c + d*x]))
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3502

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

Rubi steps

$$\int \frac{\cos^5(c+dx)}{(a+ia\tan(c+dx))^4}\,dx = \frac{i\cos^5(c+dx)}{13d(a+ia\tan(c+dx))^4} + \frac{9\int \frac{\cos^5(c+dx)}{(a+ia\tan(c+dx))^3}\,dx}{13a}$$

$$= \frac{i\cos^5(c+dx)}{13d(a+ia\tan(c+dx))^4} + \frac{9i\cos^5(c+dx)}{143ad(a+ia\tan(c+dx))^3} + \frac{72\int \frac{\cos^5(c+dx)}{(a+ia\tan(c+dx))^2}\,dx}{143a^2}$$

$$= \frac{i\cos^5(c+dx)}{13d(a+ia\tan(c+dx))^4} + \frac{9i\cos^5(c+dx)}{143ad(a+ia\tan(c+dx))^3} + \frac{16i\cos^7(c+dx)}{143d\left(a^4+ia^4\tan(c+dx)\right.}$$

$$= \frac{i\cos^5(c+dx)}{13d(a+ia\tan(c+dx))^4} + \frac{9i\cos^5(c+dx)}{143ad(a+ia\tan(c+dx))^3} + \frac{16i\cos^7(c+dx)}{143d\left(a^4+ia^4\tan(c+dx)\right.}$$

$$= \frac{56\sin(c+dx)}{143a^4d} - \frac{56\sin^3(c+dx)}{143a^4d} + \frac{168\sin^5(c+dx)}{715a^4d} - \frac{8\sin^7(c+dx)}{143a^4d} + \frac{i\cos^5}{13d(a+ia}$$

Mathematica [A] time = 0.90, size = 139, normalized size = 0.80

$$-\frac{i\sec^4(c+dx)(-6006i\sin(c+dx)-25740i\sin(3(c+dx))+14300i\sin(5(c+dx))+1365i\sin(7(c+dx))+99i\,s}{183040}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^5/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] ((-1/183040*I)*Sec[c + d*x]^4*(-24024*Cos[c + d*x] - 34320*Cos[3*(c + d*x)]
 + 11440*Cos[5*(c + d*x)] + 780*Cos[7*(c + d*x)] + 44*Cos[9*(c + d*x)] - (6
006*I)*Sin[c + d*x] - (25740*I)*Sin[3*(c + d*x)] + (14300*I)*Sin[5*(c + d*x
)] + (1365*I)*Sin[7*(c + d*x)] + (99*I)*Sin[9*(c + d*x)]))/(a^4*d*(-I + Tan
[c + d*x])^4)
```

fricas [A] time = 0.55, size = 118, normalized size = 0.68

$$\frac{\left(-143i\,e^{(18i\,dx+18i\,c)} - 2145i\,e^{(16i\,dx+16i\,c)} - 25740i\,e^{(14i\,dx+14i\,c)} + 60060i\,e^{(12i\,dx+12i\,c)} + 30030i\,e^{(10i\,dx+10i\,c)} + 18018i\right.}{366080\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/366080*(-143*I*e^(18*I*d*x + 18*I*c) - 2145*I*e^(16*I*d*x + 16*I*c) - 257
40*I*e^(14*I*d*x + 14*I*c) + 60060*I*e^(12*I*d*x + 12*I*c) + 30030*I*e^(10*
I*d*x + 10*I*c) + 18018*I*e^(8*I*d*x + 8*I*c) + 8580*I*e^(6*I*d*x + 6*I*c)
+ 2860*I*e^(4*I*d*x + 4*I*c) + 585*I*e^(2*I*d*x + 2*I*c) + 55*I)*e^(-13*I*d
*x - 13*I*c)/(a^4*d)
```

giac [A] time = 2.45, size = 249, normalized size = 1.43

$$\frac{\frac{143\left(115\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^4+405i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-575\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-375i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+98\right)}{a^4\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+i\right)^5} + \frac{166595\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^{12}-1409265i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right.}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] 1/91520*(143*(115*tan(1/2*d*x + 1/2*c)^4 + 405*I*tan(1/2*d*x + 1/2*c)^3 - 5
75*tan(1/2*d*x + 1/2*c)^2 - 375*I*tan(1/2*d*x + 1/2*c) + 98)/(a^4*(tan(1/2*
```

```
d*x + 1/2*c) + I)^5) + (166595*tan(1/2*d*x + 1/2*c)^12 - 1409265*I*tan(1/2*
d*x + 1/2*c)^11 - 6232655*tan(1/2*d*x + 1/2*c)^10 + 17535375*I*tan(1/2*d*x
+ 1/2*c)^9 + 34610004*tan(1/2*d*x + 1/2*c)^8 - 49771722*I*tan(1/2*d*x + 1/2
*c)^7 - 53349582*tan(1/2*d*x + 1/2*c)^6 + 42730974*I*tan(1/2*d*x + 1/2*c)^5
 + 25431835*tan(1/2*d*x + 1/2*c)^4 - 10954229*I*tan(1/2*d*x + 1/2*c)^3 - 32
78067*tan(1/2*d*x + 1/2*c)^2 + 614627*I*tan(1/2*d*x + 1/2*c) + 60094)/(a^4*
(tan(1/2*d*x + 1/2*c) - I)^13))/d
```

maple [A] time = 0.48, size = 306, normalized size = 1.76

$$\frac{i}{32\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^4}-\frac{11i}{128\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^2}+\frac{1}{80\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^5}-\frac{5}{64\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^3}+\frac{23}{128\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)}-\frac{1375i}{32\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^4}-\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^5/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 2/d/a^4*(1/64*I/(tan(1/2*d*x+1/2*c)+I)^4-11/256*I/(tan(1/2*d*x+1/2*c)+I)^2+
1/160/(tan(1/2*d*x+1/2*c)+I)^5-5/128/(tan(1/2*d*x+1/2*c)+I)^3+23/256/(tan(1
/2*d*x+1/2*c)+I)-1375/64*I/(tan(1/2*d*x+1/2*c)-I)^4-135/2*I/(tan(1/2*d*x+1/
2*c)-I)^8+31*I/(tan(1/2*d*x+1/2*c)-I)^10+465/8*I/(tan(1/2*d*x+1/2*c)-I)^6-4
*I/(tan(1/2*d*x+1/2*c)-I)^12+825/256*I/(tan(1/2*d*x+1/2*c)-I)^2+8/13/(tan(1
/2*d*x+1/2*c)-I)^13-150/11/(tan(1/2*d*x+1/2*c)-I)^11+52/(tan(1/2*d*x+1/2*c)
-I)^9-279/4/(tan(1/2*d*x+1/2*c)-I)^7+6291/160/(tan(1/2*d*x+1/2*c)-I)^5-1207
/128/(tan(1/2*d*x+1/2*c)-I)^3+233/256/(tan(1/2*d*x+1/2*c)-I))
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 6.97, size = 262, normalized size = 1.51

$$\cos\left(\frac{c}{2}+\frac{dx}{2}\right)\left(\frac{15049\sin\left(\frac{c}{2}+\frac{dx}{2}\right)}{128}-\frac{4513\sin\left(\frac{3c}{2}+\frac{3dx}{2}\right)}{32}+\frac{4513\sin\left(\frac{5c}{2}+\frac{5dx}{2}\right)}{32}-\frac{15461\sin\left(\frac{7c}{2}+\frac{7dx}{2}\right)}{64}+\frac{3941\sin\left(\frac{9c}{2}+\frac{9dx}{2}\right)}{64}-\frac{183\sin\cdots}{\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^5/(a + a*tan(c + d*x)*1i)^4,x)
```

```
[Out] (cos(c/2 + (d*x)/2)*((cos((3*c)/2 + (3*d*x)/2)*3003i)/32 - (cos((5*c)/2 + (
5*d*x)/2)*3003i)/32 + (cos((7*c)/2 + (7*d*x)/2)*7293i)/32 - (cos((9*c)/2 +
(9*d*x)/2)*1533i)/32 + (cos((11*c)/2 + (11*d*x)/2)*103i)/32 - (cos((13*c)/2
 + (13*d*x)/2)*103i)/32 + (cos((15*c)/2 + (15*d*x)/2)*11i)/64 - (cos((17*c)
/2 + (17*d*x)/2)*11i)/64 + (15049*sin(c/2 + (d*x)/2))/128 - (4513*sin((3*c)
/2 + (3*d*x)/2))/32 + (4513*sin((5*c)/2 + (5*d*x)/2))/32 - (15461*sin((7*c)
/2 + (7*d*x)/2))/64 + (3941*sin((9*c)/2 + (9*d*x)/2))/64 - (183*sin((11*c)/
2 + (11*d*x)/2))/32 + (183*sin((13*c)/2 + (13*d*x)/2))/32 - (99*sin((15*c)/
2 + (15*d*x)/2))/256 + (99*sin((17*c)/2 + (17*d*x)/2))/256)*2i)/(715*a^4*d*
(cos(c/2 + (d*x)/2) + sin(c/2 + (d*x)/2)*1i)^13*(cos(c/2 + (d*x)/2)*1i + si
n(c/2 + (d*x)/2))^5)
```

sympy [A] time = 1.00, size = 369, normalized size = 2.12

$$\begin{cases} \frac{(-1688246017625898163896320ia^{36}d^9e^{54ic}e^{5idx}-2532369026438847245844800ia^{36}d^9e^{52ic}e^{3idx}-3038842831726616695013376000ia^{36}d^9e^{50ic}e^{idx}+70\ldots}{} \\ \frac{x\left(e^{18ic}+9e^{16ic}+36e^{14ic}+84e^{12ic}+126e^{10ic}+126e^{8ic}+84e^{6ic}+36e^{4ic}+9e^{2ic}+1\right)e^{-13ic}}{512a^4} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**5/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Piecewise(((-1688246017625898163896320*I*a**36*d**9*exp(54*I*c)*exp(5*I*d*x
) - 2532369026438847245844800*I*a**36*d**9*exp(52*I*c)*exp(3*I*d*x) - 3038
842831726616695013376000*I*a**36*d**9*exp(50*I*c)*exp(I*d*x) + 7090633274028
77228836454400*I*a**36*d**9*exp(48*I*c)*exp(-I*d*x) + 354531663701438614418
227200*I*a**36*d**9*exp(46*I*c)*exp(-3*I*d*x) + 212718998220863168650936320
*I*a**36*d**9*exp(44*I*c)*exp(-5*I*d*x) + 101294761057553889833779200*I*a**
36*d**9*exp(42*I*c)*exp(-7*I*d*x) + 33764920352517963277926400*I*a**36*d**9
*exp(40*I*c)*exp(-9*I*d*x) + 6906460981196856125030400*I*a**36*d**9*exp(38*
I*c)*exp(-11*I*d*x) + 649325391394576216883200*I*a**36*d**9*exp(36*I*c)*exp
(-13*I*d*x))*exp(-49*I*c)/(4321909805122299299574579200*a**40*d**10), Ne(43
21909805122299299574579200*a**40*d**10*exp(49*I*c), 0)), (x*(exp(18*I*c) +
9*exp(16*I*c) + 36*exp(14*I*c) + 84*exp(12*I*c) + 126*exp(10*I*c) + 126*exp
(8*I*c) + 84*exp(6*I*c) + 36*exp(4*I*c) + 9*exp(2*I*c) + 1)*exp(-13*I*c)/(5
12*a**4), True))
```

3.166 $\int \frac{\sec^{14}(c+dx)}{(a+ia\tan(c+dx))^8}\,dx$

Optimal. Leaf size=134

$$\frac{\tan^5(c+dx)}{5a^8d}+\frac{2i\tan^4(c+dx)}{a^8d}-\frac{10\tan^3(c+dx)}{a^8d}-\frac{36i\tan^2(c+dx)}{a^8d}+\frac{129\tan(c+dx)}{a^8d}+\frac{64i}{d\left(a^8+ia^8\tan(c+dx)\right)}-$$

```
[Out] -192*x/a^8-192*I*ln(cos(d*x+c))/a^8/d+129*tan(d*x+c)/a^8/d-36*I*tan(d*x+c)^
2/a^8/d-10*tan(d*x+c)^3/a^8/d+2*I*tan(d*x+c)^4/a^8/d+1/5*tan(d*x+c)^5/a^8/d
+64*I/d/(a^8+I*a^8*tan(d*x+c))
```

Rubi [A] time = 0.08, antiderivative size = 134, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{\tan^5(c+dx)}{5a^8d}+\frac{2i\tan^4(c+dx)}{a^8d}-\frac{10\tan^3(c+dx)}{a^8d}-\frac{36i\tan^2(c+dx)}{a^8d}+\frac{129\tan(c+dx)}{a^8d}+\frac{64i}{d\left(a^8+ia^8\tan(c+dx)\right)}-$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^14/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (-192*x)/a^8 - ((192*I)*Log[Cos[c + d*x]])/(a^8*d) + (129*Tan[c + d*x])/(a^
8*d) - ((36*I)*Tan[c + d*x]^2)/(a^8*d) - (10*Tan[c + d*x]^3)/(a^8*d) + ((2*
I)*Tan[c + d*x]^4)/(a^8*d) + Tan[c + d*x]^5/(5*a^8*d) + (64*I)/(d*(a^8 + I*
a^8*Tan[c + d*x]))
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^{14}(c+dx)}{(a+ia\tan(c+dx))^8}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{(a-x)^6}{(a+x)^2}\,dx, x, ia\tan(c+dx)\right)}{a^{13}d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(129a^4-72a^3x+30a^2x^2-8ax^3+x^4+\frac{64a^6}{(a+x)^2}-\frac{192a^5}{a+x}\right)dx, x, ia\tan(\right.}{a^{13}d}\\ &= -\frac{192x}{a^8}-\frac{192i\log(\cos(c+dx))}{a^8d}+\frac{129\tan(c+dx)}{a^8d}-\frac{36i\tan^2(c+dx)}{a^8d}-\frac{10\tan^3(}{a^8}\end{aligned}$$

Mathematica [B] time = 2.87, size = 599, normalized size = 4.47

$$\sec(c)\sec^{13}(c+dx)(-\cos(7(c+dx))-i\sin(7(c+dx)))(300idx\sin(c+2dx)-985\sin(c+2dx)+300idx\sin($$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^14/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (Sec[c]*Sec[c + d*x]^13*(-Cos[7*(c + d*x)] - I*Sin[7*(c + d*x)])*((-220*I)*
Cos[3*c + 2*d*x] + 900*d*x*Cos[3*c + 2*d*x] + (238*I)*Cos[3*c + 4*d*x] + 36
0*d*x*Cos[3*c + 4*d*x] - (110*I)*Cos[5*c + 4*d*x] + 360*d*x*Cos[5*c + 4*d*x
] + (77*I)*Cos[5*c + 6*d*x] + 60*d*x*Cos[5*c + 6*d*x] - (10*I)*Cos[7*c + 6*
d*x] + 60*d*x*Cos[7*c + 6*d*x] + 10*Cos[c]*(-7*I + 120*d*x + (120*I)*Log[Co
s[c + d*x]]) + 5*Cos[c + 2*d*x]*(43*I + 180*d*x + (180*I)*Log[Cos[c + d*x]]
) + (900*I)*Cos[3*c + 2*d*x]*Log[Cos[c + d*x]] + (360*I)*Cos[3*c + 4*d*x]*L
og[Cos[c + d*x]] + (360*I)*Cos[5*c + 4*d*x]*Log[Cos[c + d*x]] + (60*I)*Cos[
5*c + 6*d*x]*Log[Cos[c + d*x]] + (60*I)*Cos[7*c + 6*d*x]*Log[Cos[c + d*x]]
+ 870*Sin[c] - 985*Sin[c + 2*d*x] + (300*I)*d*x*Sin[c + 2*d*x] - 300*Log[Co
s[c + d*x]]*Sin[c + 2*d*x] + 320*Sin[3*c + 2*d*x] + (300*I)*d*x*Sin[3*c + 2
*d*x] - 300*Log[Cos[c + d*x]]*Sin[3*c + 2*d*x] - 512*Sin[3*c + 4*d*x] + (24
0*I)*d*x*Sin[3*c + 4*d*x] - 240*Log[Cos[c + d*x]]*Sin[3*c + 4*d*x] + 10*Sin
[5*c + 4*d*x] + (240*I)*d*x*Sin[5*c + 4*d*x] - 240*Log[Cos[c + d*x]]*Sin[5*
c + 4*d*x] - 97*Sin[5*c + 6*d*x] + (60*I)*d*x*Sin[5*c + 6*d*x] - 60*Log[Cos
[c + d*x]]*Sin[5*c + 6*d*x] - 10*Sin[7*c + 6*d*x] + (60*I)*d*x*Sin[7*c + 6*
d*x] - 60*Log[Cos[c + d*x]]*Sin[7*c + 6*d*x]))/(20*a^8*d*(-I + Tan[c + d*x]
)^8)
```

fricas [B] time = 0.64, size = 269, normalized size = 2.01

$$-\frac{1920\,dxe^{(12i\,dx+12i\,c)} + (9600\,dx - 960i)e^{(10i\,dx+10i\,c)} + (19200\,dx - 4320i)e^{(8i\,dx+8i\,c)} + (19200\,dx - 7520i)e^{(6i\,dx+6i\,c}}{5\left(a^8de^{(1}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^14/(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] -1/5*(1920*d*x*e^(12*I*d*x + 12*I*c) + (9600*d*x - 960*I)*e^(10*I*d*x + 10*
I*c) + (19200*d*x - 4320*I)*e^(8*I*d*x + 8*I*c) + (19200*d*x - 7520*I)*e^(6
*I*d*x + 6*I*c) + (9600*d*x - 6160*I)*e^(4*I*d*x + 4*I*c) + (1920*d*x - 219
2*I)*e^(2*I*d*x + 2*I*c) - (-960*I*e^(12*I*d*x + 12*I*c) - 4800*I*e^(10*I*d
*x + 10*I*c) - 9600*I*e^(8*I*d*x + 8*I*c) - 9600*I*e^(6*I*d*x + 6*I*c) - 48
00*I*e^(4*I*d*x + 4*I*c) - 960*I*e^(2*I*d*x + 2*I*c))*log(e^(2*I*d*x + 2*I*
c) + 1) - 160*I)/(a^8*d*e^(12*I*d*x + 12*I*c) + 5*a^8*d*e^(10*I*d*x + 10*I*
c) + 10*a^8*d*e^(8*I*d*x + 8*I*c) + 10*a^8*d*e^(6*I*d*x + 6*I*c) + 5*a^8*d*
e^(4*I*d*x + 4*I*c) + a^8*d*e^(2*I*d*x + 2*I*c))
```

giac [B] time = 7.38, size = 250, normalized size = 1.87

$$-\frac{2\left(\frac{480i\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^8} - \frac{960i\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)}{a^8} + \frac{480i\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)}{a^8} - \frac{5\left(-288i\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2 - 640\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+2\right.}{a^8\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)^2}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^14/(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] -2/5*(480*I*log(tan(1/2*d*x + 1/2*c) + 1)/a^8 - 960*I*log(tan(1/2*d*x + 1/2
*c) - I)/a^8 + 480*I*log(tan(1/2*d*x + 1/2*c) - 1)/a^8 - 5*(-288*I*tan(1/2*
d*x + 1/2*c)^2 - 640*tan(1/2*d*x + 1/2*c) + 288*I)/(a^8*(tan(1/2*d*x + 1/2*
c) - I)^2) + (-1096*I*tan(1/2*d*x + 1/2*c)^10 + 645*tan(1/2*d*x + 1/2*c)^9
+ 5840*I*tan(1/2*d*x + 1/2*c)^8 - 2780*tan(1/2*d*x + 1/2*c)^7 - 12120*I*tan
(1/2*d*x + 1/2*c)^6 + 4286*tan(1/2*d*x + 1/2*c)^5 + 12120*I*tan(1/2*d*x + 1
/2*c)^4 - 2780*tan(1/2*d*x + 1/2*c)^3 - 5840*I*tan(1/2*d*x + 1/2*c)^2 + 645
*tan(1/2*d*x + 1/2*c) + 1096*I)/((tan(1/2*d*x + 1/2*c)^2 - 1)^5*a^8))/d
```

maple [A] time = 0.50, size = 120, normalized size = 0.90

$$\frac{129\tan\left(dx+c\right)}{a^8d}+\frac{\tan^5\left(dx+c\right)}{5a^8d}+\frac{2i\left(\tan^4\left(dx+c\right)\right)}{a^8d}-\frac{10\left(\tan^3\left(dx+c\right)\right)}{a^8d}-\frac{36i\left(\tan^2\left(dx+c\right)\right)}{a^8d}+\frac{64}{a^8d\left(\tan\left(dx+c\right)\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^14/(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 129*tan(d*x+c)/a^8/d+1/5*tan(d*x+c)^5/a^8/d+2*I*tan(d*x+c)^4/a^8/d-10*tan(d
*x+c)^3/a^8/d-36*I*tan(d*x+c)^2/a^8/d+64/a^8/d/(tan(d*x+c)-I)+192*I/a^8/d*l
n(tan(d*x+c)-I)
```

maxima [A] time = 0.44, size = 232, normalized size = 1.73

$$\frac{\frac{5\left(2240\,\tan(dx+c)^6-13440i\,\tan(dx+c)^5-33600\,\tan(dx+c)^4+44800i\,\tan(dx+c)^3+33600\,\tan(dx+c)^2-13440i\,\tan(dx+c)-2240\right)}{35\,a^8\tan(dx+c)^7-245i\,a^8\tan(dx+c)^6-735\,a^8\tan(dx+c)^5+1225i\,a^8\tan(dx+c)^4+1225\,a^8\tan(dx+c)^3-735i\,a^8\tan(dx+c)^2-245\,a^8\tan(dx+c)+35i\,a^8}}{5\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^14/(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] 1/5*(5*(2240*tan(d*x + c)^6 - 13440*I*tan(d*x + c)^5 - 33600*tan(d*x + c)^4
 + 44800*I*tan(d*x + c)^3 + 33600*tan(d*x + c)^2 - 13440*I*tan(d*x + c) - 2
240)/(35*a^8*tan(d*x + c)^7 - 245*I*a^8*tan(d*x + c)^6 - 735*a^8*tan(d*x +
c)^5 + 1225*I*a^8*tan(d*x + c)^4 + 1225*a^8*tan(d*x + c)^3 - 735*I*a^8*tan(
d*x + c)^2 - 245*a^8*tan(d*x + c) + 35*I*a^8) + (tan(d*x + c)^5 + 10*I*tan(
d*x + c)^4 - 50*tan(d*x + c)^3 - 180*I*tan(d*x + c)^2 + 645*tan(d*x + c))/a
^8 + 960*I*log(I*tan(d*x + c) + 1)/a^8)/d
```

mupad [B] time = 3.45, size = 105, normalized size = 0.78

$$\frac{\frac{129\tan(c+d\,x)}{a^8}-\frac{10\tan(c+d\,x)^3}{a^8}+\frac{\tan(c+d\,x)^5}{5\,a^8}+\frac{\ln(\tan(c+d\,x)-\mathrm{i})\,192\mathrm{i}}{a^8}+\frac{64\mathrm{i}}{a^8\,(1+\tan(c+d\,x)\,1\mathrm{i})}-\frac{\tan(c+d\,x)^2\,36\mathrm{i}}{a^8}+\frac{\tan(c+d\,x)^4\,2\mathrm{i}}{a^8}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^14*(a + a*tan(c + d*x)*1i)^8),x)
```

```
[Out] ((log(tan(c + d*x) - 1i)*192i)/a^8 + (129*tan(c + d*x))/a^8 + 64i/(a^8*(tan
(c + d*x)*1i + 1)) - (tan(c + d*x)^2*36i)/a^8 - (10*tan(c + d*x)^3)/a^8 + (
tan(c + d*x)^4*2i)/a^8 + tan(c + d*x)^5/(5*a^8))/d
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**14/(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Timed out
```

3.167 $\int \frac{\sec^{12}(c+dx)}{(a+ia\tan(c+dx))^8}\,dx$

Optimal. Leaf size=126

$$\frac{\tan^3(c+dx)}{3a^8d}+\frac{4i\tan^2(c+dx)}{a^8d}-\frac{31\tan(c+dx)}{a^8d}-\frac{80i}{d\left(a^8+ia^8\tan(c+dx)\right)}+\frac{80i\log(\cos(c+dx))}{a^8d}+\frac{80x}{a^8}+\frac{1}{d\left(a^4+ia^4\right.}$$

```
[Out] 80*x/a^8+80*I*ln(cos(d*x+c))/a^8/d-31*tan(d*x+c)/a^8/d+4*I*tan(d*x+c)^2/a^8
/d+1/3*tan(d*x+c)^3/a^8/d+16*I/d/(a^4+I*a^4*tan(d*x+c))^2-80*I/d/(a^8+I*a^8
*tan(d*x+c))
```

Rubi [A] time = 0.08, antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{\tan^3(c+dx)}{3a^8d}+\frac{4i\tan^2(c+dx)}{a^8d}-\frac{31\tan(c+dx)}{a^8d}-\frac{80i}{d\left(a^8+ia^8\tan(c+dx)\right)}+\frac{16i}{d\left(a^4+ia^4\tan(c+dx)\right)^2}+\frac{80i\log(\cos(}{a^8d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^12/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (80*x)/a^8 + ((80*I)*Log[Cos[c + d*x]])/(a^8*d) - (31*Tan[c + d*x])/(a^8*d)
 + ((4*I)*Tan[c + d*x]^2)/(a^8*d) + Tan[c + d*x]^3/(3*a^8*d) + (16*I)/(d*(a
^4 + I*a^4*Tan[c + d*x])^2) - (80*I)/(d*(a^8 + I*a^8*Tan[c + d*x]))
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^{12}(c+dx)}{(a+ia\tan(c+dx))^8}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{(a-x)^5}{(a+x)^3}\,dx,x,ia\tan(c+dx)\right)}{a^{11}d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(-31a^2+8ax-x^2+\frac{32a^5}{(a+x)^3}-\frac{80a^4}{(a+x)^2}+\frac{80a^3}{a+x}\right)dx,x,ia\tan(c+dx)\right)}{a^{11}d}\\ &= \frac{80x}{a^8}+\frac{80i\log(\cos(c+dx))}{a^8d}-\frac{31\tan(c+dx)}{a^8d}+\frac{4i\tan^2(c+dx)}{a^8d}+\frac{\tan^3(c+dx)}{3a^8d}+\frac{}{d}\end{aligned}$$

Mathematica [B] time = 1.55, size = 537, normalized size = 4.26

$$\frac{\sec(c)\sec^{11}(c+dx)(\cos(6(c+dx))+i\sin(6(c+dx)))(120idx\sin(2c+dx)+87\sin(2c+dx)+180idx\sin(2c+3}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^12/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (Sec[c]*Sec[c + d*x]^11*(Cos[6*(c + d*x)] + I*Sin[6*(c + d*x)])*((66*I)*Cos
[2*c + 3*d*x] + 180*d*x*Cos[2*c + 3*d*x] - (75*I)*Cos[4*c + 3*d*x] + 180*d*
x*Cos[4*c + 3*d*x] + (50*I)*Cos[4*c + 5*d*x] + 60*d*x*Cos[4*c + 5*d*x] + (3
*I)*Cos[6*c + 5*d*x] + 60*d*x*Cos[6*c + 5*d*x] + 3*Cos[2*c + d*x]*(-71*I +
80*d*x + (80*I)*Log[Cos[c + d*x]]) + Cos[d*x]*(-119*I + 240*d*x + (240*I)*L
og[Cos[c + d*x]]) + (180*I)*Cos[2*c + 3*d*x]*Log[Cos[c + d*x]] + (180*I)*Co
s[4*c + 3*d*x]*Log[Cos[c + d*x]] + (60*I)*Cos[4*c + 5*d*x]*Log[Cos[c + d*x]
] + (60*I)*Cos[6*c + 5*d*x]*Log[Cos[c + d*x]] - 101*Sin[d*x] + (120*I)*d*x*
Sin[d*x] - 120*Log[Cos[c + d*x]]*Sin[d*x] + 87*Sin[2*c + d*x] + (120*I)*d*x
*Sin[2*c + d*x] - 120*Log[Cos[c + d*x]]*Sin[2*c + d*x] - 96*Sin[2*c + 3*d*x
] + (180*I)*d*x*Sin[2*c + 3*d*x] - 180*Log[Cos[c + d*x]]*Sin[2*c + 3*d*x] +
 45*Sin[4*c + 3*d*x] + (180*I)*d*x*Sin[4*c + 3*d*x] - 180*Log[Cos[c + d*x]]
*Sin[4*c + 3*d*x] - 44*Sin[4*c + 5*d*x] + (60*I)*d*x*Sin[4*c + 5*d*x] - 60*
Log[Cos[c + d*x]]*Sin[4*c + 5*d*x] + 3*Sin[6*c + 5*d*x] + (60*I)*d*x*Sin[6*
c + 5*d*x] - 60*Log[Cos[c + d*x]]*Sin[6*c + 5*d*x]))/(12*a^8*d*(-I + Tan[c
+ d*x])^8)
```

fricas [A] time = 0.66, size = 195, normalized size = 1.55

$$\frac{480\,dxe^{(10i\,dx+10i\,c)}+(1440\,dx-240i)e^{(8i\,dx+8i\,c)}+(1440\,dx-600i)e^{(6i\,dx+6i\,c)}+(480\,dx-440i)e^{(4i\,dx+4i\,c)}+\left(24\right.}{3\left(a^8de^{(10i\,dx+10i\,c)}+3\,a^8de^{(8i\,dx+8i\,c)}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^12/(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/3*(480*d*x*e^(10*I*d*x + 10*I*c) + (1440*d*x - 240*I)*e^(8*I*d*x + 8*I*c)
 + (1440*d*x - 600*I)*e^(6*I*d*x + 6*I*c) + (480*d*x - 440*I)*e^(4*I*d*x +
4*I*c) + (240*I*e^(10*I*d*x + 10*I*c) + 720*I*e^(8*I*d*x + 8*I*c) + 720*I*e
^(6*I*d*x + 6*I*c) + 240*I*e^(4*I*d*x + 4*I*c))*log(e^(2*I*d*x + 2*I*c) + 1
) - 60*I*e^(2*I*d*x + 2*I*c) + 12*I)/(a^8*d*e^(10*I*d*x + 10*I*c) + 3*a^8*d
*e^(8*I*d*x + 8*I*c) + 3*a^8*d*e^(6*I*d*x + 6*I*c) + a^8*d*e^(4*I*d*x + 4*I
*c))
```

giac [A] time = 4.97, size = 223, normalized size = 1.77

$$-\frac{2\left(-\frac{120i\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^8}+\frac{240i\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)}{a^8}-\frac{120i\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)}{a^8}+\frac{220i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^6-93\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^12/(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] -2/3*(-120*I*log(tan(1/2*d*x + 1/2*c) + 1)/a^8 + 240*I*log(tan(1/2*d*x + 1/
2*c) - I)/a^8 - 120*I*log(tan(1/2*d*x + 1/2*c) - 1)/a^8 + (220*I*tan(1/2*d*
x + 1/2*c)^6 - 93*tan(1/2*d*x + 1/2*c)^5 - 684*I*tan(1/2*d*x + 1/2*c)^4 + 1
90*tan(1/2*d*x + 1/2*c)^3 + 684*I*tan(1/2*d*x + 1/2*c)^2 - 93*tan(1/2*d*x +
 1/2*c) - 220*I)/((tan(1/2*d*x + 1/2*c)^2 - 1)^3*a^8) + (-500*I*tan(1/2*d*x
 + 1/2*c)^4 - 2144*tan(1/2*d*x + 1/2*c)^3 + 3384*I*tan(1/2*d*x + 1/2*c)^2 +
 2144*tan(1/2*d*x + 1/2*c) - 500*I)/(a^8*(tan(1/2*d*x + 1/2*c) - I)^4))/d
```

maple [A] time = 0.45, size = 107, normalized size = 0.85

$$-\frac{31\tan(dx+c)}{a^8d}+\frac{\tan^3(dx+c)}{3a^8d}+\frac{4i\left(\tan^2(dx+c)\right)}{a^8d}-\frac{16i}{a^8d\left(\tan(dx+c)-i\right)^2}-\frac{80}{a^8d\left(\tan(dx+c)-i\right)}-\frac{80i\ln\left(\tan\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^12/(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] -31*tan(d*x+c)/a^8/d+1/3*tan(d*x+c)^3/a^8/d+4*I*tan(d*x+c)^2/a^8/d-16*I/a^8
/d/(tan(d*x+c)-I)^2-80/a^8/d/(tan(d*x+c)-I)-80*I/a^8/d*ln(tan(d*x+c)-I)
```

maxima [A] time = 0.36, size = 213, normalized size = 1.69

$$-\frac{\frac{3\left(1680\tan(dx+c)^6-9744i\tan(dx+c)^5-23520\tan(dx+c)^4+30240i\tan(dx+c)^3+21840\tan(dx+c)^2-8400i\tan(dx+c)-1344\right)}{21a^8\tan(dx+c)^7-147ia^8\tan(dx+c)^6-441a^8\tan(dx+c)^5+735ia^8\tan(dx+c)^4+735a^8\tan(dx+c)^3-441ia^8\tan(dx+c)^2-147a^8\tan(dx+c)+21ia^8}-\text{ta}}{3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^12/(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] -1/3*(3*(1680*tan(d*x + c)^6 - 9744*I*tan(d*x + c)^5 - 23520*tan(d*x + c)^4
 + 30240*I*tan(d*x + c)^3 + 21840*tan(d*x + c)^2 - 8400*I*tan(d*x + c) - 13
44)/(21*a^8*tan(d*x + c)^7 - 147*I*a^8*tan(d*x + c)^6 - 441*a^8*tan(d*x + c
)^5 + 735*I*a^8*tan(d*x + c)^4 + 735*a^8*tan(d*x + c)^3 - 441*I*a^8*tan(d*x
 + c)^2 - 147*a^8*tan(d*x + c) + 21*I*a^8) - (tan(d*x + c)^3 + 12*I*tan(d*x
 + c)^2 - 93*tan(d*x + c))/a^8 + 240*I*log(I*tan(d*x + c) + 1)/a^8)/d
```

mupad [B] time = 3.44, size = 114, normalized size = 0.90

$$\frac{\tan(c+d\,x)^3}{3\,a^8\,d}-\frac{31\tan(c+d\,x)}{a^8\,d}+\frac{\tan(c+d\,x)^2\,4\mathrm{i}}{a^8\,d}-\frac{\ln(\tan(c+d\,x)-\mathrm{i})\,80\mathrm{i}}{a^8\,d}-\frac{\frac{64}{a^8}+\frac{\tan(c+d\,x)\,80\mathrm{i}}{a^8}}{d\left(\tan(c+d\,x)^2\,1\mathrm{i}+2\tan(c+d\,x)\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^12*(a + a*tan(c + d*x)*1i)^8),x)
```

```
[Out] (tan(c + d*x)^2*4i)/(a^8*d) - (31*tan(c + d*x))/(a^8*d) - (log(tan(c + d*x)
 - 1i)*80i)/(a^8*d) + tan(c + d*x)^3/(3*a^8*d) - ((tan(c + d*x)*80i)/a^8 +
64/a^8)/(d*(2*tan(c + d*x) + tan(c + d*x)^2*1i - 1i))
```

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

$$\frac{\int \frac{\sec^{12}(c+dx)}{\tan^8(c+dx)-8i\tan^7(c+dx)-28\tan^6(c+dx)+56i\tan^5(c+dx)+70\tan^4(c+dx)-56i\tan^3(c+dx)-28\tan^2(c+dx)+8i\tan(c+dx)+1}\,dx}{a^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**12/(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Integral(sec(c + d*x)**12/(tan(c + d*x)**8 - 8*I*tan(c + d*x)**7 - 28*tan(c
 + d*x)**6 + 56*I*tan(c + d*x)**5 + 70*tan(c + d*x)**4 - 56*I*tan(c + d*x)*
*3 - 28*tan(c + d*x)**2 + 8*I*tan(c + d*x) + 1), x)/a**8
```

3.168 $\int \frac{\sec^{10}(c+dx)}{(a+ia\tan(c+dx))^8}\,dx$

Optimal. Leaf size=116

$$\frac{\tan(c+dx)}{a^8d}+\frac{24i}{d\left(a^8+ia^8\tan(c+dx)\right)}-\frac{8i\log(\cos(c+dx))}{a^8d}-\frac{8x}{a^8}+\frac{16i}{3a^5d(a+ia\tan(c+dx))^3}-\frac{16i}{d\left(a^4+ia^4\tan(c+\right.}$$

```
[Out] -8*x/a^8-8*I*ln(cos(d*x+c))/a^8/d+tan(d*x+c)/a^8/d+16/3*I/a^5/d/(a+I*a*tan(
d*x+c))^3-16*I/d/(a^4+I*a^4*tan(d*x+c))^2+24*I/d/(a^8+I*a^8*tan(d*x+c))
```

Rubi [A] time = 0.07, antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {3487, 43}

$$\frac{\tan(c+dx)}{a^8d}+\frac{24i}{d\left(a^8+ia^8\tan(c+dx)\right)}-\frac{16i}{d\left(a^4+ia^4\tan(c+dx)\right)^2}+\frac{16i}{3a^5d(a+ia\tan(c+dx))^3}-\frac{8i\log(\cos(c+dx}{a^8d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^10/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (-8*x)/a^8 - ((8*I)*Log[Cos[c + d*x]])/(a^8*d) + Tan[c + d*x]/(a^8*d) + ((1
6*I)/3)/(a^5*d*(a + I*a*Tan[c + d*x])^3) - (16*I)/(d*(a^4 + I*a^4*Tan[c + d
*x])^2) + (24*I)/(d*(a^8 + I*a^8*Tan[c + d*x]))
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^{10}(c+dx)}{(a+ia\tan(c+dx))^8}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{(a-x)^4}{(a+x)^4}\,dx, x, ia\tan(c+dx)\right)}{a^9d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(1+\frac{16a^4}{(a+x)^4}-\frac{32a^3}{(a+x)^3}+\frac{24a^2}{(a+x)^2}-\frac{8a}{a+x}\right)dx, x, ia\tan(c+dx)\right)}{a^9d}\\ &= -\frac{8x}{a^8}-\frac{8i\log(\cos(c+dx))}{a^8d}+\frac{\tan(c+dx)}{a^8d}+\frac{16i}{3a^5d(a+ia\tan(c+dx))^3}-\frac{}{d\left(a^4+\right.}\end{aligned}$$

Mathematica [B] time = 1.06, size = 397, normalized size = 3.42

$$\frac{\sec(c)\sec^9(c+dx)(-\cos(5(c+dx))-i\sin(5(c+dx)))(12idx\sin(c+2dx)+11\sin(c+2dx)+12idx\sin(3c+}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^10/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (Sec[c]*Sec[c + d*x]^9*(-Cos[5*(c + d*x)] - I*Sin[5*(c + d*x)])*((-12*I)*Co
s[c] - (10*I)*Cos[3*c + 2*d*x] + 12*d*x*Cos[3*c + 2*d*x] + (2*I)*Cos[3*c +
4*d*x] + 12*d*x*Cos[3*c + 4*d*x] - I*Cos[5*c + 4*d*x] + 12*d*x*Cos[5*c + 4*
d*x] + Cos[c + 2*d*x]*(-7*I + 12*d*x + (12*I)*Log[Cos[c + d*x]]) + (12*I)*C
os[3*c + 2*d*x]*Log[Cos[c + d*x]] + (12*I)*Cos[3*c + 4*d*x]*Log[Cos[c + d*x
]] + (12*I)*Cos[5*c + 4*d*x]*Log[Cos[c + d*x]] + 11*Sin[c + 2*d*x] + (12*I)
*d*x*Sin[c + 2*d*x] - 12*Log[Cos[c + d*x]]*Sin[c + 2*d*x] + 14*Sin[3*c + 2*
d*x] + (12*I)*d*x*Sin[3*c + 2*d*x] - 12*Log[Cos[c + d*x]]*Sin[3*c + 2*d*x]
- 4*Sin[3*c + 4*d*x] + (12*I)*d*x*Sin[3*c + 4*d*x] - 12*Log[Cos[c + d*x]]*S
in[3*c + 4*d*x] - Sin[5*c + 4*d*x] + (12*I)*d*x*Sin[5*c + 4*d*x] - 12*Log[C
os[c + d*x]]*Sin[5*c + 4*d*x]))/(6*a^8*d*(-I + Tan[c + d*x])^8)
```

fricas [A] time = 0.61, size = 123, normalized size = 1.06

$$-\frac{48\,dxe^{(8i\,dx+8i\,c)} + (48\,dx - 24i)e^{(6i\,dx+6i\,c)} - \left(-24i\,e^{(8i\,dx+8i\,c)} - 24i\,e^{(6i\,dx+6i\,c)}\right)\log\left(e^{(2i\,dx+2i\,c)} + 1\right) - 12i\,e^{(4i\,dx+4i\,c)}}{3\left(a^8de^{(8i\,dx+8i\,c)} + a^8de^{(6i\,dx+6i\,c)}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] -1/3*(48*d*x*e^(8*I*d*x + 8*I*c) + (48*d*x - 24*I)*e^(6*I*d*x + 6*I*c) - (-
24*I*e^(8*I*d*x + 8*I*c) - 24*I*e^(6*I*d*x + 6*I*c))*log(e^(2*I*d*x + 2*I*c
) + 1) - 12*I*e^(4*I*d*x + 4*I*c) + 4*I*e^(2*I*d*x + 2*I*c) - 2*I)/(a^8*d*e
^(8*I*d*x + 8*I*c) + a^8*d*e^(6*I*d*x + 6*I*c))
```

giac [A] time = 3.98, size = 198, normalized size = 1.71

$$-\frac{2\left(\frac{60i\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^8} - \frac{120i\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)}{a^8} + \frac{60i\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)}{a^8} - \frac{15\left(4i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-4i\right)}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)a^8} + \frac{294}{}\right.}{15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] -2/15*(60*I*log(tan(1/2*d*x + 1/2*c) + 1)/a^8 - 120*I*log(tan(1/2*d*x + 1/2
*c) - I)/a^8 + 60*I*log(tan(1/2*d*x + 1/2*c) - 1)/a^8 - 15*(4*I*tan(1/2*d*x
 + 1/2*c)^2 - tan(1/2*d*x + 1/2*c) - 4*I)/((tan(1/2*d*x + 1/2*c)^2 - 1)*a^8
) + (294*I*tan(1/2*d*x + 1/2*c)^6 + 1884*tan(1/2*d*x + 1/2*c)^5 - 4890*I*ta
n(1/2*d*x + 1/2*c)^4 - 6920*tan(1/2*d*x + 1/2*c)^3 + 4890*I*tan(1/2*d*x + 1
/2*c)^2 + 1884*tan(1/2*d*x + 1/2*c) - 294*I)/(a^8*(tan(1/2*d*x + 1/2*c) - I
)^6))/d
```

maple [A] time = 0.44, size = 92, normalized size = 0.79

$$\frac{\tan\left(dx+c\right)}{a^8d}+\frac{16i}{a^8d\left(\tan\left(dx+c\right)-i\right)^2}+\frac{24}{a^8d\left(\tan\left(dx+c\right)-i\right)}-\frac{16}{3a^8d\left(\tan\left(dx+c\right)-i\right)^3}+\frac{8i\ln\left(\tan\left(dx+c\right)-i\right)}{a^8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] tan(d*x+c)/a^8/d+16*I/a^8/d/(tan(d*x+c)-I)^2+24/a^8/d/(tan(d*x+c)-I)-16/3/a
^8/d/(tan(d*x+c)-I)^3+8*I/a^8/d*ln(tan(d*x+c)-I)
```

maxima [A] time = 0.67, size = 189, normalized size = 1.63

$$\frac{\frac{2520\,\tan\left(dx+c\right)^6-13440i\,\tan\left(dx+c\right)^5-29960\,\tan\left(dx+c\right)^4+35840i\,\tan\left(dx+c\right)^3+24360\,\tan\left(dx+c\right)^2-8960i\,\tan\left(dx+c\right)-1400}{105\,a^8\tan\left(dx+c\right)^7-735i\,a^8\tan\left(dx+c\right)^6-2205\,a^8\tan\left(dx+c\right)^5+3675i\,a^8\tan\left(dx+c\right)^4+3675\,a^8\tan\left(dx+c\right)^3-2205i\,a^8\tan\left(dx+c\right)^2-735\,a^8\tan\left(dx+c\right)+105i\,a^8}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] ((2520*tan(d*x + c)^6 - 13440*I*tan(d*x + c)^5 - 29960*tan(d*x + c)^4 + 358
40*I*tan(d*x + c)^3 + 24360*tan(d*x + c)^2 - 8960*I*tan(d*x + c) - 1400)/(1
05*a^8*tan(d*x + c)^7 - 735*I*a^8*tan(d*x + c)^6 - 2205*a^8*tan(d*x + c)^5
+ 3675*I*a^8*tan(d*x + c)^4 + 3675*a^8*tan(d*x + c)^3 - 2205*I*a^8*tan(d*x
+ c)^2 - 735*a^8*tan(d*x + c) + 105*I*a^8) + 8*I*log(I*tan(d*x + c) + 1)/a^
8 + tan(d*x + c)/a^8)/d
```

mupad [B] time = 3.50, size = 104, normalized size = 0.90

$$\frac{\tan(c+d\,x)}{a^8\,d}-\frac{\frac{32\tan(c+d\,x)}{a^8}-\frac{40\mathrm{i}}{3\,a^8}+\frac{\tan(c+d\,x)^2\,24\mathrm{i}}{a^8}}{d\,\left(-\tan(c+d\,x)^3\,1\mathrm{i}-3\tan(c+d\,x)^2+\tan(c+d\,x)\,3\mathrm{i}+1\right)}+\frac{\ln(\tan(c+d\,x)-\mathrm{i})\,8\mathrm{i}}{a^8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^10*(a + a*tan(c + d*x)*1i)^8),x)
```

```
[Out] (log(tan(c + d*x) - 1i)*8i)/(a^8*d) - ((32*tan(c + d*x))/a^8 - 40i/(3*a^8)
+ (tan(c + d*x)^2*24i)/a^8)/(d*(tan(c + d*x)*3i - 3*tan(c + d*x)^2 - tan(c
+ d*x)^3*1i + 1)) + tan(c + d*x)/(a^8*d)
```

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

$$\frac{\int\frac{\sec^{10}(c+dx)}{\tan^8(c+dx)-8i\tan^7(c+dx)-28\tan^6(c+dx)+56i\tan^5(c+dx)+70\tan^4(c+dx)-56i\tan^3(c+dx)-28\tan^2(c+dx)+8i\tan(c+dx)+1}\,dx}{a^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**10/(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Integral(sec(c + d*x)**10/(tan(c + d*x)**8 - 8*I*tan(c + d*x)**7 - 28*tan(c
 + d*x)**6 + 56*I*tan(c + d*x)**5 + 70*tan(c + d*x)**4 - 56*I*tan(c + d*x)*
*3 - 28*tan(c + d*x)**2 + 8*I*tan(c + d*x) + 1), x)/a**8
```

3.169 $\int \frac{\sec^8(c+dx)}{(a+ia\tan(c+dx))^8}\,dx$

Optimal. Leaf size=43

$$\frac{i(a-ia\tan(c+dx))^4}{8d\left(a^3+ia^3\tan(c+dx)\right)^4}$$

```
[Out] 1/8*I*(a-I*a*tan(d*x+c))^4/d/(a^3+I*a^3*tan(d*x+c))^4
```

Rubi [A] time = 0.04, antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = $\{3487, 37\}$

$$\frac{i(a-ia\tan(c+dx))^4}{8d\left(a^3+ia^3\tan(c+dx)\right)^4}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^8/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((I/8)*(a - I*a*Tan[c + d*x])^4)/(d*(a^3 + I*a^3*Tan[c + d*x])^4)
```

Rule 37

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^8(c+dx)}{(a+ia\tan(c+dx))^8}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{(a-x)^3}{(a+x)^5}\,dx, x, ia\tan(c+dx)\right)}{a^7d}\\ &= \frac{i(a-ia\tan(c+dx))^4}{8d\left(a^3+ia^3\tan(c+dx)\right)^4}\end{aligned}$$

Mathematica [A] time = 0.07, size = 32, normalized size = 0.74

$$\frac{i\sec^8(c+dx)}{8d(a+ia\tan(c+dx))^8}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^8/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((I/8)*Sec[c + d*x]^8)/(d*(a + I*a*Tan[c + d*x])^8)
```

fricas [A] time = 0.56, size = 17, normalized size = 0.40

$$\frac{i\,e^{(-8i\,dx-8i\,c)}}{8\,a^8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/8*I*e^(-8*I*d*x - 8*I*c)/(a^8*d)
```

giac [A] time = 4.80, size = 70, normalized size = 1.63

$$-\frac{2\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{7}-7\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{5}+7\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{3}-\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}{a^{8}d\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] -2*(tan(1/2*d*x + 1/2*c)^7 - 7*tan(1/2*d*x + 1/2*c)^5 + 7*tan(1/2*d*x + 1/2
*c)^3 - tan(1/2*d*x + 1/2*c))/(a^8*d*(tan(1/2*d*x + 1/2*c) - I)^8)
```

maple [A] time = 0.53, size = 63, normalized size = 1.47

$$\frac{-\frac{1}{\tan(dx+c)-i}+\frac{4}{(\tan(dx+c)-i)^{3}}-\frac{3i}{(\tan(dx+c)-i)^{2}}+\frac{2i}{(\tan(dx+c)-i)^{4}}}{d\,a^{8}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/d/a^8*(-1/(tan(d*x+c)-I)+4/(tan(d*x+c)-I)^3-3*I/(tan(d*x+c)-I)^2+2*I/(tan
(d*x+c)-I)^4)
```

maxima [B] time = 0.37, size = 161, normalized size = 3.74

$$-\frac{35\,\tan\left(dx+c\right)^{6}-105i\,\tan\left(dx+c\right)^{5}-140\,\tan\left(dx+c\right)^{4}+140i\,\tan\left(dx+c\right)^{3}+10}{\left(35\,a^{8}\tan\left(dx+c\right)^{7}-245i\,a^{8}\tan\left(dx+c\right)^{6}-735\,a^{8}\tan\left(dx+c\right)^{5}+1225i\,a^{8}\tan\left(dx+c\right)^{4}+1225\,a^{8}\tan\left(dx\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] -(35*tan(d*x + c)^6 - 105*I*tan(d*x + c)^5 - 140*tan(d*x + c)^4 + 140*I*tan
(d*x + c)^3 + 105*tan(d*x + c)^2 - 35*I*tan(d*x + c))/((35*a^8*tan(d*x + c)
^7 - 245*I*a^8*tan(d*x + c)^6 - 735*a^8*tan(d*x + c)^5 + 1225*I*a^8*tan(d*x
 + c)^4 + 1225*a^8*tan(d*x + c)^3 - 735*I*a^8*tan(d*x + c)^2 - 245*a^8*tan(
d*x + c) + 35*I*a^8)*d)
```

mupad [B] time = 3.51, size = 73, normalized size = 1.70

$$-\frac{\tan\left(c+d\,x\right)\,\left({\tan\left(c+d\,x\right)}^2\,1{}\mathrm{i}-\mathrm{i}\right)}{a^8\,d\,\left({\tan\left(c+d\,x\right)}^4\,1{}\mathrm{i}+4\,{\tan\left(c+d\,x\right)}^3-{\tan\left(c+d\,x\right)}^2\,6{}\mathrm{i}-4\,\tan\left(c+d\,x\right)+1{}\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^8*(a + a*tan(c + d*x)*1i)^8),x)
```

```
[Out] -(tan(c + d*x)*(tan(c + d*x)^2*1i - 1i))/(a^8*d*(4*tan(c + d*x)^3 - tan(c +
 d*x)^2*6i - 4*tan(c + d*x) + tan(c + d*x)^4*1i + 1i))
```

sympy [A] time = 35.85, size = 160, normalized size = 3.72

$$\begin{cases} \frac{i\sec^8(c+dx)}{8a^8d\tan^8(c+dx)-64ia^8d\tan^7(c+dx)-224a^8d\tan^6(c+dx)+448ia^8d\tan^5(c+dx)+560a^8d\tan^4(c+dx)-448ia^8d\tan^3(c+dx)-224a^8d\tan^2(c+dx)+64ia^8 \\ \frac{x\sec^8(c)}{(ia\tan(c)+a)^8} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8/(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Piecewise((I*sec(c + d*x)**8/(8*a**8*d*tan(c + d*x)**8 - 64*I*a**8*d*tan(c
+ d*x)**7 - 224*a**8*d*tan(c + d*x)**6 + 448*I*a**8*d*tan(c + d*x)**5 + 560
*a**8*d*tan(c + d*x)**4 - 448*I*a**8*d*tan(c + d*x)**3 - 224*a**8*d*tan(c +
 d*x)**2 + 64*I*a**8*d*tan(c + d*x) + 8*a**8*d), Ne(d, 0)), (x*sec(c)**8/(I
*a*tan(c) + a)**8, True))
```

3.170 $\int \frac{\sec^6(c+dx)}{(a+ia\tan(c+dx))^8}\,dx$

Optimal. Leaf size=81

$$\frac{i}{3a^5d(a+ia\tan(c+dx))^3}+\frac{4i}{5a^3d(a+ia\tan(c+dx))^5}-\frac{i}{d\left(a^2+ia^2\tan(c+dx)\right)^4}$$

```
[Out] 4/5*I/a^3/d/(a+I*a*tan(d*x+c))^5+1/3*I/a^5/d/(a+I*a*tan(d*x+c))^3-I/d/(a^2+
I*a^2*tan(d*x+c))^4
```

Rubi [A] time = 0.06, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{i}{3a^5d(a+ia\tan(c+dx))^3}-\frac{i}{d\left(a^2+ia^2\tan(c+dx)\right)^4}+\frac{4i}{5a^3d(a+ia\tan(c+dx))^5}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((4*I)/5)/(a^3*d*(a + I*a*Tan[c + d*x])^5) + (I/3)/(a^5*d*(a + I*a*Tan[c +
d*x])^3) - I/(d*(a^2 + I*a^2*Tan[c + d*x])^4)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^6(c+dx)}{(a+ia\tan(c+dx))^8}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{(a-x)^2}{(a+x)^6}\,dx,x,ia\tan(c+dx)\right)}{a^5d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(\frac{4a^2}{(a+x)^6}-\frac{4a}{(a+x)^5}+\frac{1}{(a+x)^4}\right)dx,x,ia\tan(c+dx)\right)}{a^5d}\\ &= \frac{4i}{5a^3d(a+ia\tan(c+dx))^5}+\frac{i}{3a^5d(a+ia\tan(c+dx))^3}-\frac{i}{d\left(a^2+ia^2\tan(c+dx)\right)}\end{aligned}$$

Mathematica [A] time = 0.28, size = 56, normalized size = 0.69

$$\frac{i\sec^8(c+dx)(4i\sin(2(c+dx))+16\cos(2(c+dx))+15)}{240a^8d(\tan(c+dx)-i)^8}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((I/240)*Sec[c + d*x]^8*(15 + 16*Cos[2*(c + d*x)] + (4*I)*Sin[2*(c + d*x)])
)/(a^8*d*(-I + Tan[c + d*x])^8)
```

fricas [A] time = 0.66, size = 41, normalized size = 0.51

$$\frac{\left(10i\,e^{(4i\,dx+4i\,c)}+15i\,e^{(2i\,dx+2i\,c)}+6i\right)e^{(-10i\,dx-10i\,c)}}{240\,a^8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/240*(10*I*e^(4*I*d*x + 4*I*c) + 15*I*e^(2*I*d*x + 2*I*c) + 6*I)*e^(-10*I*
d*x - 10*I*c)/(a^8*d)
```

giac [B] time = 5.21, size = 137, normalized size = 1.69

$$-\frac{2\left(15\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^9-30i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^8-140\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7+170i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^6+282\,\tan\left(\frac{1}{2}\,d\right.\right.}{15\,a^8d\left(\tan\left(\frac{1}{2}\,dx+\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] -2/15*(15*tan(1/2*d*x + 1/2*c)^9 - 30*I*tan(1/2*d*x + 1/2*c)^8 - 140*tan(1/
2*d*x + 1/2*c)^7 + 170*I*tan(1/2*d*x + 1/2*c)^6 + 282*tan(1/2*d*x + 1/2*c)^
5 - 170*I*tan(1/2*d*x + 1/2*c)^4 - 140*tan(1/2*d*x + 1/2*c)^3 + 30*I*tan(1/
2*d*x + 1/2*c)^2 + 15*tan(1/2*d*x + 1/2*c))/(a^8*d*(tan(1/2*d*x + 1/2*c) -
I)^10)
```

maple [A] time = 0.52, size = 49, normalized size = 0.60

$$\frac{-\frac{i}{(\tan(dx+c)-i)^4}-\frac{1}{3(\tan(dx+c)-i)^3}+\frac{4}{5(\tan(dx+c)-i)^5}}{d\,a^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/d/a^8*(-I/(tan(d*x+c)-I)^4-1/3/(tan(d*x+c)-I)^3+4/5/(tan(d*x+c)-I)^5)
```

maxima [B] time = 0.34, size = 142, normalized size = 1.75

$$-\frac{35\,\tan\left(dx+c\right)^4-35i\,\tan\left(dx+c\right)^3+21\,\tan\left(dx+c\right)^2-7i\,\tan}{\left(105\,a^8\tan\left(dx+c\right)^7-735i\,a^8\tan\left(dx+c\right)^6-2205\,a^8\tan\left(dx+c\right)^5+3675i\,a^8\tan\left(dx+c\right)^4+3675\,a^8\tan\left(dx+\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] -(35*tan(d*x + c)^4 - 35*I*tan(d*x + c)^3 + 21*tan(d*x + c)^2 - 7*I*tan(d*x
 + c) + 14)/((105*a^8*tan(d*x + c)^7 - 735*I*a^8*tan(d*x + c)^6 - 2205*a^8*
tan(d*x + c)^5 + 3675*I*a^8*tan(d*x + c)^4 + 3675*a^8*tan(d*x + c)^3 - 2205
*I*a^8*tan(d*x + c)^2 - 735*a^8*tan(d*x + c) + 105*I*a^8)*d)
```

mupad [B] time = 3.50, size = 85, normalized size = 1.05

$$\frac{-\tan\left(c+d\,x\right)^2\,5\mathrm{i}+5\,\tan\left(c+d\,x\right)+2\mathrm{i}}{15\,a^8\,d\,\left(\tan\left(c+d\,x\right)^5\,1\mathrm{i}+5\,\tan\left(c+d\,x\right)^4-\tan\left(c+d\,x\right)^3\,10\mathrm{i}-10\,\tan\left(c+d\,x\right)^2+\tan\left(c+d\,x\right)\,5\mathrm{i}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^8),x)
```

```
[Out] (5*tan(c + d*x) - tan(c + d*x)^2*5i + 2i)/(15*a^8*d*(tan(c + d*x)*5i - 10*t
an(c + d*x)^2 - tan(c + d*x)^3*10i + 5*tan(c + d*x)^4 + tan(c + d*x)^5*1i +
 1))
```

sympy [A] time = 36.10, size = 466, normalized size = 5.75

$$\begin{cases} -\frac{i\tan^2(c+dx)\sec^6(c+dx)}{240a^8d\tan^8(c+dx)-1920ia^8d\tan^7(c+dx)-6720a^8d\tan^6(c+dx)+13440ia^8d\tan^5(c+dx)+16800a^8d\tan^4(c+dx)-13440ia^8d\tan^3(c+dx)-6720a^8 \\ \frac{x\sec^6(c)}{(ia\tan(c)+a)^8} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6/(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Piecewise((-I*tan(c + d*x)**2*sec(c + d*x)**6/(240*a**8*d*tan(c + d*x)**8 -
 1920*I*a**8*d*tan(c + d*x)**7 - 6720*a**8*d*tan(c + d*x)**6 + 13440*I*a**8
*d*tan(c + d*x)**5 + 16800*a**8*d*tan(c + d*x)**4 - 13440*I*a**8*d*tan(c +
d*x)**3 - 6720*a**8*d*tan(c + d*x)**2 + 1920*I*a**8*d*tan(c + d*x) + 240*a*
*8*d) - 8*tan(c + d*x)*sec(c + d*x)**6/(240*a**8*d*tan(c + d*x)**8 - 1920*I
*a**8*d*tan(c + d*x)**7 - 6720*a**8*d*tan(c + d*x)**6 + 13440*I*a**8*d*tan(
c + d*x)**5 + 16800*a**8*d*tan(c + d*x)**4 - 13440*I*a**8*d*tan(c + d*x)**3
 - 6720*a**8*d*tan(c + d*x)**2 + 1920*I*a**8*d*tan(c + d*x) + 240*a**8*d) +
 31*I*sec(c + d*x)**6/(240*a**8*d*tan(c + d*x)**8 - 1920*I*a**8*d*tan(c + d
*x)**7 - 6720*a**8*d*tan(c + d*x)**6 + 13440*I*a**8*d*tan(c + d*x)**5 + 168
00*a**8*d*tan(c + d*x)**4 - 13440*I*a**8*d*tan(c + d*x)**3 - 6720*a**8*d*ta
n(c + d*x)**2 + 1920*I*a**8*d*tan(c + d*x) + 240*a**8*d), Ne(d, 0)), (x*sec
(c)**6/(I*a*tan(c) + a)**8, True))
```

3.171 $\int \frac{\sec^4(c+dx)}{(a+ia\tan(c+dx))^8}\,dx$

Optimal. Leaf size=55

$$\frac{i}{3a^2d(a+ia\tan(c+dx))^6}-\frac{i}{5a^3d(a+ia\tan(c+dx))^5}$$

```
[Out] 1/3*I/a^2/d/(a+I*a*tan(d*x+c))^6-1/5*I/a^3/d/(a+I*a*tan(d*x+c))^5
```

Rubi [A] time = 0.05, antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{i}{3a^2d(a+ia\tan(c+dx))^6}-\frac{i}{5a^3d(a+ia\tan(c+dx))^5}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (I/3)/(a^2*d*(a + I*a*Tan[c + d*x])^6) - (I/5)/(a^3*d*(a + I*a*Tan[c + d*x]
)^5)
```

Rule 43

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^4(c+dx)}{(a+ia\tan(c+dx))^8}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{a-x}{(a+x)^7}\,dx, x, ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(\frac{2a}{(a+x)^7}-\frac{1}{(a+x)^6}\right)dx, x, ia\tan(c+dx)\right)}{a^3d}\\ &= \frac{i}{3a^2d(a+ia\tan(c+dx))^6}-\frac{i}{5a^3d(a+ia\tan(c+dx))^5}\end{aligned}$$

Mathematica [A] time = 0.27, size = 78, normalized size = 1.42

$$\frac{i\sec^8(c+dx)(16i\sin(2(c+dx))+10i\sin(4(c+dx))+64\cos(2(c+dx))+20\cos(4(c+dx))+45)}{960a^8d(\tan(c+dx)-i)^8}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((I/960)*Sec[c + d*x]^8*(45 + 64*Cos[2*(c + d*x)] + 20*Cos[4*(c + d*x)] + (
16*I)*Sin[2*(c + d*x)] + (10*I)*Sin[4*(c + d*x)]))/(a^8*d*(-I + Tan[c + d*x
])^8)
```

fricas [A] time = 0.70, size = 63, normalized size = 1.15

$$\frac{\left(15i\,e^{(8i\,dx+8i\,c)}+40i\,e^{(6i\,dx+6i\,c)}+45i\,e^{(4i\,dx+4i\,c)}+24i\,e^{(2i\,dx+2i\,c)}+5i\right)e^{(-12i\,dx-12i\,c)}}{960\,a^8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/960*(15*I*e^(8*I*d*x + 8*I*c) + 40*I*e^(6*I*d*x + 6*I*c) + 45*I*e^(4*I*d*
x + 4*I*c) + 24*I*e^(2*I*d*x + 2*I*c) + 5*I)*e^(-12*I*d*x - 12*I*c)/(a^8*d)
```

giac [B] time = 3.39, size = 163, normalized size = 2.96

$$-\frac{2\left(15\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{11}-60i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{10}-235\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{9}+480i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{8}+822\,\tan\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] -2/15*(15*tan(1/2*d*x + 1/2*c)^11 - 60*I*tan(1/2*d*x + 1/2*c)^10 - 235*tan(
1/2*d*x + 1/2*c)^9 + 480*I*tan(1/2*d*x + 1/2*c)^8 + 822*tan(1/2*d*x + 1/2*c
)^7 - 904*I*tan(1/2*d*x + 1/2*c)^6 - 822*tan(1/2*d*x + 1/2*c)^5 + 480*I*tan
(1/2*d*x + 1/2*c)^4 + 235*tan(1/2*d*x + 1/2*c)^3 - 60*I*tan(1/2*d*x + 1/2*c
)^2 - 15*tan(1/2*d*x + 1/2*c))/(a^8*d*(tan(1/2*d*x + 1/2*c) - I)^12)
```

maple [A] time = 0.49, size = 36, normalized size = 0.65

$$\frac{-\frac{i}{3(\tan(dx+c)-i)^6}-\frac{1}{5(\tan(dx+c)-i)^5}}{d\,a^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/d/a^8*(-1/3*I/(tan(d*x+c)-I)^6-1/5/(tan(d*x+c)-I)^5)
```

maxima [B] time = 0.48, size = 122, normalized size = 2.22

$$-\frac{7\left(3\,\tan\left(dx+c\right)^{2}-i\,\tan\left(dx+c\right)+2\right)}{\left(105\,a^{8}\tan\left(dx+c\right)^{7}-735i\,a^{8}\tan\left(dx+c\right)^{6}-2205\,a^{8}\tan\left(dx+c\right)^{5}+3675i\,a^{8}\tan\left(dx+c\right)^{4}+3675\,a^{8}\tan\left(d\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] -7*(3*tan(d*x + c)^2 - I*tan(d*x + c) + 2)/((105*a^8*tan(d*x + c)^7 - 735*I
*a^8*tan(d*x + c)^6 - 2205*a^8*tan(d*x + c)^5 + 3675*I*a^8*tan(d*x + c)^4 +
 3675*a^8*tan(d*x + c)^3 - 2205*I*a^8*tan(d*x + c)^2 - 735*a^8*tan(d*x + c)
 + 105*I*a^8)*d)
```

mupad [B] time = 3.50, size = 85, normalized size = 1.55

$$-\frac{-2+\tan\left(c+d\,x\right)\,3\mathrm{i}}{15\,a^{8}\,d\,\left(\tan\left(c+d\,x\right)^{6}\,1\mathrm{i}+6\,\tan\left(c+d\,x\right)^{5}-\tan\left(c+d\,x\right)^{4}\,15\mathrm{i}-20\,\tan\left(c+d\,x\right)^{3}+\tan\left(c+d\,x\right)^{2}\,15\mathrm{i}+6\,\tan\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^8),x)
```

```
[Out] -(tan(c + d*x)*3i - 2)/(15*a^8*d*(6*tan(c + d*x) + tan(c + d*x)^2*15i - 20*
tan(c + d*x)^3 - tan(c + d*x)^4*15i + 6*tan(c + d*x)^5 + tan(c + d*x)^6*1i
- 1i))
```

sympy [A] time = 36.70, size = 774, normalized size = 14.07

$$\begin{cases} \frac{i\tan^4(c+dx)\sec^4(c+dx)}{960a^8d\tan^8(c+dx)-7680ia^8d\tan^7(c+dx)-26880a^8d\tan^6(c+dx)+53760ia^8d\tan^5(c+dx)+67200a^8d\tan^4(c+dx)-53760ia^8d\tan^3(c+dx)-26880a^8d\ \mathrm{ta}} \\ \frac{x\sec^4(c)}{(ia\tan(c)+a)^8} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4/(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Piecewise((I*tan(c + d*x)**4*sec(c + d*x)**4/(960*a**8*d*tan(c + d*x)**8 -
7680*I*a**8*d*tan(c + d*x)**7 - 26880*a**8*d*tan(c + d*x)**6 + 53760*I*a**8
*d*tan(c + d*x)**5 + 67200*a**8*d*tan(c + d*x)**4 - 53760*I*a**8*d*tan(c +
d*x)**3 - 26880*a**8*d*tan(c + d*x)**2 + 7680*I*a**8*d*tan(c + d*x) + 960*a
**8*d) + 8*tan(c + d*x)**3*sec(c + d*x)**4/(960*a**8*d*tan(c + d*x)**8 - 76
80*I*a**8*d*tan(c + d*x)**7 - 26880*a**8*d*tan(c + d*x)**6 + 53760*I*a**8*d
*tan(c + d*x)**5 + 67200*a**8*d*tan(c + d*x)**4 - 53760*I*a**8*d*tan(c + d*
x)**3 - 26880*a**8*d*tan(c + d*x)**2 + 7680*I*a**8*d*tan(c + d*x) + 960*a**
8*d) - 30*I*tan(c + d*x)**2*sec(c + d*x)**4/(960*a**8*d*tan(c + d*x)**8 - 7
680*I*a**8*d*tan(c + d*x)**7 - 26880*a**8*d*tan(c + d*x)**6 + 53760*I*a**8*
d*tan(c + d*x)**5 + 67200*a**8*d*tan(c + d*x)**4 - 53760*I*a**8*d*tan(c + d
*x)**3 - 26880*a**8*d*tan(c + d*x)**2 + 7680*I*a**8*d*tan(c + d*x) + 960*a*
*8*d) - 72*tan(c + d*x)*sec(c + d*x)**4/(960*a**8*d*tan(c + d*x)**8 - 7680*
I*a**8*d*tan(c + d*x)**7 - 26880*a**8*d*tan(c + d*x)**6 + 53760*I*a**8*d*ta
n(c + d*x)**5 + 67200*a**8*d*tan(c + d*x)**4 - 53760*I*a**8*d*tan(c + d*x)*
*3 - 26880*a**8*d*tan(c + d*x)**2 + 7680*I*a**8*d*tan(c + d*x) + 960*a**8*d
) + 129*I*sec(c + d*x)**4/(960*a**8*d*tan(c + d*x)**8 - 7680*I*a**8*d*tan(c
 + d*x)**7 - 26880*a**8*d*tan(c + d*x)**6 + 53760*I*a**8*d*tan(c + d*x)**5
+ 67200*a**8*d*tan(c + d*x)**4 - 53760*I*a**8*d*tan(c + d*x)**3 - 26880*a**
8*d*tan(c + d*x)**2 + 7680*I*a**8*d*tan(c + d*x) + 960*a**8*d), Ne(d, 0)),
(x*sec(c)**4/(I*a*tan(c) + a)**8, True))
```

3.172 $\int \frac{\sec^2(c+dx)}{(a+ia\tan(c+dx))^8}\,dx$

Optimal. Leaf size=27

$$\frac{i}{7ad(a+ia\tan(c+dx))^7}$$

```
[Out] 1/7*I/a/d/(a+I*a*tan(d*x+c))^7
```

Rubi [A] time = 0.04, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 32}

$$\frac{i}{7ad(a+ia\tan(c+dx))^7}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (I/7)/(a*d*(a + I*a*Tan[c + d*x])^7)
```

Rule 32

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^2(c+dx)}{(a+ia\tan(c+dx))^8}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{1}{(a+x)^8}\,dx, x, ia\tan(c+dx)\right)}{ad}\\ &= \frac{i}{7ad(a+ia\tan(c+dx))^7}\end{aligned}$$

Mathematica [B] time = 0.31, size = 100, normalized size = 3.70

$$\frac{i\sec^8(c+dx)(14i\sin(2(c+dx))+14i\sin(4(c+dx))+6i\sin(6(c+dx))+56\cos(2(c+dx))+28\cos(4(c+dx}{896a^8d(\tan(c+dx)-i)^8}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((I/896)*Sec[c + d*x]^8*(35 + 56*Cos[2*(c + d*x)] + 28*Cos[4*(c + d*x)] + 8
*Cos[6*(c + d*x)] + (14*I)*Sin[2*(c + d*x)] + (14*I)*Sin[4*(c + d*x)] + (6*
I)*Sin[6*(c + d*x)]))/(a^8*d*(-I + Tan[c + d*x])^8)
```

fricas [B] time = 0.80, size = 85, normalized size = 3.15

$$\frac{\left(7i\,e^{(12i\,dx+12i\,c)}+21i\,e^{(10i\,dx+10i\,c)}+35i\,e^{(8i\,dx+8i\,c)}+35i\,e^{(6i\,dx+6i\,c)}+21i\,e^{(4i\,dx+4i\,c)}+7i\,e^{(2i\,dx+2i\,c)}+i\right)e^{(-14i\,dx-14i}}{896\,a^8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/896*(7*I*e^(12*I*d*x + 12*I*c) + 21*I*e^(10*I*d*x + 10*I*c) + 35*I*e^(8*I
*d*x + 8*I*c) + 35*I*e^(6*I*d*x + 6*I*c) + 21*I*e^(4*I*d*x + 4*I*c) + 7*I*e
^(2*I*d*x + 2*I*c) + I)*e^(-14*I*d*x - 14*I*c)/(a^8*d)
```

giac [B] time = 3.58, size = 189, normalized size = 7.00

$$-\frac{2\left(7\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^{13}-42i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^{12}-182\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^{11}+490i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^{10}+1001\tan\left(\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] -2/7*(7*tan(1/2*d*x + 1/2*c)^13 - 42*I*tan(1/2*d*x + 1/2*c)^12 - 182*tan(1/
2*d*x + 1/2*c)^11 + 490*I*tan(1/2*d*x + 1/2*c)^10 + 1001*tan(1/2*d*x + 1/2*
c)^9 - 1484*I*tan(1/2*d*x + 1/2*c)^8 - 1716*tan(1/2*d*x + 1/2*c)^7 + 1484*I
*tan(1/2*d*x + 1/2*c)^6 + 1001*tan(1/2*d*x + 1/2*c)^5 - 490*I*tan(1/2*d*x +
 1/2*c)^4 - 182*tan(1/2*d*x + 1/2*c)^3 + 42*I*tan(1/2*d*x + 1/2*c)^2 + 7*ta
n(1/2*d*x + 1/2*c))/(a^8*d*(tan(1/2*d*x + 1/2*c) - I)^14)
```

maple [A] time = 0.29, size = 24, normalized size = 0.89

$$\frac{i}{7ad\left(a+ia\tan\left(dx+c\right)\right)^{7}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/7*I/a/d/(a+I*a*tan(d*x+c))^7
```

maxima [A] time = 0.54, size = 21, normalized size = 0.78

$$\frac{i}{7\left(i\,a\tan\left(dx+c\right)+a\right)^{7}ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] 1/7*I/((I*a*tan(d*x + c) + a)^7*a*d)
```

mupad [B] time = 3.56, size = 19, normalized size = 0.70

$$-\frac{1}{7\,a^8\,d\,{\left(\mathrm{tan}\left(c+d\,x\right)-\mathrm{i}\right)}^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^8),x)
```

```
[Out] -1/(7*a^8*d*(tan(c + d*x) - 1i)^7)
```

sympy [A] time = 36.83, size = 1081, normalized size = 40.04

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2/(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Piecewise((-I*tan(c + d*x)**6*sec(c + d*x)**2/(896*a**8*d*tan(c + d*x)**8 -
 7168*I*a**8*d*tan(c + d*x)**7 - 25088*a**8*d*tan(c + d*x)**6 + 50176*I*a**
8*d*tan(c + d*x)**5 + 62720*a**8*d*tan(c + d*x)**4 - 50176*I*a**8*d*tan(c +
 d*x)**3 - 25088*a**8*d*tan(c + d*x)**2 + 7168*I*a**8*d*tan(c + d*x) + 896*
a**8*d) - 8*tan(c + d*x)**5*sec(c + d*x)**2/(896*a**8*d*tan(c + d*x)**8 - 7
168*I*a**8*d*tan(c + d*x)**7 - 25088*a**8*d*tan(c + d*x)**6 + 50176*I*a**8*
d*tan(c + d*x)**5 + 62720*a**8*d*tan(c + d*x)**4 - 50176*I*a**8*d*tan(c + d
*x)**3 - 25088*a**8*d*tan(c + d*x)**2 + 7168*I*a**8*d*tan(c + d*x) + 896*a*
*8*d) + 29*I*tan(c + d*x)**4*sec(c + d*x)**2/(896*a**8*d*tan(c + d*x)**8 -
7168*I*a**8*d*tan(c + d*x)**7 - 25088*a**8*d*tan(c + d*x)**6 + 50176*I*a**8
*d*tan(c + d*x)**5 + 62720*a**8*d*tan(c + d*x)**4 - 50176*I*a**8*d*tan(c +
d*x)**3 - 25088*a**8*d*tan(c + d*x)**2 + 7168*I*a**8*d*tan(c + d*x) + 896*a
**8*d) + 64*tan(c + d*x)**3*sec(c + d*x)**2/(896*a**8*d*tan(c + d*x)**8 - 7
168*I*a**8*d*tan(c + d*x)**7 - 25088*a**8*d*tan(c + d*x)**6 + 50176*I*a**8*
d*tan(c + d*x)**5 + 62720*a**8*d*tan(c + d*x)**4 - 50176*I*a**8*d*tan(c + d
*x)**3 - 25088*a**8*d*tan(c + d*x)**2 + 7168*I*a**8*d*tan(c + d*x) + 896*a*
*8*d) - 99*I*tan(c + d*x)**2*sec(c + d*x)**2/(896*a**8*d*tan(c + d*x)**8 -
7168*I*a**8*d*tan(c + d*x)**7 - 25088*a**8*d*tan(c + d*x)**6 + 50176*I*a**8
*d*tan(c + d*x)**5 + 62720*a**8*d*tan(c + d*x)**4 - 50176*I*a**8*d*tan(c +
d*x)**3 - 25088*a**8*d*tan(c + d*x)**2 + 7168*I*a**8*d*tan(c + d*x) + 896*a
**8*d) - 120*tan(c + d*x)*sec(c + d*x)**2/(896*a**8*d*tan(c + d*x)**8 - 716
8*I*a**8*d*tan(c + d*x)**7 - 25088*a**8*d*tan(c + d*x)**6 + 50176*I*a**8*d*
tan(c + d*x)**5 + 62720*a**8*d*tan(c + d*x)**4 - 50176*I*a**8*d*tan(c + d*x
)**3 - 25088*a**8*d*tan(c + d*x)**2 + 7168*I*a**8*d*tan(c + d*x) + 896*a**8
*d) + 127*I*sec(c + d*x)**2/(896*a**8*d*tan(c + d*x)**8 - 7168*I*a**8*d*tan
(c + d*x)**7 - 25088*a**8*d*tan(c + d*x)**6 + 50176*I*a**8*d*tan(c + d*x)**
5 + 62720*a**8*d*tan(c + d*x)**4 - 50176*I*a**8*d*tan(c + d*x)**3 - 25088*a
**8*d*tan(c + d*x)**2 + 7168*I*a**8*d*tan(c + d*x) + 896*a**8*d), Ne(d, 0))
, (x*sec(c)**2/(I*a*tan(c) + a)**8, True))
```

3.173 $\int \frac{1}{(a+ia\tan(c+dx))^8}\,dx$

Optimal. Leaf size=229

$$\frac{i}{256d\left(a^8+ia^8\tan(c+dx)\right)}+\frac{x}{256a^8}+\frac{i}{256d\left(a^4+ia^4\tan(c+dx)\right)^2}+\frac{i}{80a^3d(a+ia\tan(c+dx))^5}+\frac{i}{192a^2d\left(a^2+ia^2\right.}$$

```
[Out] 1/256*x/a^8+1/16*I/d/(a+I*a*tan(d*x+c))^8+1/28*I/a/d/(a+I*a*tan(d*x+c))^7+1
/48*I/a^2/d/(a+I*a*tan(d*x+c))^6+1/80*I/a^3/d/(a+I*a*tan(d*x+c))^5+1/128*I/
d/(a^2+I*a^2*tan(d*x+c))^4+1/192*I/a^2/d/(a^2+I*a^2*tan(d*x+c))^3+1/256*I/d
/(a^4+I*a^4*tan(d*x+c))^2+1/256*I/d/(a^8+I*a^8*tan(d*x+c))
```

Rubi [A] time = 0.15, antiderivative size = 229, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 2, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {3479, 8}

$$\frac{i}{256d\left(a^8+ia^8\tan(c+dx)\right)}+\frac{i}{256d\left(a^4+ia^4\tan(c+dx)\right)^2}+\frac{i}{192a^2d\left(a^2+ia^2\tan(c+dx)\right)^3}+\frac{i}{128d\left(a^2+ia^2\tan(c\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^(-8),x]
```

```
[Out] x/(256*a^8) + (I/16)/(d*(a + I*a*Tan[c + d*x])^8) + (I/28)/(a*d*(a + I*a*Ta
n[c + d*x])^7) + (I/48)/(a^2*d*(a + I*a*Tan[c + d*x])^6) + (I/80)/(a^3*d*(a
 + I*a*Tan[c + d*x])^5) + (I/128)/(d*(a^2 + I*a^2*Tan[c + d*x])^4) + (I/192
)/(a^2*d*(a^2 + I*a^2*Tan[c + d*x])^3) + (I/256)/(d*(a^4 + I*a^4*Tan[c + d*
x])^2) + (I/256)/(d*(a^8 + I*a^8*Tan[c + d*x]))
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 3479

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

Rubi steps

$$\int \frac{1}{(a+ia\tan(c+dx))^8}\,dx = \frac{i}{16d(a+ia\tan(c+dx))^8} + \frac{\int \frac{1}{(a+ia\tan(c+dx))^7}\,dx}{2a}$$
$$= \frac{i}{16d(a+ia\tan(c+dx))^8} + \frac{i}{28ad(a+ia\tan(c+dx))^7} + \frac{\int \frac{1}{(a+ia\tan(c+dx))^6}\,dx}{4a^2}$$
$$= \frac{i}{16d(a+ia\tan(c+dx))^8} + \frac{i}{28ad(a+ia\tan(c+dx))^7} + \frac{i}{48a^2d(a+ia\tan(c+dx)}$$
$$= \frac{i}{16d(a+ia\tan(c+dx))^8} + \frac{i}{28ad(a+ia\tan(c+dx))^7} + \frac{i}{48a^2d(a+ia\tan(c+dx)}$$
$$= \frac{i}{16d(a+ia\tan(c+dx))^8} + \frac{i}{28ad(a+ia\tan(c+dx))^7} + \frac{i}{48a^2d(a+ia\tan(c+dx)}$$
$$= \frac{i}{16d(a+ia\tan(c+dx))^8} + \frac{i}{28ad(a+ia\tan(c+dx))^7} + \frac{i}{48a^2d(a+ia\tan(c+dx)}$$
$$= \frac{i}{16d(a+ia\tan(c+dx))^8} + \frac{i}{28ad(a+ia\tan(c+dx))^7} + \frac{i}{48a^2d(a+ia\tan(c+dx)}$$
$$= \frac{i}{16d(a+ia\tan(c+dx))^8} + \frac{i}{28ad(a+ia\tan(c+dx))^7} + \frac{i}{48a^2d(a+ia\tan(c+dx)}$$
$$= \frac{x}{256a^8} + \frac{i}{16d(a+ia\tan(c+dx))^8} + \frac{i}{28ad(a+ia\tan(c+dx))^7} + \frac{i}{48a^2d(a+ia\,\mathrm{ta}}$$

Mathematica [A] time = 0.72, size = 148, normalized size = 0.65

$$\frac{\sec^8(c+dx)(-6272\sin(2(c+dx)) - 7840\sin(4(c+dx)) - 5760\sin(6(c+dx)) + 1680idx\sin(8(c+dx)) + 105}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^(-8),x]
```

```
[Out] (Sec[c + d*x]^8*(14700*I + (25088*I)*Cos[2*(c + d*x)] + (15680*I)*Cos[4*(c
+ d*x)] + (7680*I)*Cos[6*(c + d*x)] + (105*I)*Cos[8*(c + d*x)] + 1680*d*x*C
os[8*(c + d*x)] - 6272*Sin[2*(c + d*x)] - 7840*Sin[4*(c + d*x)] - 5760*Sin[
6*(c + d*x)] + 105*Sin[8*(c + d*x)] + (1680*I)*d*x*Sin[8*(c + d*x)]))/(4300
80*a^8*d*(-I + Tan[c + d*x])^8)
```

fricas [A] time = 0.69, size = 109, normalized size = 0.48

$$\frac{\left(1680\,dxe^{(16i\,dx+16i\,c)} + 6720i\,e^{(14i\,dx+14i\,c)} + 11760i\,e^{(12i\,dx+12i\,c)} + 15680i\,e^{(10i\,dx+10i\,c)} + 14700i\,e^{(8i\,dx+8i\,c)} + 9408}{430080\,a^8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/430080*(1680*d*x*e^(16*I*d*x + 16*I*c) + 6720*I*e^(14*I*d*x + 14*I*c) + 1
1760*I*e^(12*I*d*x + 12*I*c) + 15680*I*e^(10*I*d*x + 10*I*c) + 14700*I*e^(8
*I*d*x + 8*I*c) + 9408*I*e^(6*I*d*x + 6*I*c) + 3920*I*e^(4*I*d*x + 4*I*c) +
 960*I*e^(2*I*d*x + 2*I*c) + 105*I)*e^(-16*I*d*x - 16*I*c)/(a^8*d)
```

giac [A] time = 1.60, size = 132, normalized size = 0.58

$$-\frac{-\frac{840i\log(-i\tan(dx+c)+1)}{a^8}+\frac{840i\log(-i\tan(dx+c)-1)}{a^8}+\frac{-2283i\tan(dx+c)^8-19944\tan(dx+c)^7+77364i\tan(dx+c)^6+175448\tan(dx+c)^5-258\cdots}{a^8(\tan(\cdots}}{430080\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] -1/430080*(-840*I*log(-I*tan(d*x + c) + 1)/a^8 + 840*I*log(-I*tan(d*x + c)
- 1)/a^8 + (-2283*I*tan(d*x + c)^8 - 19944*tan(d*x + c)^7 + 77364*I*tan(d*x
 + c)^6 + 175448*tan(d*x + c)^5 - 258370*I*tan(d*x + c)^4 - 261464*tan(d*x
+ c)^3 + 192052*I*tan(d*x + c)^2 + 114152*tan(d*x + c) - 67819*I)/(a^8*(tan
(d*x + c) - I)^8))/d
```

maple [A] time = 0.11, size = 196, normalized size = 0.86

$$\frac{i\ln(\tan(dx+c)+i)}{512d\,a^8}+\frac{i}{16d\,a^8(\tan(dx+c)-i)^8}+\frac{i}{128d\,a^8(\tan(dx+c)-i)^4}-\frac{i\ln(\tan(dx+c)-i)}{512a^8d}-\frac{i}{48d\,a^8(\tan(\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/512*I/d/a^8*ln(tan(d*x+c)+I)+1/16*I/d/a^8/(tan(d*x+c)-I)^8+1/128*I/d/a^8/
(tan(d*x+c)-I)^4-1/512*I/d/a^8*ln(tan(d*x+c)-I)-1/48*I/d/a^8/(tan(d*x+c)-I)
^6-1/256*I/d/a^8/(tan(d*x+c)-I)^2-1/28/d/a^8/(tan(d*x+c)-I)^7+1/80/d/a^8/(t
an(d*x+c)-I)^5-1/192/a^8/d/(tan(d*x+c)-I)^3+1/256/a^8/d/(tan(d*x+c)-I)
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 4.96, size = 198, normalized size = 0.86

$$\frac{x}{256\,a^8}-\frac{\frac{\tan(c+d\,x)\,5993\mathrm{i}}{26880\,a^8}+\frac{16}{105\,a^8}-\frac{143\tan(c+d\,x)^2}{480\,a^8}-\frac{\tan(c+d\,x)^3\,1193\mathrm{i}}{3840\,a^8}+\frac{11\tan(c+d\,x)^4}{48\,a^8}+\frac{\tan(c+d\,x)^5\,85\cdots}{768\,a^8}}{d\left(\tan(c+d\,x)^8\,1\mathrm{i}+8\tan(c+d\,x)^7-\tan(c+d\,x)^6\,28\mathrm{i}-56\tan(c+d\,x)^5+\tan(c+d\,x)^4\,70\mathrm{i}+56\tan\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] x/(256*a^8) - ((tan(c + d*x)*5993i)/(26880*a^8) + 16/(105*a^8) - (143*tan(c
 + d*x)^2)/(480*a^8) - (tan(c + d*x)^3*1193i)/(3840*a^8) + (11*tan(c + d*x)
^4)/(48*a^8) + (tan(c + d*x)^5*85i)/(768*a^8) - tan(c + d*x)^6/(32*a^8) - (
tan(c + d*x)^7*1i)/(256*a^8))/(d*(56*tan(c + d*x)^3 - tan(c + d*x)^2*28i -
8*tan(c + d*x) + tan(c + d*x)^4*70i - 56*tan(c + d*x)^5 - tan(c + d*x)^6*28
i + 8*tan(c + d*x)^7 + tan(c + d*x)^8*1i + 1i))
```

sympy [A] time = 0.75, size = 326, normalized size = 1.42

$$\begin{cases}\frac{(226981421219472998400ia^{56}d^7e^{70ic}e^{-2idx}+397217487134077747200ia^{56}d^7e^{68ic}e^{-4idx}+529623316178770329600ia^{56}d^7e^{66ic}e^{-6idx}+4965218589175971\cdots}{\cdots} \\ x\left(\frac{(e^{16ic}+8e^{14ic}+28e^{12ic}+56e^{10ic}+70e^{8ic}+56e^{6ic}+28e^{4ic}+8e^{2ic}+1)e^{-16ic}}{256a^8}-\frac{1}{256a^8}\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Piecewise(((22698142121947299840*I*a**56*d**7*exp(70*I*c)*exp(-2*I*d*x) + 3
9721748713407774720*I*a**56*d**7*exp(68*I*c)*exp(-4*I*d*x) + 52962331617877
032960*I*a**56*d**7*exp(66*I*c)*exp(-6*I*d*x) + 49652185891759718400*I*a**5
6*d**7*exp(64*I*c)*exp(-8*I*d*x) + 31777398970726219776*I*a**56*d**7*exp(62
*I*c)*exp(-10*I*d*x) + 13240582904469258240*I*a**56*d**7*exp(60*I*c)*exp(-1
2*I*d*x) + 3242591731706757120*I*a**56*d**7*exp(58*I*c)*exp(-14*I*d*x) + 35
4658470655426560*I*a**56*d**7*exp(56*I*c)*exp(-16*I*d*x))*exp(-72*I*c)/(145
2681095804627189760*a**64*d**8), Ne(1452681095804627189760*a**64*d**8*exp(7
2*I*c), 0)), (x*((exp(16*I*c) + 8*exp(14*I*c) + 28*exp(12*I*c) + 56*exp(10*
I*c) + 70*exp(8*I*c) + 56*exp(6*I*c) + 28*exp(4*I*c) + 8*exp(2*I*c) + 1)*ex
p(-16*I*c)/(256*a**8) - 1/(256*a**8)), True)) + x/(256*a**8)
```

3.174 $\int \frac{\cos^2(c+dx)}{(a+ia\tan(c+dx))^8}\,dx$

Optimal. Leaf size=278

$$-\frac{i}{1024d\left(a^8-ia^8\tan(c+dx)\right)}+\frac{9i}{1024d\left(a^8+ia^8\tan(c+dx)\right)}+\frac{5x}{512a^8}+\frac{7i}{768a^5d(a+ia\tan(c+dx))^3}+\frac{}{128d\left(a^4+ia\right.}$$

```
[Out] 5/512*x/a^8+1/36*I*a/d/(a+I*a*tan(d*x+c))^9+1/32*I/d/(a+I*a*tan(d*x+c))^8+3
/112*I/a/d/(a+I*a*tan(d*x+c))^7+1/48*I/a^2/d/(a+I*a*tan(d*x+c))^6+1/64*I/a^
3/d/(a+I*a*tan(d*x+c))^5+7/768*I/a^5/d/(a+I*a*tan(d*x+c))^3+3/256*I/d/(a^2+
I*a^2*tan(d*x+c))^4+1/128*I/d/(a^4+I*a^4*tan(d*x+c))^2-1/1024*I/d/(a^8-I*a^
8*tan(d*x+c))+9/1024*I/d/(a^8+I*a^8*tan(d*x+c))
```

Rubi [A] time = 0.14, antiderivative size = 278, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {3487, 44, 206}

$$-\frac{i}{1024d\left(a^8-ia^8\tan(c+dx)\right)}+\frac{9i}{1024d\left(a^8+ia^8\tan(c+dx)\right)}+\frac{i}{128d\left(a^4+ia^4\tan(c+dx)\right)^2}+\frac{3i}{256d\left(a^2+ia^2\tan(c\right.}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (5*x)/(512*a^8) + ((I/36)*a)/(d*(a + I*a*Tan[c + d*x])^9) + (I/32)/(d*(a +
I*a*Tan[c + d*x])^8) + ((3*I)/112)/(a*d*(a + I*a*Tan[c + d*x])^7) + (I/48)/
(a^2*d*(a + I*a*Tan[c + d*x])^6) + (I/64)/(a^3*d*(a + I*a*Tan[c + d*x])^5)
+ ((7*I)/768)/(a^5*d*(a + I*a*Tan[c + d*x])^3) + ((3*I)/256)/(d*(a^2 + I*a^
2*Tan[c + d*x])^4) + (I/128)/(d*(a^4 + I*a^4*Tan[c + d*x])^2) - (I/1024)/(d
*(a^8 - I*a^8*Tan[c + d*x])) + ((9*I)/1024)/(d*(a^8 + I*a^8*Tan[c + d*x]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 206

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^2(c+dx)}{(a+ia\tan(c+dx))^8}\,dx = -\frac{(ia^3)\,\text{Subst}\left(\int \frac{1}{(a-x)^2(a+x)^{10}}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{(ia^3)\,\text{Subst}\left(\int \left(\frac{1}{1024a^{10}(a-x)^2} + \frac{1}{4a^2(a+x)^{10}} + \frac{1}{4a^3(a+x)^9} + \frac{3}{16a^4(a+x)^8} + \frac{1}{8a^5(a+x)^7} + \frac{}{64a}\right.\right.}{}$$

$$= \frac{ia}{36d(a+ia\tan(c+dx))^9} + \frac{i}{32d(a+ia\tan(c+dx))^8} + \frac{3i}{112ad(a+ia\tan(c+dx))}$$

$$= \frac{5x}{512a^8} + \frac{ia}{36d(a+ia\tan(c+dx))^9} + \frac{i}{32d(a+ia\tan(c+dx))^8} + \frac{3i}{112ad(a+ia\tan}$$

Mathematica [A] time = 1.23, size = 170, normalized size = 0.61

$$\frac{\sec^8(c+dx)(-7056\sin(2(c+dx)) - 10080\sin(4(c+dx)) - 9720\sin(6(c+dx)) + 5040idx\sin(8(c+dx)) + 31}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (Sec[c + d*x]^8*(15876*I + (28224*I)*Cos[2*(c + d*x)] + (20160*I)*Cos[4*(c
+ d*x)] + (12960*I)*Cos[6*(c + d*x)] + (315*I)*Cos[8*(c + d*x)] + 5040*d*x*
Cos[8*(c + d*x)] - (224*I)*Cos[10*(c + d*x)] - 7056*Sin[2*(c + d*x)] - 1008
0*Sin[4*(c + d*x)] - 9720*Sin[6*(c + d*x)] + 315*Sin[8*(c + d*x)] + (5040*I
)*d*x*Sin[8*(c + d*x)] + 280*Sin[10*(c + d*x)]))/(516096*a^8*d*(-I + Tan[c
+ d*x])^8)
```

fricas [A] time = 0.67, size = 131, normalized size = 0.47

$$\frac{\left(5040\,dxe^{(18i\,dx+18i\,c)} - 252i\,e^{(20i\,dx+20i\,c)} + 11340i\,e^{(16i\,dx+16i\,c)} + 15120i\,e^{(14i\,dx+14i\,c)} + 17640i\,e^{(12i\,dx+12i\,c)} + 1587\right.}{516096}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/516096*(5040*d*x*e^(18*I*d*x + 18*I*c) - 252*I*e^(20*I*d*x + 20*I*c) + 11
340*I*e^(16*I*d*x + 16*I*c) + 15120*I*e^(14*I*d*x + 14*I*c) + 17640*I*e^(12
*I*d*x + 12*I*c) + 15876*I*e^(10*I*d*x + 10*I*c) + 10584*I*e^(8*I*d*x + 8*I
*c) + 5040*I*e^(6*I*d*x + 6*I*c) + 1620*I*e^(4*I*d*x + 4*I*c) + 315*I*e^(2*
I*d*x + 2*I*c) + 28*I)*e^(-18*I*d*x - 18*I*c)/(a^8*d)
```

giac [A] time = 5.75, size = 163, normalized size = 0.59

$$-\frac{-\frac{2520i\,\log(\tan(dx+c)+i)}{a^8} + \frac{2520i\,\log(\tan(dx+c)-i)}{a^8} + \frac{504\,(5i\,\tan(dx+c)-6)}{a^8(\tan(dx+c)+i)} + \frac{-7129i\,\tan(dx+c)^9 - 68697\,\tan(dx+c)^8 + 296964i\,\tan(dx+c)^7}{}}{516096}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] -1/516096*(-2520*I*log(tan(d*x + c) + I)/a^8 + 2520*I*log(tan(d*x + c) - I)
/a^8 + 504*(5*I*tan(d*x + c) - 6)/(a^8*(tan(d*x + c) + I)) + (-7129*I*tan(d
*x + c)^9 - 68697*tan(d*x + c)^8 + 296964*I*tan(d*x + c)^7 + 758772*tan(d*x
 + c)^6 - 1271214*I*tan(d*x + c)^5 - 1465758*tan(d*x + c)^4 + 1191540*I*tan
```

```
(d*x + c)^3 + 693828*tan(d*x + c)^2 - 295425*I*tan(d*x + c) - 89553)/(a^8*(
tan(d*x + c) - I)^9))/d
```

maple [A] time = 0.45, size = 234, normalized size = 0.84

$$\frac{5i\ln(\tan(dx+c)+i)}{1024d\,a^8}+\frac{1}{1024a^8d(\tan(dx+c)+i)}-\frac{5i\ln(\tan(dx+c)-i)}{1024a^8d}+\frac{3i}{256d\,a^8(\tan(dx+c)-i)^4}+\frac{}{32d\,a^8(\text{t}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 5/1024*I/a^8/d*ln(tan(d*x+c)+I)+1/1024/a^8/d/(tan(d*x+c)+I)-5/1024*I/a^8/d*
ln(tan(d*x+c)-I)+3/256*I/a^8/d/(tan(d*x+c)-I)^4+1/32*I/a^8/d/(tan(d*x+c)-I)
^8-1/48*I/d/a^8/(tan(d*x+c)-I)^6-1/128*I/a^8/d/(tan(d*x+c)-I)^2+1/36/a^8/d/
(tan(d*x+c)-I)^9-3/112/d/a^8/(tan(d*x+c)-I)^7+1/64/d/a^8/(tan(d*x+c)-I)^5-7
/768/a^8/d/(tan(d*x+c)-I)^3+9/1024/a^8/d/(tan(d*x+c)-I)
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 5.29, size = 235, normalized size = 0.85

$$\frac{5\,x}{512\,a^8}+\frac{\frac{163\,\tan(c+d\,x)^2}{448\,a^8}-\frac{10}{63\,a^8}-\frac{\tan(c+d\,x)\,9019\mathrm{i}}{32256\,a^8}+\frac{\tan(c+d\,x)^3\,393\mathrm{i}}{1792\,a^8}+\frac{11\,\tan(c+d\,x)^4}{64\,a^8}+\frac{\tan(c+d\,x)^5\,1\mathrm{i}}{2\,a^8}-\frac{95\,\text{t}}{}}{d\,\left(\tan(c+d\,x)^{10}\,1\mathrm{i}+8\,\tan(c+d\,x)^9-\tan(c+d\,x)^8\,27\mathrm{i}-48\,\tan(c+d\,x)^7+\tan(c+d\,x)^6\,42\mathrm{i}+\tan(c\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2/(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] (5*x)/(512*a^8) + ((163*tan(c + d*x)^2)/(448*a^8) - 10/(63*a^8) - (tan(c +
d*x)*9019i)/(32256*a^8) + (tan(c + d*x)^3*393i)/(1792*a^8) + (11*tan(c + d*
x)^4)/(64*a^8) + (tan(c + d*x)^5*1i)/(2*a^8) - (95*tan(c + d*x)^6)/(192*a^8
) - (tan(c + d*x)^7*205i)/(768*a^8) + (5*tan(c + d*x)^8)/(64*a^8) + (tan(c
+ d*x)^9*5i)/(512*a^8))/(d*(48*tan(c + d*x)^3 - tan(c + d*x)^2*27i - 8*tan(
c + d*x) + tan(c + d*x)^4*42i + tan(c + d*x)^6*42i - 48*tan(c + d*x)^7 - ta
n(c + d*x)^8*27i + 8*tan(c + d*x)^9 + tan(c + d*x)^10*1i + 1i))
```

sympy [A] time = 0.91, size = 396, normalized size = 1.42

$$\begin{cases} \frac{\left(-249568711919932663419663443558 4ia^{72}d^9e^{92ic}e^{2idx}+1123059203639696985388485496012 80ia^{72}d^9e^{88ic}e^{-2idx}+149741227151959598051798066\cdots\right.}{} \\ x\left(\frac{\left(e^{20ic}+10e^{18ic}+45e^{16ic}+120e^{14ic}+210e^{12ic}+252e^{10ic}+210e^{8ic}+120e^{6ic}+45e^{4ic}+10e^{2ic}+1\right)e^{-18ic}}{1024a^8}-\frac{5}{512a^8}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2/(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Piecewise(((-2495687119199326634196634435584*I*a**72*d**9*exp(92*I*c)*exp(2
*I*d*x) + 112305920363969698538848549601280*I*a**72*d**9*exp(88*I*c)*exp(-2
*I*d*x) + 1497412271519595980517980661350 40*I*a**72*d**9*exp(86*I*c)*exp(-4
*I*d*x) + 1746980983439528643937644104908 80*I*a**72*d**9*exp(84*I*c)*exp(-6
```

```
*I*d*x) + 1572282885095575779543879694417 92*I*a**72*d**9*exp(82*I*c)*exp(-8
*I*d*x) + 104818859006371718636258646294528*I*a**72*d**9*exp(80*I*c)*exp(-1
0*I*d*x) + 49913742383986532683932688711680*I*a**72*d**9*exp(78*I*c)*exp(-1
2*I*d*x) + 16043702909138528362692649943040*I*a**72*d**9*exp(76*I*c)*exp(-1
4*I*d*x) + 3119608898999158292745793044480*I*a**72*d**9*exp(74*I*c)*exp(-16
*I*d*x) + 277298568799925181577403826176*I*a**72*d**9*exp(72*I*c)*exp(-18*I
*d*x))*exp(-90*I*c)/(511116722012022094683470732407 6032*a**80*d**10), Ne(51
111672201202209468347073240760 32*a**80*d**10*exp(90*I*c), 0)), (x*((exp(20*
I*c) + 10*exp(18*I*c) + 45*exp(16*I*c) + 120*exp(14*I*c) + 210*exp(12*I*c)
+ 252*exp(10*I*c) + 210*exp(8*I*c) + 120*exp(6*I*c) + 45*exp(4*I*c) + 10*ex
p(2*I*c) + 1)*exp(-18*I*c)/(1024*a**8) - 5/(512*a**8)), True)) + 5*x/(512*a
**8)
```

3.175 $\int \frac{\cos^4(c+dx)}{(a+ia\tan(c+dx))^8}\,dx$

Optimal. Leaf size=333

$$-\frac{11i}{4096d\left(a^8-ia^8\tan(c+dx)\right)}+\frac{55i}{4096d\left(a^8+ia^8\tan(c+dx)\right)}+\frac{33x}{2048a^8}+\frac{3i}{256a^5d(a+ia\tan(c+dx))^3}-\frac{}{4096d\left(a^4-\right.}$$

```
[Out] 33/2048*x/a^8+1/80*I*a^2/d/(a+I*a*tan(d*x+c))^10+1/48*I*a/d/(a+I*a*tan(d*x+
c))^9+3/128*I/d/(a+I*a*tan(d*x+c))^8+5/224*I/a/d/(a+I*a*tan(d*x+c))^7+5/256
*I/a^2/d/(a+I*a*tan(d*x+c))^6+21/1280*I/a^3/d/(a+I*a*tan(d*x+c))^5+3/256*I/
a^5/d/(a+I*a*tan(d*x+c))^3+7/512*I/d/(a^2+I*a^2*tan(d*x+c))^4-1/4096*I/d/(a
^4-I*a^4*tan(d*x+c))^2+45/4096*I/d/(a^4+I*a^4*tan(d*x+c))^2-11/4096*I/d/(a^
8-I*a^8*tan(d*x+c))+55/4096*I/d/(a^8+I*a^8*tan(d*x+c))
```

Rubi [A] time = 0.18, antiderivative size = 333, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3487, 44, 206}

$$\frac{ia^2}{80d(a+ia\tan(c+dx))^{10}}-\frac{11i}{4096d\left(a^8-ia^8\tan(c+dx)\right)}+\frac{55i}{4096d\left(a^8+ia^8\tan(c+dx)\right)}-\frac{i}{4096d\left(a^4-ia^4\tan(c+\right.}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (33*x)/(2048*a^8) + ((I/80)*a^2)/(d*(a + I*a*Tan[c + d*x])^10) + ((I/48)*a)
/(d*(a + I*a*Tan[c + d*x])^9) + ((3*I)/128)/(d*(a + I*a*Tan[c + d*x])^8) +
((5*I)/224)/(a*d*(a + I*a*Tan[c + d*x])^7) + ((5*I)/256)/(a^2*d*(a + I*a*Ta
n[c + d*x])^6) + ((21*I)/1280)/(a^3*d*(a + I*a*Tan[c + d*x])^5) + ((3*I)/25
6)/(a^5*d*(a + I*a*Tan[c + d*x])^3) + ((7*I)/512)/(d*(a^2 + I*a^2*Tan[c + d
*x])^4) - (I/4096)/(d*(a^4 - I*a^4*Tan[c + d*x])^2) + ((45*I)/4096)/(d*(a^4
 + I*a^4*Tan[c + d*x])^2) - ((11*I)/4096)/(d*(a^8 - I*a^8*Tan[c + d*x])) +
((55*I)/4096)/(d*(a^8 + I*a^8*Tan[c + d*x]))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 206

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

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^4(c+dx)}{(a+ia\tan(c+dx))^8}\,dx = -\frac{(ia^5)\,\text{Subst}\left(\int \frac{1}{(a-x)^3(a+x)^{11}}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{(ia^5)\,\text{Subst}\left(\int\left(\frac{1}{2048a^{11}(a-x)^3} + \frac{11}{4096a^{12}(a-x)^2} + \frac{1}{8a^3(a+x)^{11}} + \frac{3}{16a^4(a+x)^{10}} + \frac{3}{16a^5(a+x)^9}\right.\right.}{}$$

$$= \frac{ia^2}{80d(a+ia\tan(c+dx))^{10}} + \frac{ia}{48d(a+ia\tan(c+dx))^9} + \frac{3i}{128d(a+ia\tan(c+dx))}$$

$$= \frac{33x}{2048a^8} + \frac{ia^2}{80d(a+ia\tan(c+dx))^{10}} + \frac{ia}{48d(a+ia\tan(c+dx))^9} + \frac{3i}{128d(a+ia\,\text{ta}}$$

Mathematica [A] time = 1.73, size = 192, normalized size = 0.58

$$\sec^8(c+dx)(-44352\sin(2(c+dx)) - 69300\sin(4(c+dx)) - 79200\sin(6(c+dx)) + 55440idx\sin(8(c+dx))$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (Sec[c + d*x]^8*(97020*I + (177408*I)*Cos[2*(c + d*x)] + (138600*I)*Cos[4*(
c + d*x)] + (105600*I)*Cos[6*(c + d*x)] + (3465*I)*Cos[8*(c + d*x)] + 55440
*d*x*Cos[8*(c + d*x)] - (4480*I)*Cos[10*(c + d*x)] - (168*I)*Cos[12*(c + d*
x)] - 44352*Sin[2*(c + d*x)] - 69300*Sin[4*(c + d*x)] - 79200*Sin[6*(c + d*
x)] + 3465*Sin[8*(c + d*x)] + (55440*I)*d*x*Sin[8*(c + d*x)] + 5600*Sin[10*
(c + d*x)] + 252*Sin[12*(c + d*x)]))/(3440640*a^8*d*(-I + Tan[c + d*x])^8)
```

fricas [A] time = 0.61, size = 153, normalized size = 0.46

$$\left(55440\,dxe^{(20i\,dx+20i\,c)} - 210i\,e^{(24i\,dx+24i\,c)} - 5040i\,e^{(22i\,dx+22i\,c)} + 92400i\,e^{(18i\,dx+18i\,c)} + 103950i\,e^{(16i\,dx+16i\,c)} + 11$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/3440640*(55440*d*x*e^(20*I*d*x + 20*I*c) - 210*I*e^(24*I*d*x + 24*I*c) -
5040*I*e^(22*I*d*x + 22*I*c) + 92400*I*e^(18*I*d*x + 18*I*c) + 103950*I*e^(
16*I*d*x + 16*I*c) + 110880*I*e^(14*I*d*x + 14*I*c) + 97020*I*e^(12*I*d*x +
 12*I*c) + 66528*I*e^(10*I*d*x + 10*I*c) + 34650*I*e^(8*I*d*x + 8*I*c) + 13
200*I*e^(6*I*d*x + 6*I*c) + 3465*I*e^(4*I*d*x + 4*I*c) + 560*I*e^(2*I*d*x +
 2*I*c) + 42*I)*e^(-20*I*d*x - 20*I*c)/(a^8*d)
```

giac [A] time = 5.55, size = 188, normalized size = 0.56

$$-\frac{-\frac{27720i\log(-i\tan(dx+c)+1)}{a^8} + \frac{27720i\log(-i\tan(dx+c)-1)}{a^8} + \frac{420\left(99i\tan(dx+c)^2-220\tan(dx+c)-123i\right)}{a^8(\tan(dx+c)+i)^2} - \frac{81191i\tan(dx+c)^{10}+858110}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] -1/3440640*(-27720*I*log(-I*tan(d*x + c) + 1)/a^8 + 27720*I*log(-I*tan(d*x
+ c) - 1)/a^8 + 420*(99*I*tan(d*x + c)^2 - 220*tan(d*x + c) - 123*I)/(a^8*(
tan(d*x + c) + I)^2) - (81191*I*tan(d*x + c)^10 + 858110*tan(d*x + c)^9 - 4
```

```
107195*I*tan(d*x + c)^8 - 11748840*tan(d*x + c)^7 + 22318590*I*tan(d*x + c)
^6 + 29583540*tan(d*x + c)^5 - 27983550*I*tan(d*x + c)^4 - 19002600*tan(d*x
 + c)^3 + 9206235*I*tan(d*x + c)^2 + 3108990*tan(d*x + c) - 648327*I)/(a^8*
(tan(d*x + c) - I)^10))/d
```

maple [A] time = 0.49, size = 274, normalized size = 0.82

$$\frac{i}{4096a^8d(\tan(dx+c)+i)^2}+\frac{33i\ln(\tan(dx+c)+i)}{4096d\,a^8}+\frac{11}{4096a^8d(\tan(dx+c)+i)}-\frac{33i\ln(\tan(dx+c)-i)}{4096a^8d}+\frac{}{512d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/4096*I/a^8/d/(tan(d*x+c)+I)^2+33/4096*I/a^8/d*ln(tan(d*x+c)+I)+11/4096/a^
8/d/(tan(d*x+c)+I)-33/4096*I/a^8/d*ln(tan(d*x+c)-I)+7/512*I/a^8/d/(tan(d*x+
c)-I)^4+3/128*I/a^8/d/(tan(d*x+c)-I)^8-1/80*I/a^8/d/(tan(d*x+c)-I)^10-5/256
*I/a^8/d/(tan(d*x+c)-I)^6-45/4096*I/a^8/d/(tan(d*x+c)-I)^2+1/48/a^8/d/(tan(
d*x+c)-I)^9-5/224/d/a^8/(tan(d*x+c)-I)^7+21/1280/d/a^8/(tan(d*x+c)-I)^5-3/2
56/a^8/d/(tan(d*x+c)-I)^3+55/4096/a^8/d/(tan(d*x+c)-I)
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 5.70, size = 294, normalized size = 0.88

$$\frac{33\,x}{2048\,a^8}-\frac{\frac{\tan(c+d\,x)\,66953\mathrm{i}}{215040\,a^8}+\frac{17}{105\,a^8}-\frac{9097\tan(c+d\,x)^2}{26880\,a^8}+\frac{\tan(c+d\,x)^3\,4279\mathrm{i}}{43008\,a^8}-\frac{99\tan(c+d\,x)^4}{112\,a^8}-\tan}{d\left(\tan(c+d\,x)^{12}\,1\mathrm{i}+8\tan(c+d\,x)^{11}-\tan(c+d\,x)^{10}\,26\mathrm{i}-40\tan(c+d\,x)^9+\tan(c+d\,x)^8\,15\mathrm{i}-48\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4/(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] (33*x)/(2048*a^8) - ((tan(c + d*x)*66953i)/(215040*a^8) + 17/(105*a^8) - (9
097*tan(c + d*x)^2)/(26880*a^8) + (tan(c + d*x)^3*4279i)/(43008*a^8) - (99*
tan(c + d*x)^4)/(112*a^8) - (tan(c + d*x)^5*42537i)/(35840*a^8) + (341*tan(
c + d*x)^6)/(640*a^8) - (tan(c + d*x)^7*1969i)/(5120*a^8) + (11*tan(c + d*x
)^8)/(16*a^8) + (tan(c + d*x)^9*869i)/(2048*a^8) - (33*tan(c + d*x)^10)/(25
6*a^8) - (tan(c + d*x)^11*33i)/(2048*a^8))/(d*(40*tan(c + d*x)^3 - tan(c +
d*x)^2*26i - 8*tan(c + d*x) + tan(c + d*x)^4*15i + 48*tan(c + d*x)^5 + tan(
c + d*x)^6*84i - 48*tan(c + d*x)^7 + tan(c + d*x)^8*15i - 40*tan(c + d*x)^9
 - tan(c + d*x)^10*26i + 8*tan(c + d*x)^11 + tan(c + d*x)^12*1i + 1i))
```

sympy [A] time = 1.05, size = 464, normalized size = 1.39

$$\begin{cases}\frac{\left(-1143348752854353237236938680970741190492160 0ia^{88}d^{11}e^{114ic}e^{4idx}-2744037006850447769368652834329778857181184 00ia^{88}d^{11}e^{112ic}e^{2idx}+\right.}{} \\ x\left(\frac{\left(e^{24ic}+12e^{22ic}+66e^{20ic}+220e^{18ic}+495e^{16ic}+792e^{14ic}+924e^{12ic}+792e^{10ic}+495e^{8ic}+220e^{6ic}+66e^{4ic}+12e^{2ic}+1\right)e^{-20ic}}{4096a^8}-\frac{33}{2048a^8}\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4/(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Piecewise(((-11433487528543532372369386809707411904921600*I*a**88*d**11*exp
(114*I*c)*exp(4*I*d*x) - 274403700685044776936865283432977885718118400*I*a*
*88*d**11*exp(112*I*c)*exp(2*I*d*x) + 5030734512559154243842530196271261238
165504000*I*a**88*d**11*exp(108*I*c)*exp(-2*I*d*x) + 5659576326629048524322
846470805168892936192000*I*a**88*d**11*exp(106*I*c)*exp(-4*I*d*x) + 6036881
415070985092611036235525513485798604800*I*a**88*d**11*exp(104*I*c)*exp(-6*I
*d*x) + 5282271238187111956034656706084824300073779200*I*a**88*d**11*exp(10
2*I*c)*exp(-8*I*d*x) + 3622128849042591055566621741315308091479162880*I*a**
88*d**11*exp(100*I*c)*exp(-10*I*d*x) + 188652544220968284144094882360172296
4312064000*I*a**88*d**11*exp(98*I*c)*exp(-12*I*d*x) + 718676358937022034834
647170895894462595072000*I*a**88*d**11*exp(96*I*c)*exp(-14*I*d*x) + 1886525
44220968284144094882360172296431206400*I*a**88*d**11*exp(94*I*c)*exp(-16*I*
d*x) + 30489300076116086326318364825886431746457600*I*a**88*d**11*exp(92*I*
c)*exp(-18*I*d*x) + 2286697505708706474473877361941482380984320*I*a**88*d**
11*exp(90*I*c)*exp(-20*I*d*x))*exp(-110*I*c)/(187326259667657234388900033349
0246236650235494400*a**96*d**12), Ne(18732625966765723438890003349024623665
0235494400*a**96*d**12*exp(110*I*c), 0)), (x*((exp(24*I*c) + 12*exp(22*I*c)
 + 66*exp(20*I*c) + 220*exp(18*I*c) + 495*exp(16*I*c) + 792*exp(14*I*c) + 9
24*exp(12*I*c) + 792*exp(10*I*c) + 495*exp(8*I*c) + 220*exp(6*I*c) + 66*exp
(4*I*c) + 12*exp(2*I*c) + 1)*exp(-20*I*c)/(4096*a**8) - 33/(2048*a**8)), Tr
ue)) + 33*x/(2048*a**8)
```

3.176 $\int \frac{\sec^{13}(c+dx)}{(a+ia\tan(c+dx))^8}\,dx$

Optimal. Leaf size=205

$$\frac{1155\tanh^{-1}(\sin(c+dx))}{8a^8d}-\frac{154i\sec^5(c+dx)}{d\left(a^8+ia^8\tan(c+dx)\right)}+\frac{385\tan(c+dx)\sec^3(c+dx)}{4a^8d}+\frac{1155\tan(c+dx)\sec(c+dx)}{8a^8d}-$$

```
[Out] 1155/8*arctanh(sin(d*x+c))/a^8/d+1155/8*sec(d*x+c)*tan(d*x+c)/a^8/d+385/4*s
ec(d*x+c)^3*tan(d*x+c)/a^8/d+2/3*I*sec(d*x+c)^11/a/d/(a+I*a*tan(d*x+c))^7-2
2/3*I*sec(d*x+c)^9/a^3/d/(a+I*a*tan(d*x+c))^5-66*I*sec(d*x+c)^7/a^2/d/(a^2+
I*a^2*tan(d*x+c))^3-154*I*sec(d*x+c)^5/d/(a^8+I*a^8*tan(d*x+c))
```

Rubi [A] time = 0.22, antiderivative size = 205, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3500, 3768, 3770}

$$\frac{1155\tanh^{-1}(\sin(c+dx))}{8a^8d}-\frac{22i\sec^9(c+dx)}{3a^3d(a+ia\tan(c+dx))^5}-\frac{66i\sec^7(c+dx)}{a^2d\left(a^2+ia^2\tan(c+dx)\right)^3}-\frac{154i\sec^5(c+dx)}{d\left(a^8+ia^8\tan(c+dx)\right)}+\frac{385}{}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^13/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (1155*ArcTanh[Sin[c + d*x]])/(8*a^8*d) + (1155*Sec[c + d*x]*Tan[c + d*x])/(
8*a^8*d) + (385*Sec[c + d*x]^3*Tan[c + d*x])/(4*a^8*d) + (((2*I)/3)*Sec[c +
 d*x]^11)/(a*d*(a + I*a*Tan[c + d*x])^7) - (((22*I)/3)*Sec[c + d*x]^9)/(a^3
*d*(a + I*a*Tan[c + d*x])^5) - ((66*I)*Sec[c + d*x]^7)/(a^2*d*(a^2 + I*a^2*
Tan[c + d*x])^3) - ((154*I)*Sec[c + d*x]^5)/(d*(a^8 + I*a^8*Tan[c + d*x]))
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3768

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \frac{\sec^{13}(c+dx)}{(a+ia\tan(c+dx))^8}\,dx = \frac{2i\sec^{11}(c+dx)}{3ad(a+ia\tan(c+dx))^7} - \frac{11\int \frac{\sec^{11}(c+dx)}{(a+ia\tan(c+dx))^6}\,dx}{3a^2}$$

$$= \frac{2i\sec^{11}(c+dx)}{3ad(a+ia\tan(c+dx))^7} - \frac{22i\sec^9(c+dx)}{3a^3d(a+ia\tan(c+dx))^5} + \frac{33\int \frac{\sec^9(c+dx)}{(a+ia\tan(c+dx))^4}\,dx}{a^4}$$

$$= \frac{2i\sec^{11}(c+dx)}{3ad(a+ia\tan(c+dx))^7} - \frac{22i\sec^9(c+dx)}{3a^3d(a+ia\tan(c+dx))^5} - \frac{66i\sec^7(c+dx)}{a^5d(a+ia\tan(c+dx))^3}$$

$$= \frac{2i\sec^{11}(c+dx)}{3ad(a+ia\tan(c+dx))^7} - \frac{22i\sec^9(c+dx)}{3a^3d(a+ia\tan(c+dx))^5} - \frac{66i\sec^7(c+dx)}{a^5d(a+ia\tan(c+dx))^3}$$

$$= \frac{385\sec^3(c+dx)\tan(c+dx)}{4a^8d} + \frac{2i\sec^{11}(c+dx)}{3ad(a+ia\tan(c+dx))^7} - \frac{22i\sec^9(c+dx)}{3a^3d(a+ia\tan(c+d}$$

$$= \frac{1155\sec(c+dx)\tan(c+dx)}{8a^8d} + \frac{385\sec^3(c+dx)\tan(c+dx)}{4a^8d} + \frac{2i\sec^{11}(c+}{3ad(a+ia\tan(c}$$

$$= \frac{1155\tanh^{-1}(\sin(c+dx))}{8a^8d} + \frac{1155\sec(c+dx)\tan(c+dx)}{8a^8d} + \frac{385\sec^3(c+dx)\tan}{4a^8d}$$

Mathematica [B] time = 6.40, size = 1704, normalized size = 8.31

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sec[c + d*x]^13/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (-1155*Cos[8*c]*Log[Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2]]*Sec[c + d*x]^8
*(Cos[d*x] + I*Sin[d*x])^8)/(8*d*(a + I*a*Tan[c + d*x])^8) + (1155*Cos[8*c]
*Log[Cos[c/2 + (d*x)/2] + Sin[c/2 + (d*x)/2]]*Sec[c + d*x]^8*(Cos[d*x] + I*
Sin[d*x])^8)/(8*d*(a + I*a*Tan[c + d*x])^8) + (Cos[3*d*x]*Sec[c + d*x]^8*((
(32*I)/3)*Cos[5*c] - (32*Sin[5*c])/3)*(Cos[d*x] + I*Sin[d*x])^8)/(d*(a + I*
a*Tan[c + d*x])^8) + (Cos[d*x]*Sec[c + d*x]^8*((-160*I)*Cos[7*c] + 160*Sin[
7*c])*(Cos[d*x] + I*Sin[d*x])^8)/(d*(a + I*a*Tan[c + d*x])^8) - (((1155*I)/
8)*Log[Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2]]*Sec[c + d*x]^8*Sin[8*c]*(Co
s[d*x] + I*Sin[d*x])^8)/(d*(a + I*a*Tan[c + d*x])^8) + (((1155*I)/8)*Log[Co
s[c/2 + (d*x)/2] + Sin[c/2 + (d*x)/2]]*Sec[c + d*x]^8*Sin[8*c]*(Cos[d*x] +
I*Sin[d*x])^8)/(d*(a + I*a*Tan[c + d*x])^8) + (Sec[c]*Sec[c + d*x]^8*(((-23
6*I)/3)*Cos[8*c] + (236*Sin[8*c])/3)*(Cos[d*x] + I*Sin[d*x])^8)/(d*(a + I*a
*Tan[c + d*x])^8) + (Sec[c + d*x]^8*(-160*Cos[7*c] - (160*I)*Sin[7*c])*(Cos
[d*x] + I*Sin[d*x])^8*Sin[d*x])/(d*(a + I*a*Tan[c + d*x])^8) + (Sec[c + d*x
]^8*((32*Cos[5*c])/3 + ((32*I)/3)*Sin[5*c])*(Cos[d*x] + I*Sin[d*x])^8*Sin[3
*d*x])/(d*(a + I*a*Tan[c + d*x])^8) + (Sec[c + d*x]^8*(Cos[8*c]/16 + (I/16)
*Sin[8*c])*(Cos[d*x] + I*Sin[d*x])^8)/(d*(Cos[c/2 + (d*x)/2] - Sin[c/2 + (d
*x)/2])^4*(a + I*a*Tan[c + d*x])^8) - ((1/96 + I/96)*Sec[c + d*x]^8*((-407*
I)*Cos[(15*c)/2] + 343*Cos[(17*c)/2] + 407*Sin[(15*c)/2] + (343*I)*Sin[(17*
c)/2])*(Cos[d*x] + I*Sin[d*x])^8)/(d*(Cos[c/2] - Sin[c/2])*(Cos[c/2 + (d*x)
/2] - Sin[c/2 + (d*x)/2])^2*(a + I*a*Tan[c + d*x])^8) + (Sec[c + d*x]^8*(-1
/16*Cos[8*c] - (I/16)*Sin[8*c])*(Cos[d*x] + I*Sin[d*x])^8)/(d*(Cos[c/2 + (d
*x)/2] + Sin[c/2 + (d*x)/2])^4*(a + I*a*Tan[c + d*x])^8) + ((1/96 + I/96)*S
ec[c + d*x]^8*(407*Cos[(15*c)/2] - (343*I)*Cos[(17*c)/2] + (407*I)*Sin[(15*
c)/2] + 343*Sin[(17*c)/2])*(Cos[d*x] + I*Sin[d*x])^8)/(d*(Cos[c/2] + Sin[c/
2])*(Cos[c/2 + (d*x)/2] + Sin[c/2 + (d*x)/2])^2*(a + I*a*Tan[c + d*x])^8) +
 (236*Sec[c + d*x]^8*(Cos[d*x] + I*Sin[d*x])^8*(Cos[8*c - (d*x)/2]/2 - Cos[
8*c + (d*x)/2]/2 + (I/2)*Sin[8*c - (d*x)/2] - (I/2)*Sin[8*c + (d*x)/2]))/(3
```

```
*d*(Cos[c/2] - Sin[c/2])*(Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2])*(a + I*a
*Tan[c + d*x])^8) + (4*Sec[c + d*x]^8*(Cos[d*x] + I*Sin[d*x])^8*(Cos[8*c -
(d*x)/2]/2 - Cos[8*c + (d*x)/2]/2 + (I/2)*Sin[8*c - (d*x)/2] - (I/2)*Sin[8*
c + (d*x)/2]))/(3*d*(Cos[c/2] + Sin[c/2])*(Cos[c/2 + (d*x)/2] + Sin[c/2 + (
d*x)/2])^3*(a + I*a*Tan[c + d*x])^8) + (4*Sec[c + d*x]^8*(Cos[d*x] + I*Sin[
d*x])^8*(-1/2*Cos[8*c - (d*x)/2] + Cos[8*c + (d*x)/2]/2 - (I/2)*Sin[8*c - (
d*x)/2] + (I/2)*Sin[8*c + (d*x)/2]))/(3*d*(Cos[c/2] - Sin[c/2])*(Cos[c/2 +
(d*x)/2] - Sin[c/2 + (d*x)/2])^3*(a + I*a*Tan[c + d*x])^8) + (236*Sec[c + d
*x]^8*(Cos[d*x] + I*Sin[d*x])^8*(-1/2*Cos[8*c - (d*x)/2] + Cos[8*c + (d*x)/
2]/2 - (I/2)*Sin[8*c - (d*x)/2] + (I/2)*Sin[8*c + (d*x)/2]))/(3*d*(Cos[c/2]
 + Sin[c/2])*(Cos[c/2 + (d*x)/2] + Sin[c/2 + (d*x)/2])*(a + I*a*Tan[c + d*x
])^8)
```

fricas [A] time = 0.82, size = 267, normalized size = 1.30

$$\frac{3465\left(e^{(11i\,dx+11i\,c)}+4\,e^{(9i\,dx+9i\,c)}+6\,e^{(7i\,dx+7i\,c)}+4\,e^{(5i\,dx+5i\,c)}+e^{(3i\,dx+3i\,c)}\right)\log\left(e^{(i\,dx+i\,c)}+i\right)-3465\left(e^{(11i\,dx+11i\,c)}+\right.}{24\left(a^{8}de^{(11i\,dx}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^13/(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/24*(3465*(e^(11*I*d*x + 11*I*c) + 4*e^(9*I*d*x + 9*I*c) + 6*e^(7*I*d*x +
7*I*c) + 4*e^(5*I*d*x + 5*I*c) + e^(3*I*d*x + 3*I*c))*log(e^(I*d*x + I*c) +
 I) - 3465*(e^(11*I*d*x + 11*I*c) + 4*e^(9*I*d*x + 9*I*c) + 6*e^(7*I*d*x +
7*I*c) + 4*e^(5*I*d*x + 5*I*c) + e^(3*I*d*x + 3*I*c))*log(e^(I*d*x + I*c) -
 I) - 6930*I*e^(10*I*d*x + 10*I*c) - 25410*I*e^(8*I*d*x + 8*I*c) - 33726*I*
e^(6*I*d*x + 6*I*c) - 18414*I*e^(4*I*d*x + 4*I*c) - 2816*I*e^(2*I*d*x + 2*I
*c) + 256*I)/(a^8*d*e^(11*I*d*x + 11*I*c) + 4*a^8*d*e^(9*I*d*x + 9*I*c) + 6
*a^8*d*e^(7*I*d*x + 7*I*c) + 4*a^8*d*e^(5*I*d*x + 5*I*c) + a^8*d*e^(3*I*d*x
 + 3*I*c))
```

giac [A] time = 6.77, size = 195, normalized size = 0.95

$$\frac{\frac{3465\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^{8}}-\frac{3465\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)}{a^{8}}-\frac{1024\left(6\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{2}-15i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-7\right)}{a^{8}\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)^{3}}-\frac{2\left(369\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{7}-1728i\,\mathrm{ta}\right.}{}}{24\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^13/(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/24*(3465*log(tan(1/2*d*x + 1/2*c) + 1)/a^8 - 3465*log(tan(1/2*d*x + 1/2*c
) - 1)/a^8 - 1024*(6*tan(1/2*d*x + 1/2*c)^2 - 15*I*tan(1/2*d*x + 1/2*c) - 7
)/(a^8*(tan(1/2*d*x + 1/2*c) - I)^3) - 2*(369*tan(1/2*d*x + 1/2*c)^7 - 1728
*I*tan(1/2*d*x + 1/2*c)^6 - 393*tan(1/2*d*x + 1/2*c)^5 + 5568*I*tan(1/2*d*x
 + 1/2*c)^4 - 393*tan(1/2*d*x + 1/2*c)^3 - 5696*I*tan(1/2*d*x + 1/2*c)^2 +
369*tan(1/2*d*x + 1/2*c) + 1856*I)/((tan(1/2*d*x + 1/2*c)^2 - 1)^4*a^8))/d
```

maple [B] time = 0.47, size = 409, normalized size = 2.00

$$\frac{1}{2a^{8}d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^{3}}-\frac{4i}{a^{8}d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)^{2}}-\frac{121}{8a^{8}d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^{2}}-\frac{76i}{a^{8}d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}-\frac{}{8a^{8}d\left(\tan\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^13/(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/2/a^8/d/(tan(1/2*d*x+1/2*c)-1)^3-4*I/a^8/d/(tan(1/2*d*x+1/2*c)+1)^2-121/8
/a^8/d/(tan(1/2*d*x+1/2*c)-1)^2-76*I/a^8/d/(tan(1/2*d*x+1/2*c)+1)-123/8/a^8
/d/(tan(1/2*d*x+1/2*c)-1)-4*I/a^8/d/(tan(1/2*d*x+1/2*c)-1)^2+1/4/a^8/d/(tan
(1/2*d*x+1/2*c)-1)^4-1155/8/a^8/d*ln(tan(1/2*d*x+1/2*c)-1)+121/8/a^8/d/(tan
(1/2*d*x+1/2*c)+1)^2+76*I/a^8/d/(tan(1/2*d*x+1/2*c)-1)+1/2/a^8/d/(tan(1/2*d
*x+1/2*c)+1)^3-8/3*I/a^8/d/(tan(1/2*d*x+1/2*c)-1)^3-123/8/a^8/d/(tan(1/2*d*
x+1/2*c)+1)+8/3*I/a^8/d/(tan(1/2*d*x+1/2*c)+1)^3-1/4/a^8/d/(tan(1/2*d*x+1/2
*c)+1)^4+1155/8/a^8/d*ln(tan(1/2*d*x+1/2*c)+1)+128*I/a^8/d/(tan(1/2*d*x+1/2
*c)-I)^2-256/3/a^8/d/(tan(1/2*d*x+1/2*c)-I)^3-256/a^8/d/(tan(1/2*d*x+1/2*c)
-I)
```

maxima [B] time = 1.24, size = 796, normalized size = 3.88

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^13/(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] -((6930*cos(11*d*x + 11*c) + 27720*cos(9*d*x + 9*c) + 41580*cos(7*d*x + 7*c
) + 27720*cos(5*d*x + 5*c) + 6930*cos(3*d*x + 3*c) + 6930*I*sin(11*d*x + 11
*c) + 27720*I*sin(9*d*x + 9*c) + 41580*I*sin(7*d*x + 7*c) + 27720*I*sin(5*d
*x + 5*c) + 6930*I*sin(3*d*x + 3*c))*arctan2(cos(d*x + c), sin(d*x + c) + 1
) + (6930*cos(11*d*x + 11*c) + 27720*cos(9*d*x + 9*c) + 41580*cos(7*d*x + 7
*c) + 27720*cos(5*d*x + 5*c) + 6930*cos(3*d*x + 3*c) + 6930*I*sin(11*d*x +
11*c) + 27720*I*sin(9*d*x + 9*c) + 41580*I*sin(7*d*x + 7*c) + 27720*I*sin(5
*d*x + 5*c) + 6930*I*sin(3*d*x + 3*c))*arctan2(cos(d*x + c), -sin(d*x + c)
+ 1) - (-3465*I*cos(11*d*x + 11*c) - 13860*I*cos(9*d*x + 9*c) - 20790*I*cos
(7*d*x + 7*c) - 13860*I*cos(5*d*x + 5*c) - 3465*I*cos(3*d*x + 3*c) + 3465*s
in(11*d*x + 11*c) + 13860*sin(9*d*x + 9*c) + 20790*sin(7*d*x + 7*c) + 13860
*sin(5*d*x + 5*c) + 3465*sin(3*d*x + 3*c))*log(cos(d*x + c)^2 + sin(d*x + c
)^2 + 2*sin(d*x + c) + 1) - (3465*I*cos(11*d*x + 11*c) + 13860*I*cos(9*d*x
+ 9*c) + 20790*I*cos(7*d*x + 7*c) + 13860*I*cos(5*d*x + 5*c) + 3465*I*cos(3
*d*x + 3*c) - 3465*sin(11*d*x + 11*c) - 13860*sin(9*d*x + 9*c) - 20790*sin(
7*d*x + 7*c) - 13860*sin(5*d*x + 5*c) - 3465*sin(3*d*x + 3*c))*log(cos(d*x
+ c)^2 + sin(d*x + c)^2 - 2*sin(d*x + c) + 1) + 13860*cos(10*d*x + 10*c) +
50820*cos(8*d*x + 8*c) + 67452*cos(6*d*x + 6*c) + 36828*cos(4*d*x + 4*c) +
5632*cos(2*d*x + 2*c) + 13860*I*sin(10*d*x + 10*c) + 50820*I*sin(8*d*x + 8*
c) + 67452*I*sin(6*d*x + 6*c) + 36828*I*sin(4*d*x + 4*c) + 5632*I*sin(2*d*x
 + 2*c) - 512)/((-48*I*a^8*cos(11*d*x + 11*c) - 192*I*a^8*cos(9*d*x + 9*c)
- 288*I*a^8*cos(7*d*x + 7*c) - 192*I*a^8*cos(5*d*x + 5*c) - 48*I*a^8*cos(3*
d*x + 3*c) + 48*a^8*sin(11*d*x + 11*c) + 192*a^8*sin(9*d*x + 9*c) + 288*a^8
*sin(7*d*x + 7*c) + 192*a^8*sin(5*d*x + 5*c) + 48*a^8*sin(3*d*x + 3*c))*d)
```

mupad [B] time = 7.57, size = 344, normalized size = 1.68

$$\frac{\frac{33847\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{6\,a^8}-\frac{12041\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{3\,a^8}-\frac{3585\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{a^8}+\frac{3505\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9}{4\,a^8}+\frac{4293\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{4\,a^8}+\frac{\tan(}{}}{d\left(-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{11}1\mathrm{i}-3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9 7\mathrm{i}+13\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7 18\mathrm{i}-22\tan\left(\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^13*(a + a*tan(c + d*x)*1i)^8),x)
```

```
[Out] ((tan(c/2 + (d*x)/2)^2*27565i)/(12*a^8) - (12041*tan(c/2 + (d*x)/2)^3)/(3*a
^8) - (tan(c/2 + (d*x)/2)^4*4575i)/a^8 + (33847*tan(c/2 + (d*x)/2)^5)/(6*a^
8) + (tan(c/2 + (d*x)/2)^6*25993i)/(6*a^8) - (3585*tan(c/2 + (d*x)/2)^7)/a^
8 - (tan(c/2 + (d*x)/2)^8*5639i)/(3*a^8) + (3505*tan(c/2 + (d*x)/2)^9)/(4*a
^8) + (tan(c/2 + (d*x)/2)^10*1147i)/(4*a^8) - 1360i/(3*a^8) + (4293*tan(c/2
 + (d*x)/2))/(4*a^8))/(d*(tan(c/2 + (d*x)/2)*3i - 7*tan(c/2 + (d*x)/2)^2 -
```

```
tan(c/2 + (d*x)/2)^3*13i + 18*tan(c/2 + (d*x)/2)^4 + tan(c/2 + (d*x)/2)^5*2
2i - 22*tan(c/2 + (d*x)/2)^6 - tan(c/2 + (d*x)/2)^7*18i + 13*tan(c/2 + (d*x
)/2)^8 + tan(c/2 + (d*x)/2)^9*7i - 3*tan(c/2 + (d*x)/2)^10 - tan(c/2 + (d*x
)/2)^11*1i + 1)) + (1155*atanh(tan(c/2 + (d*x)/2)))/(4*a^8*d)
```

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

$$\frac{\int \frac{\sec^{13}(c+dx)}{\tan^8(c+dx)-8i\tan^7(c+dx)-28\tan^6(c+dx)+56i\tan^5(c+dx)+70\tan^4(c+dx)-56i\tan^3(c+dx)-28\tan^2(c+dx)+8i\tan(c+dx)+1}\,dx}{a^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**13/(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Integral(sec(c + d*x)**13/(tan(c + d*x)**8 - 8*I*tan(c + d*x)**7 - 28*tan(c
 + d*x)**6 + 56*I*tan(c + d*x)**5 + 70*tan(c + d*x)**4 - 56*I*tan(c + d*x)*
*3 - 28*tan(c + d*x)**2 + 8*I*tan(c + d*x) + 1), x)/a**8
```

3.177 $\int \frac{\sec^{11}(c+dx)}{(a+ia\tan(c+dx))^8}\,dx$

Optimal. Leaf size=183

$$-\frac{63\tanh^{-1}(\sin(c+dx))}{2a^8d}+\frac{42i\sec^3(c+dx)}{d\left(a^8+ia^8\tan(c+dx)\right)}-\frac{63\tan(c+dx)\sec(c+dx)}{2a^8d}-\frac{6i\sec^7(c+dx)}{5a^3d(a+ia\tan(c+dx))^5}+\frac{}{5a}$$

```
[Out] -63/2*arctanh(sin(d*x+c))/a^8/d-63/2*sec(d*x+c)*tan(d*x+c)/a^8/d+2/5*I*sec(
d*x+c)^9/a/d/(a+I*a*tan(d*x+c))^7-6/5*I*sec(d*x+c)^7/a^3/d/(a+I*a*tan(d*x+c
))^5+42/5*I*sec(d*x+c)^5/a^2/d/(a^2+I*a^2*tan(d*x+c))^3+42*I*sec(d*x+c)^3/d
/(a^8+I*a^8*tan(d*x+c))
```

Rubi [A] time = 0.20, antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3500, 3768, 3770}

$$-\frac{63\tanh^{-1}(\sin(c+dx))}{2a^8d}-\frac{6i\sec^7(c+dx)}{5a^3d(a+ia\tan(c+dx))^5}+\frac{42i\sec^5(c+dx)}{5a^2d\left(a^2+ia^2\tan(c+dx)\right)^3}+\frac{42i\sec^3(c+dx)}{d\left(a^8+ia^8\tan(c+dx)\right)}-$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^11/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (-63*ArcTanh[Sin[c + d*x]])/(2*a^8*d) - (63*Sec[c + d*x]*Tan[c + d*x])/(2*a
^8*d) + (((2*I)/5)*Sec[c + d*x]^9)/(a*d*(a + I*a*Tan[c + d*x])^7) - (((6*I)
/5)*Sec[c + d*x]^7)/(a^3*d*(a + I*a*Tan[c + d*x])^5) + (((42*I)/5)*Sec[c +
d*x]^5)/(a^2*d*(a^2 + I*a^2*Tan[c + d*x])^3) + ((42*I)*Sec[c + d*x]^3)/(d*(
a^8 + I*a^8*Tan[c + d*x]))
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3768

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

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \frac{\sec^{11}(c+dx)}{(a+ia\tan(c+dx))^8}\,dx = \frac{2i\sec^9(c+dx)}{5ad(a+ia\tan(c+dx))^7} - \frac{9\int \frac{\sec^9(c+dx)}{(a+ia\tan(c+dx))^6}dx}{5a^2}$$

$$= \frac{2i\sec^9(c+dx)}{5ad(a+ia\tan(c+dx))^7} - \frac{6i\sec^7(c+dx)}{5a^3d(a+ia\tan(c+dx))^5} + \frac{21\int \frac{\sec^7(c+dx)}{(a+ia\tan(c+dx))^4}dx}{5a^4}$$

$$= \frac{2i\sec^9(c+dx)}{5ad(a+ia\tan(c+dx))^7} - \frac{6i\sec^7(c+dx)}{5a^3d(a+ia\tan(c+dx))^5} + \frac{42i\sec^5(c+dx)}{5a^5d(a+ia\tan(c+dx))^3} -$$

$$= \frac{2i\sec^9(c+dx)}{5ad(a+ia\tan(c+dx))^7} - \frac{6i\sec^7(c+dx)}{5a^3d(a+ia\tan(c+dx))^5} + \frac{42i\sec^5(c+dx)}{5a^5d(a+ia\tan(c+dx))^3} +$$

$$= -\frac{63\sec(c+dx)\tan(c+dx)}{2a^8d} + \frac{2i\sec^9(c+dx)}{5ad(a+ia\tan(c+dx))^7} - \frac{6i\sec^7(c+dx)}{5a^3d(a+ia\tan(c+dx))^5}$$

$$= -\frac{63\tanh^{-1}(\sin(c+dx))}{2a^8d} - \frac{63\sec(c+dx)\tan(c+dx)}{2a^8d} + \frac{2i\sec^9(c+dx)}{5ad(a+ia\tan(c+dx))^7} -$$

Mathematica [B] time = 6.28, size = 1244, normalized size = 6.80

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^11/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (63*Cos[8*c]*Log[Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2]]*Sec[c + d*x]^8*(C
os[d*x] + I*Sin[d*x])^8)/(2*d*(a + I*a*Tan[c + d*x])^8) - (63*Cos[8*c]*Log[
Cos[c/2 + (d*x)/2] + Sin[c/2 + (d*x)/2]]*Sec[c + d*x]^8*(Cos[d*x] + I*Sin[d
*x])^8)/(2*d*(a + I*a*Tan[c + d*x])^8) + (Cos[5*d*x]*Sec[c + d*x]^8*(((8*I)
/5)*Cos[3*c] - (8*Sin[3*c])/5)*(Cos[d*x] + I*Sin[d*x])^8)/(d*(a + I*a*Tan[c
 + d*x])^8) + (Cos[3*d*x]*Sec[c + d*x]^8*((-8*I)*Cos[5*c] + 8*Sin[5*c])*(Co
s[d*x] + I*Sin[d*x])^8)/(d*(a + I*a*Tan[c + d*x])^8) + (Cos[d*x]*Sec[c + d*
x]^8*((48*I)*Cos[7*c] - 48*Sin[7*c])*(Cos[d*x] + I*Sin[d*x])^8)/(d*(a + I*a
*Tan[c + d*x])^8) + (Sec[c]*Sec[c + d*x]^8*((8*I)*Cos[8*c] - 8*Sin[8*c])*(C
os[d*x] + I*Sin[d*x])^8)/(d*(a + I*a*Tan[c + d*x])^8) + (((63*I)/2)*Log[Cos
[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2]]*Sec[c + d*x]^8*Sin[8*c]*(Cos[d*x] + I
*Sin[d*x])^8)/(d*(a + I*a*Tan[c + d*x])^8) - (((63*I)/2)*Log[Cos[c/2 + (d*x
)/2] + Sin[c/2 + (d*x)/2]]*Sec[c + d*x]^8*Sin[8*c]*(Cos[d*x] + I*Sin[d*x])^
8)/(d*(a + I*a*Tan[c + d*x])^8) + (Sec[c + d*x]^8*(48*Cos[7*c] + (48*I)*Sin
[7*c])*(Cos[d*x] + I*Sin[d*x])^8*Sin[d*x])/(d*(a + I*a*Tan[c + d*x])^8) + (
Sec[c + d*x]^8*(-8*Cos[5*c] - (8*I)*Sin[5*c])*(Cos[d*x] + I*Sin[d*x])^8*Sin
[3*d*x])/(d*(a + I*a*Tan[c + d*x])^8) + (Sec[c + d*x]^8*((8*Cos[3*c])/5 + (
(8*I)/5)*Sin[3*c])*(Cos[d*x] + I*Sin[d*x])^8*Sin[5*d*x])/(d*(a + I*a*Tan[c
+ d*x])^8) + (Sec[c + d*x]^8*(Cos[8*c]/4 + (I/4)*Sin[8*c])*(Cos[d*x] + I*Si
n[d*x])^8)/(d*(Cos[c/2 + (d*x)/2] - Sin[c/2 + (d*x)/2])^2*(a + I*a*Tan[c +
d*x])^8) + (Sec[c + d*x]^8*(-1/4*Cos[8*c] - (I/4)*Sin[8*c])*(Cos[d*x] + I*S
in[d*x])^8)/(d*(Cos[c/2 + (d*x)/2] + Sin[c/2 + (d*x)/2])^2*(a + I*a*Tan[c +
 d*x])^8) + (8*Sec[c + d*x]^8*(Cos[d*x] + I*Sin[d*x])^8*(Cos[8*c - (d*x)/2]
/2 - Cos[8*c + (d*x)/2]/2 + (I/2)*Sin[8*c - (d*x)/2] - (I/2)*Sin[8*c + (d*x
)/2]))/(d*(Cos[c/2] + Sin[c/2])*(Cos[c/2 + (d*x)/2] + Sin[c/2 + (d*x)/2])*(
a + I*a*Tan[c + d*x])^8) + (8*Sec[c + d*x]^8*(Cos[d*x] + I*Sin[d*x])^8*(-1/
2*Cos[8*c - (d*x)/2] + Cos[8*c + (d*x)/2]/2 - (I/2)*Sin[8*c - (d*x)/2] + (I
/2)*Sin[8*c + (d*x)/2]))/(d*(Cos[c/2] - Sin[c/2])*(Cos[c/2 + (d*x)/2] - Sin
[c/2 + (d*x)/2])*(a + I*a*Tan[c + d*x])^8)
```

fricas [A] time = 0.75, size = 182, normalized size = 0.99

$$-\frac{315\left(e^{(9i\,dx+9i\,c)}+2\,e^{(7i\,dx+7i\,c)}+e^{(5i\,dx+5i\,c)}\right)\log\left(e^{(i\,dx+i\,c)}+i\right)-315\left(e^{(9i\,dx+9i\,c)}+2\,e^{(7i\,dx+7i\,c)}+e^{(5i\,dx+5i\,c)}\right)\log}{10\left(a^8de^{(9i\,dx+9i\,c)}+2\,a^8de^{(7i\,dx+7i\,c)}+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^11/(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] -1/10*(315*(e^(9*I*d*x + 9*I*c) + 2*e^(7*I*d*x + 7*I*c) + e^(5*I*d*x + 5*I*
c))*log(e^(I*d*x + I*c) + I) - 315*(e^(9*I*d*x + 9*I*c) + 2*e^(7*I*d*x + 7*
I*c) + e^(5*I*d*x + 5*I*c))*log(e^(I*d*x + I*c) - I) - 630*I*e^(8*I*d*x + 8
*I*c) - 1050*I*e^(6*I*d*x + 6*I*c) - 336*I*e^(4*I*d*x + 4*I*c) + 48*I*e^(2*
I*d*x + 2*I*c) - 16*I)/(a^8*d*e^(9*I*d*x + 9*I*c) + 2*a^8*d*e^(7*I*d*x + 7*
I*c) + a^8*d*e^(5*I*d*x + 5*I*c))
```

giac [A] time = 5.57, size = 165, normalized size = 0.90

$$-\frac{\frac{315\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^8}-\frac{315\,\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)}{a^8}-\frac{10\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3-16i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+16i\right)}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)^2a^8}-\frac{4\left(160\,\tan\left(\frac{1}{2}\right.\right.}{}}{10\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^11/(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] -1/10*(315*log(tan(1/2*d*x + 1/2*c) + 1)/a^8 - 315*log(tan(1/2*d*x + 1/2*c)
 - 1)/a^8 - 10*(tan(1/2*d*x + 1/2*c)^3 - 16*I*tan(1/2*d*x + 1/2*c)^2 + tan(
1/2*d*x + 1/2*c) + 16*I)/((tan(1/2*d*x + 1/2*c)^2 - 1)^2*a^8) - 4*(160*tan(
1/2*d*x + 1/2*c)^4 - 720*I*tan(1/2*d*x + 1/2*c)^3 - 1360*tan(1/2*d*x + 1/2*
c)^2 + 880*I*tan(1/2*d*x + 1/2*c) + 208)/(a^8*(tan(1/2*d*x + 1/2*c) - I)^5)
)/d
```

maple [A] time = 0.46, size = 282, normalized size = 1.54

$$\frac{1}{2a^8d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}-\frac{8i}{a^8d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\frac{1}{2a^8d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)^2}+\frac{63\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{2a^8d}+\frac{}{2a^8d\,(\mathrm{t}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^11/(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 1/2/a^8/d/(tan(1/2*d*x+1/2*c)-1)-8*I/a^8/d/(tan(1/2*d*x+1/2*c)-1)+1/2/a^8/d
/(tan(1/2*d*x+1/2*c)-1)^2+63/2/a^8/d*ln(tan(1/2*d*x+1/2*c)-1)+1/2/a^8/d/(ta
n(1/2*d*x+1/2*c)+1)+8*I/a^8/d/(tan(1/2*d*x+1/2*c)+1)-1/2/a^8/d/(tan(1/2*d*x
+1/2*c)+1)^2-63/2/a^8/d*ln(tan(1/2*d*x+1/2*c)+1)-32*I/a^8/d/(tan(1/2*d*x+1/
2*c)-I)^2-128*I/a^8/d/(tan(1/2*d*x+1/2*c)-I)^4+256/5/a^8/d/(tan(1/2*d*x+1/2
*c)-I)^5-64/a^8/d/(tan(1/2*d*x+1/2*c)-I)^3+64/a^8/d/(tan(1/2*d*x+1/2*c)-I)
```

maxima [B] time = 0.63, size = 541, normalized size = 2.96

$$\frac{(630\,\cos\left(9\,dx+9\,c\right)+1260\,\cos\left(7\,dx+7\,c\right)+630\,\cos\left(5\,dx+5\,c\right)+630i\,\sin\left(9\,dx+9\,c\right)+1260i\,\sin(7\,dx+}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^11/(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] ((630*cos(9*d*x + 9*c) + 1260*cos(7*d*x + 7*c) + 630*cos(5*d*x + 5*c) + 630
*I*sin(9*d*x + 9*c) + 1260*I*sin(7*d*x + 7*c) + 630*I*sin(5*d*x + 5*c))*arc
tan2(cos(d*x + c), sin(d*x + c) + 1) + (630*cos(9*d*x + 9*c) + 1260*cos(7*d
*x + 7*c) + 630*cos(5*d*x + 5*c) + 630*I*sin(9*d*x + 9*c) + 1260*I*sin(7*d*
x + 7*c) + 630*I*sin(5*d*x + 5*c))*arctan2(cos(d*x + c), -sin(d*x + c) + 1)
 - (-315*I*cos(9*d*x + 9*c) - 630*I*cos(7*d*x + 7*c) - 315*I*cos(5*d*x + 5*
c) + 315*sin(9*d*x + 9*c) + 630*sin(7*d*x + 7*c) + 315*sin(5*d*x + 5*c))*lo
g(cos(d*x + c)^2 + sin(d*x + c)^2 + 2*sin(d*x + c) + 1) - (315*I*cos(9*d*x
+ 9*c) + 630*I*cos(7*d*x + 7*c) + 315*I*cos(5*d*x + 5*c) - 315*sin(9*d*x +
9*c) - 630*sin(7*d*x + 7*c) - 315*sin(5*d*x + 5*c))*log(cos(d*x + c)^2 + si
n(d*x + c)^2 - 2*sin(d*x + c) + 1) + 1260*cos(8*d*x + 8*c) + 2100*cos(6*d*x
 + 6*c) + 672*cos(4*d*x + 4*c) - 96*cos(2*d*x + 2*c) + 1260*I*sin(8*d*x + 8
*c) + 2100*I*sin(6*d*x + 6*c) + 672*I*sin(4*d*x + 4*c) - 96*I*sin(2*d*x + 2
*c) + 32)/((-20*I*a^8*cos(9*d*x + 9*c) - 40*I*a^8*cos(7*d*x + 7*c) - 20*I*a
^8*cos(5*d*x + 5*c) + 20*a^8*sin(9*d*x + 9*c) + 40*a^8*sin(7*d*x + 7*c) + 2
0*a^8*sin(5*d*x + 5*c))*d)
```

mupad [B] time = 7.44, size = 284, normalized size = 1.55

$$-\frac{63\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{a^8\,d}+\frac{\frac{1223\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{a^8}-\frac{1109\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{a^8}+\frac{309\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{a^8}-\frac{431\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{a^8}}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9 1\mathrm{i}+5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7 12\mathrm{i}-20\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6+\tan\left(\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^11*(a + a*tan(c + d*x)*1i)^8),x)
```

```
[Out] ((1223*tan(c/2 + (d*x)/2)^3)/a^8 - (tan(c/2 + (d*x)/2)^2*4407i)/(5*a^8) + (
tan(c/2 + (d*x)/2)^4*7351i)/(5*a^8) - (1109*tan(c/2 + (d*x)/2)^5)/a^8 - (ta
n(c/2 + (d*x)/2)^6*761i)/a^8 + (309*tan(c/2 + (d*x)/2)^7)/a^8 + (tan(c/2 +
(d*x)/2)^8*65i)/a^8 + 496i/(5*a^8) - (431*tan(c/2 + (d*x)/2))/a^8)/(d*(tan(
c/2 + (d*x)/2)*5i - 12*tan(c/2 + (d*x)/2)^2 - tan(c/2 + (d*x)/2)^3*20i + 26
*tan(c/2 + (d*x)/2)^4 + tan(c/2 + (d*x)/2)^5*26i - 20*tan(c/2 + (d*x)/2)^6
- tan(c/2 + (d*x)/2)^7*12i + 5*tan(c/2 + (d*x)/2)^8 + tan(c/2 + (d*x)/2)^9*
1i + 1)) - (63*atanh(tan(c/2 + (d*x)/2)))/(a^8*d)
```

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

$$\frac{\int \frac{\sec^{11}(c+dx)}{\tan^8(c+dx)-8i\tan^7(c+dx)-28\tan^6(c+dx)+56i\tan^5(c+dx)+70\tan^4(c+dx)-56i\tan^3(c+dx)-28\tan^2(c+dx)+8i\tan(c+dx)+1}\,dx}{a^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**11/(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Integral(sec(c + d*x)**11/(tan(c + d*x)**8 - 8*I*tan(c + d*x)**7 - 28*tan(c
 + d*x)**6 + 56*I*tan(c + d*x)**5 + 70*tan(c + d*x)**4 - 56*I*tan(c + d*x)*
*3 - 28*tan(c + d*x)**2 + 8*I*tan(c + d*x) + 1), x)/a**8
```

3.178 $\int \frac{\sec^9(c+dx)}{(a+ia\tan(c+dx))^8}\,dx$

Optimal. Leaf size=156

$$\frac{\tanh^{-1}(\sin(c+dx))}{a^8d}-\frac{2i\sec(c+dx)}{d\left(a^8+ia^8\tan(c+dx)\right)}-\frac{2i\sec^5(c+dx)}{5a^3d(a+ia\tan(c+dx))^5}+\frac{2i\sec^3(c+dx)}{3a^2d\left(a^2+ia^2\tan(c+dx)\right)^3}+\frac{2}{7ad(}$$

```
[Out] arctanh(sin(d*x+c))/a^8/d+2/7*I*sec(d*x+c)^7/a/d/(a+I*a*tan(d*x+c))^7-2/5*I
*sec(d*x+c)^5/a^3/d/(a+I*a*tan(d*x+c))^5+2/3*I*sec(d*x+c)^3/a^2/d/(a^2+I*a^
2*tan(d*x+c))^3-2*I*sec(d*x+c)/d/(a^8+I*a^8*tan(d*x+c))
```

Rubi [A] time = 0.22, antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3500, 3770}

$$\frac{\tanh^{-1}(\sin(c+dx))}{a^8d}-\frac{2i\sec^5(c+dx)}{5a^3d(a+ia\tan(c+dx))^5}+\frac{2i\sec^3(c+dx)}{3a^2d\left(a^2+ia^2\tan(c+dx)\right)^3}-\frac{2i\sec(c+dx)}{d\left(a^8+ia^8\tan(c+dx)\right)}+\frac{2}{7ad(}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^9/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ArcTanh[Sin[c + d*x]]/(a^8*d) + (((2*I)/7)*Sec[c + d*x]^7)/(a*d*(a + I*a*Ta
n[c + d*x])^7) - (((2*I)/5)*Sec[c + d*x]^5)/(a^3*d*(a + I*a*Tan[c + d*x])^5
) + (((2*I)/3)*Sec[c + d*x]^3)/(a^2*d*(a^2 + I*a^2*Tan[c + d*x])^3) - ((2*I
)*Sec[c + d*x])/(d*(a^8 + I*a^8*Tan[c + d*x]))
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \frac{\sec^9(c+dx)}{(a+ia\tan(c+dx))^8}\,dx = \frac{2i\sec^7(c+dx)}{7ad(a+ia\tan(c+dx))^7} - \frac{\int \frac{\sec^7(c+dx)}{(a+ia\tan(c+dx))^6}\,dx}{a^2}$$

$$= \frac{2i\sec^7(c+dx)}{7ad(a+ia\tan(c+dx))^7} - \frac{2i\sec^5(c+dx)}{5a^3d(a+ia\tan(c+dx))^5} + \frac{\int \frac{\sec^5(c+dx)}{(a+ia\tan(c+dx))^4}\,dx}{a^4}$$

$$= \frac{2i\sec^7(c+dx)}{7ad(a+ia\tan(c+dx))^7} - \frac{2i\sec^5(c+dx)}{5a^3d(a+ia\tan(c+dx))^5} + \frac{2i\sec^3(c+dx)}{3a^5d(a+ia\tan(c+dx))^3} -$$

$$= \frac{2i\sec^7(c+dx)}{7ad(a+ia\tan(c+dx))^7} - \frac{2i\sec^5(c+dx)}{5a^3d(a+ia\tan(c+dx))^5} + \frac{2i\sec^3(c+dx)}{3a^5d(a+ia\tan(c+dx))^3} -$$

$$= \frac{\tanh^{-1}(\sin(c+dx))}{a^8d} + \frac{2i\sec^7(c+dx)}{7ad(a+ia\tan(c+dx))^7} - \frac{2i\sec^5(c+dx)}{5a^3d(a+ia\tan(c+dx))^5} + \frac{}{3a^5d}$$

Mathematica [A] time = 1.08, size = 304, normalized size = 1.95

$$\frac{\sec^8(c+dx)\left(\cos\left(\frac{9}{2}(c+dx)\right)+i\sin\left(\frac{9}{2}(c+dx)\right)\right)\left(-70\sin\left(\frac{1}{2}(c+dx)\right)-42\sin\left(\frac{3}{2}(c+dx)\right)+210\sin\left(\frac{5}{2}(c+dx)\right)\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^9/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (Sec[c + d*x]^8*((70*I)*Cos[(c + d*x)/2] - (42*I)*Cos[(3*(c + d*x))/2] - (2
10*I)*Cos[(5*(c + d*x))/2] + (30*I)*Cos[(7*(c + d*x))/2] - 105*Cos[(7*(c +
d*x))/2]*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + 105*Cos[(7*(c + d*x))/2
]*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] - 70*Sin[(c + d*x)/2] - 42*Sin[(
3*(c + d*x))/2] + 210*Sin[(5*(c + d*x))/2] + 30*Sin[(7*(c + d*x))/2] - (105
*I)*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]]*Sin[(7*(c + d*x))/2] + (105*I)
*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]*Sin[(7*(c + d*x))/2])*(Cos[(9*(c
+ d*x))/2] + I*Sin[(9*(c + d*x))/2]))/(105*a^8*d*(-I + Tan[c + d*x])^8)
```

fricas [A] time = 0.53, size = 98, normalized size = 0.63

$$\frac{\left(105\,e^{(7i\,dx+7i\,c)}\log\left(e^{(i\,dx+i\,c)}+i\right)-105\,e^{(7i\,dx+7i\,c)}\log\left(e^{(i\,dx+i\,c)}-i\right)-210i\,e^{(6i\,dx+6i\,c)}+70i\,e^{(4i\,dx+4i\,c)}-42i\,e^{(2i\,dx+2i\,c)}\right.}{105\,a^8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/105*(105*e^(7*I*d*x + 7*I*c)*log(e^(I*d*x + I*c) + I) - 105*e^(7*I*d*x +
7*I*c)*log(e^(I*d*x + I*c) - I) - 210*I*e^(6*I*d*x + 6*I*c) + 70*I*e^(4*I*d
*x + 4*I*c) - 42*I*e^(2*I*d*x + 2*I*c) + 30*I)*e^(-7*I*d*x - 7*I*c)/(a^8*d)
```

giac [A] time = 4.74, size = 123, normalized size = 0.79

$$\frac{\frac{105\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right)}{a^8}-\frac{105\log\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right)}{a^8}-\frac{2\left(-840i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5-1400\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^4+3920i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+2352\,\tan\left(\frac{1}{2}\,d\right.\right.}{a^8\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-i\right)^7}}{105\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/105*(105*log(tan(1/2*d*x + 1/2*c) + 1)/a^8 - 105*log(tan(1/2*d*x + 1/2*c)
 - 1)/a^8 - 2*(-840*I*tan(1/2*d*x + 1/2*c)^5 - 1400*tan(1/2*d*x + 1/2*c)^4
+ 3920*I*tan(1/2*d*x + 1/2*c)^3 + 2352*tan(1/2*d*x + 1/2*c)^2 - 1064*I*tan(
1/2*d*x + 1/2*c) - 152)/(a^8*(tan(1/2*d*x + 1/2*c) - I)^7))/d
```

maple [A] time = 0.52, size = 176, normalized size = 1.13

$$-\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{a^8 d}+\frac{\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+1\right)}{a^8 d}+\frac{128i}{a^8 d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^6}+\frac{16i}{a^8 d\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^2}-\frac{12}{a^8 d\left(\tan\left(\frac{d}{2}\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] -1/a^8/d*ln(tan(1/2*d*x+1/2*c)-1)+1/a^8/d*ln(tan(1/2*d*x+1/2*c)+1)+128*I/a^
8/d/(tan(1/2*d*x+1/2*c)-I)^6+16*I/a^8/d/(tan(1/2*d*x+1/2*c)-I)^2-128*I/a^8/
d/(tan(1/2*d*x+1/2*c)-I)^4-256/7/a^8/d/(tan(1/2*d*x+1/2*c)-I)^7+896/5/a^8/d
/(tan(1/2*d*x+1/2*c)-I)^5-160/3/a^8/d/(tan(1/2*d*x+1/2*c)-I)^3
```

maxima [A] time = 0.75, size = 185, normalized size = 1.19

$$\frac{-210i\arctan\left(\cos\left(dx+c\right),\sin\left(dx+c\right)+1\right)-210i\arctan\left(\cos\left(dx+c\right),-\sin\left(dx+c\right)+1\right)+60i\cos\left(7dx+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] 1/210*(-210*I*arctan2(cos(d*x + c), sin(d*x + c) + 1) - 210*I*arctan2(cos(d
*x + c), -sin(d*x + c) + 1) + 60*I*cos(7*d*x + 7*c) - 84*I*cos(5*d*x + 5*c)
 + 140*I*cos(3*d*x + 3*c) - 420*I*cos(d*x + c) + 105*log(cos(d*x + c)^2 + s
in(d*x + c)^2 + 2*sin(d*x + c) + 1) - 105*log(cos(d*x + c)^2 + sin(d*x + c)
^2 - 2*sin(d*x + c) + 1) + 60*sin(7*d*x + 7*c) - 84*sin(5*d*x + 5*c) + 140*
sin(3*d*x + 3*c) - 420*sin(d*x + c))/(a^8*d)
```

mupad [B] time = 6.94, size = 207, normalized size = 1.33

$$\frac{2\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{a^8\,d}+\frac{\frac{16\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5}{a^8}-\frac{224\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{3\,a^8}+\frac{304\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{15\,a^8}+\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{5\,a^8}}{d\left(-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7 1\mathrm{i}-7\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5 21\mathrm{i}+35\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-\mathrm{tan}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^9*(a + a*tan(c + d*x)*1i)^8),x)
```

```
[Out] (2*atanh(tan(c/2 + (d*x)/2)))/(a^8*d) + ((tan(c/2 + (d*x)/2)^2*224i)/(5*a^8
) - (224*tan(c/2 + (d*x)/2)^3)/(3*a^8) - (tan(c/2 + (d*x)/2)^4*80i)/(3*a^8)
 + (16*tan(c/2 + (d*x)/2)^5)/a^8 - 304i/(105*a^8) + (304*tan(c/2 + (d*x)/2)
)/(15*a^8))/(d*(tan(c/2 + (d*x)/2)*7i - 21*tan(c/2 + (d*x)/2)^2 - tan(c/2 +
 (d*x)/2)^3*35i + 35*tan(c/2 + (d*x)/2)^4 + tan(c/2 + (d*x)/2)^5*21i - 7*ta
n(c/2 + (d*x)/2)^6 - tan(c/2 + (d*x)/2)^7*1i + 1))
```

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

$$\frac{\int \frac{\sec^9(c+dx)}{\tan^8(c+dx)-8i\tan^7(c+dx)-28\tan^6(c+dx)+56i\tan^5(c+dx)+70\tan^4(c+dx)-56i\tan^3(c+dx)-28\tan^2(c+dx)+8i\tan(c+dx)+1}\,dx}{a^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**9/(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Integral(sec(c + d*x)**9/(tan(c + d*x)**8 - 8*I*tan(c + d*x)**7 - 28*tan(c
+ d*x)**6 + 56*I*tan(c + d*x)**5 + 70*tan(c + d*x)**4 - 56*I*tan(c + d*x)**
3 - 28*tan(c + d*x)**2 + 8*I*tan(c + d*x) + 1), x)/a**8
```

3.179 $\int \frac{\sec^7(c+dx)}{(a+ia\tan(c+dx))^8}\,dx$

Optimal. Leaf size=68

$$\frac{i\sec^7(c+dx)}{63ad(a+ia\tan(c+dx))^7}+\frac{i\sec^7(c+dx)}{9d(a+ia\tan(c+dx))^8}$$

```
[Out] 1/9*I*sec(d*x+c)^7/d/(a+I*a*tan(d*x+c))^8+1/63*I*sec(d*x+c)^7/a/d/(a+I*a*ta
n(d*x+c))^7
```

Rubi [A] time = 0.08, antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3502, 3488}

$$\frac{i\sec^7(c+dx)}{63ad(a+ia\tan(c+dx))^7}+\frac{i\sec^7(c+dx)}{9d(a+ia\tan(c+dx))^8}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^7/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((I/9)*Sec[c + d*x]^7)/(d*(a + I*a*Tan[c + d*x])^8) + ((I/63)*Sec[c + d*x]^
7)/(a*d*(a + I*a*Tan[c + d*x])^7)
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3502

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

Rubi steps

$$\begin{aligned}\int \frac{\sec^7(c+dx)}{(a+ia\tan(c+dx))^8}\,dx &= \frac{i\sec^7(c+dx)}{9d(a+ia\tan(c+dx))^8}+\frac{\int \frac{\sec^7(c+dx)}{(a+ia\tan(c+dx))^7}\,dx}{9a}\\ &= \frac{i\sec^7(c+dx)}{9d(a+ia\tan(c+dx))^8}+\frac{i\sec^7(c+dx)}{63ad(a+ia\tan(c+dx))^7}\end{aligned}$$

Mathematica [A] time = 0.12, size = 40, normalized size = 0.59

$$-\frac{(\tan(c+dx)-8i)\sec^7(c+dx)}{63a^8d(\tan(c+dx)-i)^8}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^7/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] -1/63*(Sec[c + d*x]^7*(-8*I + Tan[c + d*x]))/(a^8*d*(-I + Tan[c + d*x])^8)
```

fricas [A] time = 0.47, size = 30, normalized size = 0.44

$$\frac{\left(9 i e^{(2 i dx + 2 i c)} + 7 i\right) e^{(-9 i dx - 9 i c)}}{126 a^8 d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/126*(9*I*e^(2*I*d*x + 2*I*c) + 7*I)*e^(-9*I*d*x - 9*I*c)/(a^8*d)
```

giac [B] time = 6.55, size = 125, normalized size = 1.84

$$\frac{2\left(63 \tan\left(\frac{1}{2} dx + \frac{1}{2} c\right)^8 - 63 i \tan\left(\frac{1}{2} dx + \frac{1}{2} c\right)^7 - 483 \tan\left(\frac{1}{2} dx + \frac{1}{2} c\right)^6 + 315 i \tan\left(\frac{1}{2} dx + \frac{1}{2} c\right)^5 + 693 \tan\left(\frac{1}{2} dx\right.\right.}{63 a^8 d\left(\tan\left(\frac{1}{2} dx + \frac{1}{2} c\right) - i\right)^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 2/63*(63*tan(1/2*d*x + 1/2*c)^8 - 63*I*tan(1/2*d*x + 1/2*c)^7 - 483*tan(1/2
*d*x + 1/2*c)^6 + 315*I*tan(1/2*d*x + 1/2*c)^5 + 693*tan(1/2*d*x + 1/2*c)^4
 - 189*I*tan(1/2*d*x + 1/2*c)^3 - 225*tan(1/2*d*x + 1/2*c)^2 + 9*I*tan(1/2*
d*x + 1/2*c) + 8)/(a^8*d*(tan(1/2*d*x + 1/2*c) - I)^9)
```

maple [B] time = 0.52, size = 156, normalized size = 2.29

$$\frac{-\frac{172}{3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^3} + \frac{256}{9\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^9} - \frac{128 i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^8} + \frac{272}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^5} - \frac{152 i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^4} + \frac{14 i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^2} + \frac{992 i}{3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^6}}{a^8 d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 2/d/a^8*(-86/3/(tan(1/2*d*x+1/2*c)-I)^3+128/9/(tan(1/2*d*x+1/2*c)-I)^9-64*I
/(tan(1/2*d*x+1/2*c)-I)^8+136/(tan(1/2*d*x+1/2*c)-I)^5-76*I/(tan(1/2*d*x+1/
2*c)-I)^4+7*I/(tan(1/2*d*x+1/2*c)-I)^2+496/3*I/(tan(1/2*d*x+1/2*c)-I)^6-928
/7/(tan(1/2*d*x+1/2*c)-I)^7+1/(tan(1/2*d*x+1/2*c)-I))
```

maxima [A] time = 0.68, size = 53, normalized size = 0.78

$$\frac{7 i \cos(9 dx + 9 c) + 9 i \cos(7 dx + 7 c) + 7 \sin(9 dx + 9 c) + 9 \sin(7 dx + 7 c)}{126 a^8 d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] 1/126*(7*I*cos(9*d*x + 9*c) + 9*I*cos(7*d*x + 7*c) + 7*sin(9*d*x + 9*c) + 9
*sin(7*d*x + 7*c))/(a^8*d)
```

mupad [B] time = 3.74, size = 37, normalized size = 0.54

$$\frac{2\left(\frac{e^{-c\,7i - d\,x\,7i}\,9i}{4} + \frac{e^{-c\,9i - d\,x\,9i}\,7i}{4}\right)}{63\,a^8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^7*(a + a*tan(c + d*x)*1i)^8),x)
```

```
[Out] (2*((exp(- c*7i - d*x*7i)*9i)/4 + (exp(- c*9i - d*x*9i)*7i)/4))/(63*a^8*d)
```

sympy [A] time = 35.77, size = 311, normalized size = 4.57

$$\begin{cases} -\frac{\tan(c+dx)\sec^7(c+dx)}{63a^8d\tan^8(c+dx) - 504ia^8d\tan^7(c+dx) - 1764a^8d\tan^6(c+dx) + 3528ia^8d\tan^5(c+dx) + 4410a^8d\tan^4(c+dx) - 3528ia^8d\tan^3(c+dx) - 1764a^8d\tan^2} \\ \frac{x\sec^7(c)}{(ia\tan(c)+a)^8} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**7/(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Piecewise((-tan(c + d*x)*sec(c + d*x)**7/(63*a**8*d*tan(c + d*x)**8 - 504*I
*a**8*d*tan(c + d*x)**7 - 1764*a**8*d*tan(c + d*x)**6 + 3528*I*a**8*d*tan(c
 + d*x)**5 + 4410*a**8*d*tan(c + d*x)**4 - 3528*I*a**8*d*tan(c + d*x)**3 -
1764*a**8*d*tan(c + d*x)**2 + 504*I*a**8*d*tan(c + d*x) + 63*a**8*d) + 8*I*
sec(c + d*x)**7/(63*a**8*d*tan(c + d*x)**8 - 504*I*a**8*d*tan(c + d*x)**7 -
 1764*a**8*d*tan(c + d*x)**6 + 3528*I*a**8*d*tan(c + d*x)**5 + 4410*a**8*d*
tan(c + d*x)**4 - 3528*I*a**8*d*tan(c + d*x)**3 - 1764*a**8*d*tan(c + d*x)*
*2 + 504*I*a**8*d*tan(c + d*x) + 63*a**8*d), Ne(d, 0)), (x*sec(c)**7/(I*a*t
an(c) + a)**8, True))
```

3.180 $\int \frac{\sec^5(c+dx)}{(a+ia\tan(c+dx))^8}\,dx$

Optimal. Leaf size=138

$$\frac{2i\sec^5(c+dx)}{1155a^3d(a+ia\tan(c+dx))^5}+\frac{2i\sec^5(c+dx)}{231a^2d(a+ia\tan(c+dx))^6}+\frac{i\sec^5(c+dx)}{33ad(a+ia\tan(c+dx))^7}+\frac{i\sec^5(c+dx)}{11d(a+ia\tan(c+dx))^8}$$

```
[Out] 1/11*I*sec(d*x+c)^5/d/(a+I*a*tan(d*x+c))^8+1/33*I*sec(d*x+c)^5/a/d/(a+I*a*t
an(d*x+c))^7+2/231*I*sec(d*x+c)^5/a^2/d/(a+I*a*tan(d*x+c))^6+2/1155*I*sec(d
*x+c)^5/a^3/d/(a+I*a*tan(d*x+c))^5
```

Rubi [A] time = 0.18, antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3502, 3488}

$$\frac{2i\sec^5(c+dx)}{1155a^3d(a+ia\tan(c+dx))^5}+\frac{2i\sec^5(c+dx)}{231a^2d(a+ia\tan(c+dx))^6}+\frac{i\sec^5(c+dx)}{33ad(a+ia\tan(c+dx))^7}+\frac{i\sec^5(c+dx)}{11d(a+ia\tan(c+dx))^8}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^5/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((I/11)*Sec[c + d*x]^5)/(d*(a + I*a*Tan[c + d*x])^8) + ((I/33)*Sec[c + d*x]
^5)/(a*d*(a + I*a*Tan[c + d*x])^7) + (((2*I)/231)*Sec[c + d*x]^5)/(a^2*d*(a
 + I*a*Tan[c + d*x])^6) + (((2*I)/1155)*Sec[c + d*x]^5)/(a^3*d*(a + I*a*Tan
[c + d*x])^5)
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3502

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

Rubi steps

$$\begin{aligned}
\int \frac{\sec^5(c+dx)}{(a+ia\tan(c+dx))^8}\,dx &= \frac{i\sec^5(c+dx)}{11d(a+ia\tan(c+dx))^8}+\frac{3\int \frac{\sec^5(c+dx)}{(a+ia\tan(c+dx))^7}\,dx}{11a}\\
&= \frac{i\sec^5(c+dx)}{11d(a+ia\tan(c+dx))^8}+\frac{i\sec^5(c+dx)}{33ad(a+ia\tan(c+dx))^7}+\frac{2\int \frac{\sec^5(c+dx)}{(a+ia\tan(c+dx))^6}\,dx}{33a^2}\\
&= \frac{i\sec^5(c+dx)}{11d(a+ia\tan(c+dx))^8}+\frac{i\sec^5(c+dx)}{33ad(a+ia\tan(c+dx))^7}+\frac{2i\sec^5(c+dx)}{231a^2d(a+ia\tan(c+dx))^6}\\
&= \frac{i\sec^5(c+dx)}{11d(a+ia\tan(c+dx))^8}+\frac{i\sec^5(c+dx)}{33ad(a+ia\tan(c+dx))^7}+\frac{2i\sec^5(c+dx)}{231a^2d(a+ia\tan(c+dx))^6}
\end{aligned}$$

Mathematica [A] time = 0.32, size = 73, normalized size = 0.53

$$\frac{i\sec^8(c+dx)(55i\sin(c+dx)+63i\sin(3(c+dx))+440\cos(c+dx)+168\cos(3(c+dx)))}{4620a^8d(\tan(c+dx)-i)^8}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^5/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((I/4620)*Sec[c + d*x]^8*(440*Cos[c + d*x] + 168*Cos[3*(c + d*x)] + (55*I)*
Sin[c + d*x] + (63*I)*Sin[3*(c + d*x)]))/(a^8*d*(-I + Tan[c + d*x])^8)
```

fricas [A] time = 0.46, size = 52, normalized size = 0.38

$$\frac{\left(231i\,e^{(6i\,dx+6i\,c)}+495i\,e^{(4i\,dx+4i\,c)}+385i\,e^{(2i\,dx+2i\,c)}+105i\right)e^{(-11i\,dx-11i\,c)}}{9240\,a^8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/9240*(231*I*e^(6*I*d*x + 6*I*c) + 495*I*e^(4*I*d*x + 4*I*c) + 385*I*e^(2*
I*d*x + 2*I*c) + 105*I)*e^(-11*I*d*x - 11*I*c)/(a^8*d)
```

giac [A] time = 4.87, size = 151, normalized size = 1.09

$$2\left(1155\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^{10}-3465i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^{9}-13860\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^{8}+23100i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^{7}+3\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 2/1155*(1155*tan(1/2*d*x + 1/2*c)^10 - 3465*I*tan(1/2*d*x + 1/2*c)^9 - 1386
0*tan(1/2*d*x + 1/2*c)^8 + 23100*I*tan(1/2*d*x + 1/2*c)^7 + 37422*tan(1/2*d
*x + 1/2*c)^6 - 32802*I*tan(1/2*d*x + 1/2*c)^5 - 27060*tan(1/2*d*x + 1/2*c)
^4 + 11220*I*tan(1/2*d*x + 1/2*c)^3 + 4895*tan(1/2*d*x + 1/2*c)^2 - 517*I*t
an(1/2*d*x + 1/2*c) - 152)/(a^8*d*(tan(1/2*d*x + 1/2*c) - I)^11)
```

maple [A] time = 0.52, size = 189, normalized size = 1.37

$$\frac{-\frac{4752}{7\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^7}+\frac{14i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^2}-\frac{176i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^4}-\frac{256}{11\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{11}}+\frac{584i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^6}+\frac{1864}{5\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^5}+\frac{2}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}}{a^8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 2/d/a^8*(-2376/7/(tan(1/2*d*x+1/2*c)-I)^7+7*I/(tan(1/2*d*x+1/2*c)-I)^2-88*I
/(tan(1/2*d*x+1/2*c)-I)^4-128/11/(tan(1/2*d*x+1/2*c)-I)^11+292*I/(tan(1/2*d
*x+1/2*c)-I)^6+932/5/(tan(1/2*d*x+1/2*c)-I)^5+1/(tan(1/2*d*x+1/2*c)-I)-288*
I/(tan(1/2*d*x+1/2*c)-I)^8+512/3/(tan(1/2*d*x+1/2*c)-I)^9+64*I/(tan(1/2*d*x
+1/2*c)-I)^10-30/(tan(1/2*d*x+1/2*c)-I)^3)
```

maxima [A] time = 0.41, size = 97, normalized size = 0.70

$$\frac{105i\cos(11\,dx+11\,c)+385i\cos(9\,dx+9\,c)+495i\cos(7\,dx+7\,c)+231i\cos(5\,dx+5\,c)+105\sin(11\,dx}{9240\,a^8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] 1/9240*(105*I*cos(11*d*x + 11*c) + 385*I*cos(9*d*x + 9*c) + 495*I*cos(7*d*x
 + 7*c) + 231*I*cos(5*d*x + 5*c) + 105*sin(11*d*x + 11*c) + 385*sin(9*d*x +
 9*c) + 495*sin(7*d*x + 7*c) + 231*sin(5*d*x + 5*c))/(a^8*d)
```

mupad [B] time = 3.91, size = 64, normalized size = 0.46

$$\frac{\frac{e^{-c\,5i-d\,x\,5i}\,1i}{40}+\frac{e^{-c\,7i-d\,x\,7i}\,3i}{56}+\frac{e^{-c\,9i-d\,x\,9i}\,1i}{24}+\frac{e^{-c\,11i-d\,x\,11i}\,1i}{88}}{a^8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^8),x)
```

```
[Out] ((exp(- c*5i - d*x*5i)*1i)/40 + (exp(- c*7i - d*x*7i)*3i)/56 + (exp(- c*9i
- d*x*9i)*1i)/24 + (exp(- c*11i - d*x*11i)*1i)/88)/(a^8*d)
```

sympy [A] time = 35.83, size = 620, normalized size = 4.49

$$\begin{cases} \frac{2\tan^3(c+dx)\sec^5(c+dx)}{1155a^8d\tan^8(c+dx)-9240ia^8d\tan^7(c+dx)-32340a^8d\tan^6(c+dx)+64680ia^8d\tan^5(c+dx)+80850a^8d\tan^4(c+dx)-64680ia^8d\tan^3(c+dx)-32340a^8d\,t} \\ \frac{x\sec^5(c)}{(ia\tan(c)+a)^8} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**5/(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Piecewise((2*tan(c + d*x)**3*sec(c + d*x)**5/(1155*a**8*d*tan(c + d*x)**8 -
 9240*I*a**8*d*tan(c + d*x)**7 - 32340*a**8*d*tan(c + d*x)**6 + 64680*I*a**
8*d*tan(c + d*x)**5 + 80850*a**8*d*tan(c + d*x)**4 - 64680*I*a**8*d*tan(c +
 d*x)**3 - 32340*a**8*d*tan(c + d*x)**2 + 9240*I*a**8*d*tan(c + d*x) + 1155
*a**8*d) - 16*I*tan(c + d*x)**2*sec(c + d*x)**5/(1155*a**8*d*tan(c + d*x)**
8 - 9240*I*a**8*d*tan(c + d*x)**7 - 32340*a**8*d*tan(c + d*x)**6 + 64680*I*
a**8*d*tan(c + d*x)**5 + 80850*a**8*d*tan(c + d*x)**4 - 64680*I*a**8*d*tan(
c + d*x)**3 - 32340*a**8*d*tan(c + d*x)**2 + 9240*I*a**8*d*tan(c + d*x) + 1
155*a**8*d) - 61*tan(c + d*x)*sec(c + d*x)**5/(1155*a**8*d*tan(c + d*x)**8
- 9240*I*a**8*d*tan(c + d*x)**7 - 32340*a**8*d*tan(c + d*x)**6 + 64680*I*a*
*8*d*tan(c + d*x)**5 + 80850*a**8*d*tan(c + d*x)**4 - 64680*I*a**8*d*tan(c
+ d*x)**3 - 32340*a**8*d*tan(c + d*x)**2 + 9240*I*a**8*d*tan(c + d*x) + 115
5*a**8*d) + 152*I*sec(c + d*x)**5/(1155*a**8*d*tan(c + d*x)**8 - 9240*I*a**
8*d*tan(c + d*x)**7 - 32340*a**8*d*tan(c + d*x)**6 + 64680*I*a**8*d*tan(c +
 d*x)**5 + 80850*a**8*d*tan(c + d*x)**4 - 64680*I*a**8*d*tan(c + d*x)**3 -
32340*a**8*d*tan(c + d*x)**2 + 9240*I*a**8*d*tan(c + d*x) + 1155*a**8*d), N
e(d, 0)), (x*sec(c)**5/(I*a*tan(c) + a)**8, True))
```

3.181 $\int \frac{\sec^3(c+dx)}{(a+ia\tan(c+dx))^8}\,dx$

Optimal. Leaf size=213

$$\frac{20i\sec^3(c+dx)}{3003a^3d(a+ia\tan(c+dx))^5}+\frac{8i\sec^3(c+dx)}{9009a^2d\left(a^2+ia^2\tan(c+dx)\right)^3}+\frac{8i\sec^3(c+dx)}{3003d\left(a^2+ia^2\tan(c+dx)\right)^4}+\frac{20i\sec}{1287a^2d(a+}$$

```
[Out] 1/13*I*sec(d*x+c)^3/d/(a+I*a*tan(d*x+c))^8+5/143*I*sec(d*x+c)^3/a/d/(a+I*a*
tan(d*x+c))^7+20/1287*I*sec(d*x+c)^3/a^2/d/(a+I*a*tan(d*x+c))^6+20/3003*I*s
ec(d*x+c)^3/a^3/d/(a+I*a*tan(d*x+c))^5+8/3003*I*sec(d*x+c)^3/d/(a^2+I*a^2*t
an(d*x+c))^4+8/9009*I*sec(d*x+c)^3/a^2/d/(a^2+I*a^2*tan(d*x+c))^3
```

Rubi [A] time = 0.28, antiderivative size = 213, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3502, 3488}

$$\frac{8i\sec^3(c+dx)}{9009a^2d\left(a^2+ia^2\tan(c+dx)\right)^3}+\frac{8i\sec^3(c+dx)}{3003d\left(a^2+ia^2\tan(c+dx)\right)^4}+\frac{20i\sec^3(c+dx)}{3003a^3d(a+ia\tan(c+dx))^5}+\frac{20i\sec}{1287a^2d(a+}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((I/13)*Sec[c + d*x]^3)/(d*(a + I*a*Tan[c + d*x])^8) + (((5*I)/143)*Sec[c +
 d*x]^3)/(a*d*(a + I*a*Tan[c + d*x])^7) + (((20*I)/1287)*Sec[c + d*x]^3)/(a
^2*d*(a + I*a*Tan[c + d*x])^6) + (((20*I)/3003)*Sec[c + d*x]^3)/(a^3*d*(a +
 I*a*Tan[c + d*x])^5) + (((8*I)/3003)*Sec[c + d*x]^3)/(d*(a^2 + I*a^2*Tan[c
 + d*x])^4) + (((8*I)/9009)*Sec[c + d*x]^3)/(a^2*d*(a^2 + I*a^2*Tan[c + d*x
])^3)
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3502

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

Rubi steps

$$\int \frac{\sec^3(c+dx)}{(a+ia\tan(c+dx))^8}\,dx = \frac{i\sec^3(c+dx)}{13d(a+ia\tan(c+dx))^8} + \frac{5\int \frac{\sec^3(c+dx)}{(a+ia\tan(c+dx))^7}\,dx}{13a}$$

$$= \frac{i\sec^3(c+dx)}{13d(a+ia\tan(c+dx))^8} + \frac{5i\sec^3(c+dx)}{143ad(a+ia\tan(c+dx))^7} + \frac{20\int \frac{\sec^3(c+dx)}{(a+ia\tan(c+dx))^6}\,dx}{143a^2}$$

$$= \frac{i\sec^3(c+dx)}{13d(a+ia\tan(c+dx))^8} + \frac{5i\sec^3(c+dx)}{143ad(a+ia\tan(c+dx))^7} + \frac{20i\sec^3(c+dx)}{1287a^2d(a+ia\tan(c+dx$$

$$= \frac{i\sec^3(c+dx)}{13d(a+ia\tan(c+dx))^8} + \frac{5i\sec^3(c+dx)}{143ad(a+ia\tan(c+dx))^7} + \frac{20i\sec^3(c+dx)}{1287a^2d(a+ia\tan(c+dx$$

$$= \frac{i\sec^3(c+dx)}{13d(a+ia\tan(c+dx))^8} + \frac{5i\sec^3(c+dx)}{143ad(a+ia\tan(c+dx))^7} + \frac{20i\sec^3(c+dx)}{1287a^2d(a+ia\tan(c+dx$$

$$= \frac{i\sec^3(c+dx)}{13d(a+ia\tan(c+dx))^8} + \frac{5i\sec^3(c+dx)}{143ad(a+ia\tan(c+dx))^7} + \frac{20i\sec^3(c+dx)}{1287a^2d(a+ia\tan(c+dx$$

Mathematica [A] time = 0.32, size = 95, normalized size = 0.45

$$\frac{i\sec^8(c+dx)(1430i\sin(c+dx)+2457i\sin(3(c+dx))+1155i\sin(5(c+dx))+11440\cos(c+dx)+6552\cos(3(}{144144a^8d(\tan(c+dx)-i)^8}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^3/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((I/144144)*Sec[c + d*x]^8*(11440*Cos[c + d*x] + 6552*Cos[3*(c + d*x)] + 18
48*Cos[5*(c + d*x)] + (1430*I)*Sin[c + d*x] + (2457*I)*Sin[3*(c + d*x)] + (
1155*I)*Sin[5*(c + d*x)]))/(a^8*d*(-I + Tan[c + d*x])^8)
```

fricas [A] time = 0.58, size = 74, normalized size = 0.35

$$\frac{\left(3003i\,e^{(10i\,dx+10i\,c)}+9009i\,e^{(8i\,dx+8i\,c)}+12870i\,e^{(6i\,dx+6i\,c)}+10010i\,e^{(4i\,dx+4i\,c)}+4095i\,e^{(2i\,dx+2i\,c)}+693i\right)e^{(-13i\,dx-13i}}{288288\,a^8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/288288*(3003*I*e^(10*I*d*x + 10*I*c) + 9009*I*e^(8*I*d*x + 8*I*c) + 12870
*I*e^(6*I*d*x + 6*I*c) + 10010*I*e^(4*I*d*x + 4*I*c) + 4095*I*e^(2*I*d*x +
2*I*c) + 693*I)*e^(-13*I*d*x - 13*I*c)/(a^8*d)
```

giac [A] time = 3.95, size = 177, normalized size = 0.83

$$2\left(9009\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{12}-45045i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{11}-183183\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{10}+435435i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 2/9009*(9009*tan(1/2*d*x + 1/2*c)^12 - 45045*I*tan(1/2*d*x + 1/2*c)^11 - 18
3183*tan(1/2*d*x + 1/2*c)^10 + 435435*I*tan(1/2*d*x + 1/2*c)^9 + 810810*tan
```

```
(1/2*d*x + 1/2*c)^8 - 1051050*I*tan(1/2*d*x + 1/2*c)^7 - 1076790*tan(1/2*d*
x + 1/2*c)^6 + 785070*I*tan(1/2*d*x + 1/2*c)^5 + 451165*tan(1/2*d*x + 1/2*c
)^4 - 171457*I*tan(1/2*d*x + 1/2*c)^3 - 51675*tan(1/2*d*x + 1/2*c)^2 + 7111
*I*tan(1/2*d*x + 1/2*c) + 1240)/(a^8*d*(tan(1/2*d*x + 1/2*c) - I)^13)
```

maple [A] time = 0.54, size = 222, normalized size = 1.04

$$\frac{\frac{2}{\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i}+\frac{864i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{10}}+\frac{14i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{2}}+\frac{480}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{5}}-\frac{4544}{11\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{11}}-\frac{200i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{4}}+\frac{2672i}{3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{6}}}{a^8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 2/d/a^8*(1/(tan(1/2*d*x+1/2*c)-I)+432*I/(tan(1/2*d*x+1/2*c)-I)^10+7*I/(tan(
1/2*d*x+1/2*c)-I)^2+240/(tan(1/2*d*x+1/2*c)-I)^5-2272/11/(tan(1/2*d*x+1/2*c
)-I)^11-100*I/(tan(1/2*d*x+1/2*c)-I)^4+1336/3*I/(tan(1/2*d*x+1/2*c)-I)^6+12
8/13/(tan(1/2*d*x+1/2*c)-I)^13-64*I/(tan(1/2*d*x+1/2*c)-I)^12-94/3/(tan(1/2
*d*x+1/2*c)-I)^3-736*I/(tan(1/2*d*x+1/2*c)-I)^8-4528/7/(tan(1/2*d*x+1/2*c)-
I)^7+5840/9/(tan(1/2*d*x+1/2*c)-I)^9)
```

maxima [A] time = 0.42, size = 141, normalized size = 0.66

$$\frac{693i\cos(13\,dx+13\,c)+4095i\cos(11\,dx+11\,c)+10010i\cos(9\,dx+9\,c)+12870i\cos(7\,dx+7\,c)+9009i}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] 1/288288*(693*I*cos(13*d*x + 13*c) + 4095*I*cos(11*d*x + 11*c) + 10010*I*co
s(9*d*x + 9*c) + 12870*I*cos(7*d*x + 7*c) + 9009*I*cos(5*d*x + 5*c) + 3003*
I*cos(3*d*x + 3*c) + 693*sin(13*d*x + 13*c) + 4095*sin(11*d*x + 11*c) + 100
10*sin(9*d*x + 9*c) + 12870*sin(7*d*x + 7*c) + 9009*sin(5*d*x + 5*c) + 3003
*sin(3*d*x + 3*c))/(a^8*d)
```

mupad [B] time = 4.22, size = 159, normalized size = 0.75

$$\frac{\frac{\cos(3c+3dx)^3\,5\mathrm{i}}{36}+\frac{5\sin(3c+3dx)\cos(3c+3dx)^2}{36}-\frac{\cos(3c+3dx)\,3\mathrm{i}}{32}+\frac{\cos(5c+5dx)\,1\mathrm{i}}{32}+\frac{\cos(7c+7dx)\,5\mathrm{i}}{112}+\frac{\cos(11c+11dx)\,5\mathrm{i}}{352}+\cos(1}{a^8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^8),x)
```

```
[Out] ((cos(5*c + 5*d*x)*1i)/32 - (cos(3*c + 3*d*x)*3i)/32 + (cos(7*c + 7*d*x)*5i
)/112 + (cos(11*c + 11*d*x)*5i)/352 + (cos(13*c + 13*d*x)*1i)/416 - (7*sin(
3*c + 3*d*x))/288 + sin(5*c + 5*d*x)/32 + (5*sin(7*c + 7*d*x))/112 + (5*sin
(11*c + 11*d*x))/352 + sin(13*c + 13*d*x)/416 + (cos(3*c + 3*d*x)^3*5i)/36
+ (5*cos(3*c + 3*d*x)^2*sin(3*c + 3*d*x))/36)/(a^8*d)
```

sympy [A] time = 36.21, size = 928, normalized size = 4.36

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3/(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Piecewise((-8*tan(c + d*x)**5*sec(c + d*x)**3/(9009*a**8*d*tan(c + d*x)**8
- 72072*I*a**8*d*tan(c + d*x)**7 - 252252*a**8*d*tan(c + d*x)**6 + 504504*I
```

```
*a**8*d*tan(c + d*x)**5 + 630630*a**8*d*tan(c + d*x)**4 - 504504*I*a**8*d*t
an(c + d*x)**3 - 252252*a**8*d*tan(c + d*x)**2 + 72072*I*a**8*d*tan(c + d*x
) + 9009*a**8*d) + 64*I*tan(c + d*x)**4*sec(c + d*x)**3/(9009*a**8*d*tan(c
+ d*x)**8 - 72072*I*a**8*d*tan(c + d*x)**7 - 252252*a**8*d*tan(c + d*x)**6
+ 504504*I*a**8*d*tan(c + d*x)**5 + 630630*a**8*d*tan(c + d*x)**4 - 504504*
I*a**8*d*tan(c + d*x)**3 - 252252*a**8*d*tan(c + d*x)**2 + 72072*I*a**8*d*t
an(c + d*x) + 9009*a**8*d) + 236*tan(c + d*x)**3*sec(c + d*x)**3/(9009*a**8
*d*tan(c + d*x)**8 - 72072*I*a**8*d*tan(c + d*x)**7 - 252252*a**8*d*tan(c +
 d*x)**6 + 504504*I*a**8*d*tan(c + d*x)**5 + 630630*a**8*d*tan(c + d*x)**4
- 504504*I*a**8*d*tan(c + d*x)**3 - 252252*a**8*d*tan(c + d*x)**2 + 72072*I
*a**8*d*tan(c + d*x) + 9009*a**8*d) - 544*I*tan(c + d*x)**2*sec(c + d*x)**3
/(9009*a**8*d*tan(c + d*x)**8 - 72072*I*a**8*d*tan(c + d*x)**7 - 252252*a**
8*d*tan(c + d*x)**6 + 504504*I*a**8*d*tan(c + d*x)**5 + 630630*a**8*d*tan(c
 + d*x)**4 - 504504*I*a**8*d*tan(c + d*x)**3 - 252252*a**8*d*tan(c + d*x)**
2 + 72072*I*a**8*d*tan(c + d*x) + 9009*a**8*d) - 911*tan(c + d*x)*sec(c + d
*x)**3/(9009*a**8*d*tan(c + d*x)**8 - 72072*I*a**8*d*tan(c + d*x)**7 - 2522
52*a**8*d*tan(c + d*x)**6 + 504504*I*a**8*d*tan(c + d*x)**5 + 630630*a**8*d
*tan(c + d*x)**4 - 504504*I*a**8*d*tan(c + d*x)**3 - 252252*a**8*d*tan(c +
d*x)**2 + 72072*I*a**8*d*tan(c + d*x) + 9009*a**8*d) + 1240*I*sec(c + d*x)*
*3/(9009*a**8*d*tan(c + d*x)**8 - 72072*I*a**8*d*tan(c + d*x)**7 - 252252*a
**8*d*tan(c + d*x)**6 + 504504*I*a**8*d*tan(c + d*x)**5 + 630630*a**8*d*tan
(c + d*x)**4 - 504504*I*a**8*d*tan(c + d*x)**3 - 252252*a**8*d*tan(c + d*x)
**2 + 72072*I*a**8*d*tan(c + d*x) + 9009*a**8*d), Ne(d, 0)), (x*sec(c)**3/(
I*a*tan(c) + a)**8, True))
```

3.182 $\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^8}\,dx$

Optimal. Leaf size=269

$$\frac{16i\sec(c+dx)}{6435d\left(a^8+ia^8\tan(c+dx)\right)}+\frac{16i\sec(c+dx)}{6435d\left(a^4+ia^4\tan(c+dx)\right)^2}+\frac{14i\sec(c+dx)}{1287a^3d(a+ia\tan(c+dx))^5}+\frac{8i\sec(c}{2145a^2d\left(a^2+ia\right.}$$

```
[Out] 1/15*I*sec(d*x+c)/d/(a+I*a*tan(d*x+c))^8+7/195*I*sec(d*x+c)/a/d/(a+I*a*tan(
d*x+c))^7+14/715*I*sec(d*x+c)/a^2/d/(a+I*a*tan(d*x+c))^6+14/1287*I*sec(d*x+
c)/a^3/d/(a+I*a*tan(d*x+c))^5+8/1287*I*sec(d*x+c)/d/(a^2+I*a^2*tan(d*x+c))^
4+8/2145*I*sec(d*x+c)/a^2/d/(a^2+I*a^2*tan(d*x+c))^3+16/6435*I*sec(d*x+c)/d
/(a^4+I*a^4*tan(d*x+c))^2+16/6435*I*sec(d*x+c)/d/(a^8+I*a^8*tan(d*x+c))
```

Rubi [A] time = 0.26, antiderivative size = 269, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {3502, 3488}

$$\frac{16i\sec(c+dx)}{6435d\left(a^8+ia^8\tan(c+dx)\right)}+\frac{16i\sec(c+dx)}{6435d\left(a^4+ia^4\tan(c+dx)\right)^2}+\frac{8i\sec(c+dx)}{2145a^2d\left(a^2+ia^2\tan(c+dx)\right)^3}+\frac{8i\sec}{1287d\left(a^2+ia\right.}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((I/15)*Sec[c + d*x])/(d*(a + I*a*Tan[c + d*x])^8) + (((7*I)/195)*Sec[c + d
*x])/(a*d*(a + I*a*Tan[c + d*x])^7) + (((14*I)/715)*Sec[c + d*x])/(a^2*d*(a
 + I*a*Tan[c + d*x])^6) + (((14*I)/1287)*Sec[c + d*x])/(a^3*d*(a + I*a*Tan[
c + d*x])^5) + (((8*I)/1287)*Sec[c + d*x])/(d*(a^2 + I*a^2*Tan[c + d*x])^4)
 + (((8*I)/2145)*Sec[c + d*x])/(a^2*d*(a^2 + I*a^2*Tan[c + d*x])^3) + (((16
*I)/6435)*Sec[c + d*x])/(d*(a^4 + I*a^4*Tan[c + d*x])^2) + (((16*I)/6435)*S
ec[c + d*x])/(d*(a^8 + I*a^8*Tan[c + d*x]))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3502

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

Rubi steps

$$\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^8}\,dx = \frac{i\sec(c+dx)}{15d(a+ia\tan(c+dx))^8} + \frac{7\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^7}\,dx}{15a}$$

$$= \frac{i\sec(c+dx)}{15d(a+ia\tan(c+dx))^8} + \frac{7i\sec(c+dx)}{195ad(a+ia\tan(c+dx))^7} + \frac{14\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^6}\,dx}{65a^2}$$

$$= \frac{i\sec(c+dx)}{15d(a+ia\tan(c+dx))^8} + \frac{7i\sec(c+dx)}{195ad(a+ia\tan(c+dx))^7} + \frac{14i\sec(c+dx)}{715a^2d(a+ia\tan(c+dx)}$$

$$= \frac{i\sec(c+dx)}{15d(a+ia\tan(c+dx))^8} + \frac{7i\sec(c+dx)}{195ad(a+ia\tan(c+dx))^7} + \frac{14i\sec(c+dx)}{715a^2d(a+ia\tan(c+dx)}$$

$$= \frac{i\sec(c+dx)}{15d(a+ia\tan(c+dx))^8} + \frac{7i\sec(c+dx)}{195ad(a+ia\tan(c+dx))^7} + \frac{14i\sec(c+dx)}{715a^2d(a+ia\tan(c+dx)}$$

$$= \frac{i\sec(c+dx)}{15d(a+ia\tan(c+dx))^8} + \frac{7i\sec(c+dx)}{195ad(a+ia\tan(c+dx))^7} + \frac{14i\sec(c+dx)}{715a^2d(a+ia\tan(c+dx)}$$

$$= \frac{i\sec(c+dx)}{15d(a+ia\tan(c+dx))^8} + \frac{7i\sec(c+dx)}{195ad(a+ia\tan(c+dx))^7} + \frac{14i\sec(c+dx)}{715a^2d(a+ia\tan(c+dx)}$$

$$= \frac{i\sec(c+dx)}{15d(a+ia\tan(c+dx))^8} + \frac{7i\sec(c+dx)}{195ad(a+ia\tan(c+dx))^7} + \frac{14i\sec(c+dx)}{715a^2d(a+ia\tan(c+dx)}$$

Mathematica [A] time = 0.64, size = 117, normalized size = 0.43

$$\frac{i\sec^8(c+dx)(3575i\sin(c+dx)+7371i\sin(3(c+dx))+5775i\sin(5(c+dx))+3003i\sin(7(c+dx))+28600\cos}{411840a^8d(\tan(c+dx)-i)^8}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((I/411840)*Sec[c + d*x]^8*(28600*Cos[c + d*x] + 19656*Cos[3*(c + d*x)] + 9
240*Cos[5*(c + d*x)] + 3432*Cos[7*(c + d*x)] + (3575*I)*Sin[c + d*x] + (737
1*I)*Sin[3*(c + d*x)] + (5775*I)*Sin[5*(c + d*x)] + (3003*I)*Sin[7*(c + d*x
)]))/(a^8*d*(-I + Tan[c + d*x])^8)
```

fricas [A] time = 0.59, size = 96, normalized size = 0.36

$$\frac{\left(6435i\,e^{(14i\,dx+14i\,c)}+15015i\,e^{(12i\,dx+12i\,c)}+27027i\,e^{(10i\,dx+10i\,c)}+32175i\,e^{(8i\,dx+8i\,c)}+25025i\,e^{(6i\,dx+6i\,c)}+12285i\,e^{(4}\right.}{823680\,a^8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/823680*(6435*I*e^(14*I*d*x + 14*I*c) + 15015*I*e^(12*I*d*x + 12*I*c) + 27
027*I*e^(10*I*d*x + 10*I*c) + 32175*I*e^(8*I*d*x + 8*I*c) + 25025*I*e^(6*I*
d*x + 6*I*c) + 12285*I*e^(4*I*d*x + 4*I*c) + 3465*I*e^(2*I*d*x + 2*I*c) + 4
29*I)*e^(-15*I*d*x - 15*I*c)/(a^8*d)
```

giac [A] time = 3.58, size = 203, normalized size = 0.75

$$\frac{2\left(6435\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{14}-45045i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{13}-210210\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{12}+630630i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{11}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^8,x, algorithm="giac")

[Out] 2/6435*(6435*tan(1/2*d*x + 1/2*c)^14 - 45045*I*tan(1/2*d*x + 1/2*c)^13 - 210210*tan(1/2*d*x + 1/2*c)^12 + 630630*I*tan(1/2*d*x + 1/2*c)^11 + 1414413*tan(1/2*d*x + 1/2*c)^10 - 2357355*I*tan(1/2*d*x + 1/2*c)^9 - 3063060*tan(1/2*d*x + 1/2*c)^8 + 3063060*I*tan(1/2*d*x + 1/2*c)^7 + 2407405*tan(1/2*d*x + 1/2*c)^6 - 1444443*I*tan(1/2*d*x + 1/2*c)^5 - 668850*tan(1/2*d*x + 1/2*c)^4 + 222950*I*tan(1/2*d*x + 1/2*c)^3 + 54915*tan(1/2*d*x + 1/2*c)^2 - 7845*I*tan(1/2*d*x + 1/2*c) - 952)/(a^8*d*(tan(1/2*d*x + 1/2*c) - I)^15)

maple [A] time = 0.25, size = 255, normalized size = 0.95

$$\frac{15008i}{5\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{10}}-\frac{2944i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{8}}+\frac{29792}{9\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{9}}+\frac{14i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{2}}-\frac{224i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{4}}+\frac{3752i}{3\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{6}}-\frac{23744}{11\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(sec(d*x+c)/(a+I*a*tan(d*x+c))^8,x)

[Out] 2/d/a^8*(7504/5*I/(tan(1/2*d*x+1/2*c)-I)^10-1472*I/(tan(1/2*d*x+1/2*c)-I)^8+14896/9/(tan(1/2*d*x+1/2*c)-I)^9+7*I/(tan(1/2*d*x+1/2*c)-I)^2-112*I/(tan(1/2*d*x+1/2*c)-I)^4+1876/3*I/(tan(1/2*d*x+1/2*c)-I)^6-11872/11/(tan(1/2*d*x+1/2*c)-I)^11-1064/(tan(1/2*d*x+1/2*c)-I)^7-128/15/(tan(1/2*d*x+1/2*c)-I)^15-98/3/(tan(1/2*d*x+1/2*c)-I)^3+1484/5/(tan(1/2*d*x+1/2*c)-I)^5+1/(tan(1/2*d*x+1/2*c)-I)+64*I/(tan(1/2*d*x+1/2*c)-I)^14+3136/13/(tan(1/2*d*x+1/2*c)-I)^13-1792/3*I/(tan(1/2*d*x+1/2*c)-I)^12)

maxima [A] time = 0.65, size = 179, normalized size = 0.67

$$429i\cos(15\,dx+15\,c)+3465i\cos(13\,dx+13\,c)+12285i\cos(11\,dx+11\,c)+25025i\cos(9\,dx+9\,c)+321$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")

[Out] 1/823680*(429*I*cos(15*d*x + 15*c) + 3465*I*cos(13*d*x + 13*c) + 12285*I*cos(11*d*x + 11*c) + 25025*I*cos(9*d*x + 9*c) + 32175*I*cos(7*d*x + 7*c) + 27027*I*cos(5*d*x + 5*c) + 15015*I*cos(3*d*x + 3*c) + 6435*I*cos(d*x + c) + 429*sin(15*d*x + 15*c) + 3465*sin(13*d*x + 13*c) + 12285*sin(11*d*x + 11*c) + 25025*sin(9*d*x + 9*c) + 32175*sin(7*d*x + 7*c) + 27027*sin(5*d*x + 5*c) + 15015*sin(3*d*x + 3*c) + 6435*sin(d*x + c))/(a^8*d)

mupad [B] time = 5.36, size = 224, normalized size = 0.83

$$2\left(2\sin\left(\frac{c}{4}+\frac{d\,x}{4}\right)^2-1\right)\left(-\frac{\sin(c+d\,x)^2\,44779\mathrm{i}}{32}+\frac{32175\,\sin(c+d\,x)}{128}-\frac{\sin(2\,c+2\,d\,x)^2\,26075\mathrm{i}}{16}-\frac{3575\,\sin(2\,c+2\,d\,x)}{8}+\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2\,114}{64}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^8),x)

[Out] (2*(2*sin(c/4 + (d*x)/4)^2 - 1)*((32175*sin(c + d*x))/128 - (3575*sin(2*c + 2*d*x))/8 + (84227*sin(3*c + 3*d*x))/128 - 754*sin(4*c + 4*d*x) + (111527*sin(5*c + 5*d*x))/128 - (7187*sin(6*c + 6*d*x))/8 + (121427*sin(7*c + 7*d*x))/128 - (sin(2*c + 2*d*x)^2*26075i)/16 + (sin(c/2 + (d*x)/2)^2*114583i)/64

```
 - (sin(3*c + 3*d*x)^2*57925i)/32 + (sin((3*c)/2 + (3*d*x)/2)^2*116585i)/64
 + (sin((5*c)/2 + (5*d*x)/2)^2*119315i)/64 + (sin((7*c)/2 + (7*d*x)/2)^2*12
2285i)/64 - (sin(c + d*x)^2*44779i)/32 - 952i))/(6435*a^8*d*(sin((15*c)/2 +
 (15*d*x)/2)*1i - 2*sin((15*c)/4 + (15*d*x)/4)^2 + 1))
```

sympy [A] time = 36.32, size = 1221, normalized size = 4.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Piecewise((16*tan(c + d*x)**7*sec(c + d*x)/(6435*a**8*d*tan(c + d*x)**8 - 5
1480*I*a**8*d*tan(c + d*x)**7 - 180180*a**8*d*tan(c + d*x)**6 + 360360*I*a*
*8*d*tan(c + d*x)**5 + 450450*a**8*d*tan(c + d*x)**4 - 360360*I*a**8*d*tan(
c + d*x)**3 - 180180*a**8*d*tan(c + d*x)**2 + 51480*I*a**8*d*tan(c + d*x) +
 6435*a**8*d) - 128*I*tan(c + d*x)**6*sec(c + d*x)/(6435*a**8*d*tan(c + d*x
)**8 - 51480*I*a**8*d*tan(c + d*x)**7 - 180180*a**8*d*tan(c + d*x)**6 + 360
360*I*a**8*d*tan(c + d*x)**5 + 450450*a**8*d*tan(c + d*x)**4 - 360360*I*a**
8*d*tan(c + d*x)**3 - 180180*a**8*d*tan(c + d*x)**2 + 51480*I*a**8*d*tan(c
+ d*x) + 6435*a**8*d) - 456*tan(c + d*x)**5*sec(c + d*x)/(6435*a**8*d*tan(c
 + d*x)**8 - 51480*I*a**8*d*tan(c + d*x)**7 - 180180*a**8*d*tan(c + d*x)**6
 + 360360*I*a**8*d*tan(c + d*x)**5 + 450450*a**8*d*tan(c + d*x)**4 - 360360
*I*a**8*d*tan(c + d*x)**3 - 180180*a**8*d*tan(c + d*x)**2 + 51480*I*a**8*d*
tan(c + d*x) + 6435*a**8*d) + 960*I*tan(c + d*x)**4*sec(c + d*x)/(6435*a**8
*d*tan(c + d*x)**8 - 51480*I*a**8*d*tan(c + d*x)**7 - 180180*a**8*d*tan(c +
 d*x)**6 + 360360*I*a**8*d*tan(c + d*x)**5 + 450450*a**8*d*tan(c + d*x)**4
- 360360*I*a**8*d*tan(c + d*x)**3 - 180180*a**8*d*tan(c + d*x)**2 + 51480*I
*a**8*d*tan(c + d*x) + 6435*a**8*d) + 1350*tan(c + d*x)**3*sec(c + d*x)/(64
35*a**8*d*tan(c + d*x)**8 - 51480*I*a**8*d*tan(c + d*x)**7 - 180180*a**8*d*
tan(c + d*x)**6 + 360360*I*a**8*d*tan(c + d*x)**5 + 450450*a**8*d*tan(c + d
*x)**4 - 360360*I*a**8*d*tan(c + d*x)**3 - 180180*a**8*d*tan(c + d*x)**2 +
51480*I*a**8*d*tan(c + d*x) + 6435*a**8*d) - 1392*I*tan(c + d*x)**2*sec(c +
 d*x)/(6435*a**8*d*tan(c + d*x)**8 - 51480*I*a**8*d*tan(c + d*x)**7 - 18018
0*a**8*d*tan(c + d*x)**6 + 360360*I*a**8*d*tan(c + d*x)**5 + 450450*a**8*d*
tan(c + d*x)**4 - 360360*I*a**8*d*tan(c + d*x)**3 - 180180*a**8*d*tan(c + d
*x)**2 + 51480*I*a**8*d*tan(c + d*x) + 6435*a**8*d) - 1181*tan(c + d*x)*sec
(c + d*x)/(6435*a**8*d*tan(c + d*x)**8 - 51480*I*a**8*d*tan(c + d*x)**7 - 1
80180*a**8*d*tan(c + d*x)**6 + 360360*I*a**8*d*tan(c + d*x)**5 + 450450*a**
8*d*tan(c + d*x)**4 - 360360*I*a**8*d*tan(c + d*x)**3 - 180180*a**8*d*tan(c
 + d*x)**2 + 51480*I*a**8*d*tan(c + d*x) + 6435*a**8*d) + 952*I*sec(c + d*x
)/(6435*a**8*d*tan(c + d*x)**8 - 51480*I*a**8*d*tan(c + d*x)**7 - 180180*a*
*8*d*tan(c + d*x)**6 + 360360*I*a**8*d*tan(c + d*x)**5 + 450450*a**8*d*tan(
c + d*x)**4 - 360360*I*a**8*d*tan(c + d*x)**3 - 180180*a**8*d*tan(c + d*x)*
*2 + 51480*I*a**8*d*tan(c + d*x) + 6435*a**8*d), Ne(d, 0)), (x*sec(c)/(I*a*
tan(c) + a)**8, True))
```

3.183 $\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^8}\,dx$

Optimal. Leaf size=271

$$-\frac{64\sin^3(c+dx)}{12155a^8d}+\frac{192\sin(c+dx)}{12155a^8d}+\frac{128i\cos^3(c+dx)}{12155d\left(a^8+ia^8\tan(c+dx)\right)}+\frac{168i\cos(c+dx)}{12155a^3d(a+ia\tan(c+dx))^5}+\frac{16}{2431a^2d\left(\right.}$$

```
[Out] 192/12155*sin(d*x+c)/a^8/d-64/12155*sin(d*x+c)^3/a^8/d+1/17*I*cos(d*x+c)/d/
(a+I*a*tan(d*x+c))^8+3/85*I*cos(d*x+c)/a/d/(a+I*a*tan(d*x+c))^7+24/1105*I*c
os(d*x+c)/a^2/d/(a+I*a*tan(d*x+c))^6+168/12155*I*cos(d*x+c)/a^3/d/(a+I*a*ta
n(d*x+c))^5+112/12155*I*cos(d*x+c)/d/(a^2+I*a^2*tan(d*x+c))^4+16/2431*I*cos
(d*x+c)/a^2/d/(a^2+I*a^2*tan(d*x+c))^3+128/12155*I*cos(d*x+c)^3/d/(a^8+I*a^
8*tan(d*x+c))
```

Rubi [A] time = 0.31, antiderivative size = 271, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.136$, Rules used = {3502, 3500, 2633}

$$-\frac{64\sin^3(c+dx)}{12155a^8d}+\frac{192\sin(c+dx)}{12155a^8d}+\frac{128i\cos^3(c+dx)}{12155d\left(a^8+ia^8\tan(c+dx)\right)}+\frac{16i\cos(c+dx)}{2431a^2d\left(a^2+ia^2\tan(c+dx)\right)^3}+\frac{1}{12155d\left(\right.}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (192*Sin[c + d*x])/(12155*a^8*d) - (64*Sin[c + d*x]^3)/(12155*a^8*d) + ((I/
17)*Cos[c + d*x])/(d*(a + I*a*Tan[c + d*x])^8) + (((3*I)/85)*Cos[c + d*x])/
(a*d*(a + I*a*Tan[c + d*x])^7) + (((24*I)/1105)*Cos[c + d*x])/(a^2*d*(a + I
*a*Tan[c + d*x])^6) + (((168*I)/12155)*Cos[c + d*x])/(a^3*d*(a + I*a*Tan[c
+ d*x])^5) + (((112*I)/12155)*Cos[c + d*x])/(d*(a^2 + I*a^2*Tan[c + d*x])^4
) + (((16*I)/2431)*Cos[c + d*x])/(a^2*d*(a^2 + I*a^2*Tan[c + d*x])^3) + (((
128*I)/12155)*Cos[c + d*x]^3)/(d*(a^8 + I*a^8*Tan[c + d*x]))
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3502

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

Rubi steps

$$\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^8}\,dx = \frac{i\cos(c+dx)}{17d(a+ia\tan(c+dx))^8} + \frac{9\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^7}\,dx}{17a}$$

$$= \frac{i\cos(c+dx)}{17d(a+ia\tan(c+dx))^8} + \frac{3i\cos(c+dx)}{85ad(a+ia\tan(c+dx))^7} + \frac{24\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^6}\,dx}{85a^2}$$

$$= \frac{i\cos(c+dx)}{17d(a+ia\tan(c+dx))^8} + \frac{3i\cos(c+dx)}{85ad(a+ia\tan(c+dx))^7} + \frac{24i\cos(c+dx)}{1105a^2d(a+ia\tan(c+dx)}$$

$$= \frac{i\cos(c+dx)}{17d(a+ia\tan(c+dx))^8} + \frac{3i\cos(c+dx)}{85ad(a+ia\tan(c+dx))^7} + \frac{24i\cos(c+dx)}{1105a^2d(a+ia\tan(c+dx)}$$

$$= \frac{i\cos(c+dx)}{17d(a+ia\tan(c+dx))^8} + \frac{3i\cos(c+dx)}{85ad(a+ia\tan(c+dx))^7} + \frac{24i\cos(c+dx)}{1105a^2d(a+ia\tan(c+dx)}$$

$$= \frac{i\cos(c+dx)}{17d(a+ia\tan(c+dx))^8} + \frac{3i\cos(c+dx)}{85ad(a+ia\tan(c+dx))^7} + \frac{24i\cos(c+dx)}{1105a^2d(a+ia\tan(c+dx)}$$

$$= \frac{i\cos(c+dx)}{17d(a+ia\tan(c+dx))^8} + \frac{3i\cos(c+dx)}{85ad(a+ia\tan(c+dx))^7} + \frac{24i\cos(c+dx)}{1105a^2d(a+ia\tan(c+dx)}$$

$$= \frac{i\cos(c+dx)}{17d(a+ia\tan(c+dx))^8} + \frac{3i\cos(c+dx)}{85ad(a+ia\tan(c+dx))^7} + \frac{24i\cos(c+dx)}{1105a^2d(a+ia\tan(c+dx)}$$

$$= \frac{192\sin(c+dx)}{12155a^8d} - \frac{64\sin^3(c+dx)}{12155a^8d} + \frac{i\cos(c+dx)}{17d(a+ia\tan(c+dx))^8} + \frac{3i\cos(c+dx}{85ad(a+ia\tan(c+}$$

Mathematica [A] time = 1.14, size = 139, normalized size = 0.51

$$-\frac{i\sec^8(c+dx)(-24310i\sin(c+dx) - 55692i\sin(3(c+dx)) - 56100i\sin(5(c+dx)) - 51051i\sin(7(c+dx)) + 64}{31}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((-1/3111680*I)*Sec[c + d*x]^8*(-194480*Cos[c + d*x] - 148512*Cos[3*(c + d*
x)] - 89760*Cos[5*(c + d*x)] - 58344*Cos[7*(c + d*x)] + 5720*Cos[9*(c + d*x
)] - (24310*I)*Sin[c + d*x] - (55692*I)*Sin[3*(c + d*x)] - (56100*I)*Sin[5*
(c + d*x)] - (51051*I)*Sin[7*(c + d*x)] + (6435*I)*Sin[9*(c + d*x)]))/(a^8*
d*(-I + Tan[c + d*x])^8)
```

fricas [A] time = 0.55, size = 118, normalized size = 0.44

$$\frac{\left(-12155i\,e^{(18i\,dx+18i\,c)} + 109395i\,e^{(16i\,dx+16i\,c)} + 145860i\,e^{(14i\,dx+14i\,c)} + 204204i\,e^{(12i\,dx+12i\,c)} + 218790i\,e^{(10i\,dx+10i\,c)} +\right.}{6223360\,a^8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/6223360*(-12155*I*e^(18*I*d*x + 18*I*c) + 109395*I*e^(16*I*d*x + 16*I*c)
+ 145860*I*e^(14*I*d*x + 14*I*c) + 204204*I*e^(12*I*d*x + 12*I*c) + 218790*
I*e^(10*I*d*x + 10*I*c) + 170170*I*e^(8*I*d*x + 8*I*c) + 92820*I*e^(6*I*d*x
```

```
 + 6*I*c) + 33660*I*e^(4*I*d*x + 4*I*c) + 7293*I*e^(2*I*d*x + 2*I*c) + 715*
I)*e^(-17*I*d*x - 17*I*c)/(a^8*d)
```

giac [**A**] time = 5.56, size = 249, normalized size = 0.92

$$\frac{\frac{12155}{a^8\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+i\right)}+\frac{6211205\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{16}-55791450i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{15}-303072770\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{14}+1091397450i\,\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{13}+2}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/3111680*(12155/(a^8*(tan(1/2*d*x + 1/2*c) + I)) + (6211205*tan(1/2*d*x +
1/2*c)^16 - 55791450*I*tan(1/2*d*x + 1/2*c)^15 - 303072770*tan(1/2*d*x + 1/
2*c)^14 + 1091397450*I*tan(1/2*d*x + 1/2*c)^13 + 2909561798*tan(1/2*d*x + 1
/2*c)^12 - 5901218466*I*tan(1/2*d*x + 1/2*c)^11 - 9405145178*tan(1/2*d*x +
1/2*c)^10 + 11877161010*I*tan(1/2*d*x + 1/2*c)^9 + 12017308160*tan(1/2*d*x
+ 1/2*c)^8 - 9710430158*I*tan(1/2*d*x + 1/2*c)^7 - 6263238566*tan(1/2*d*x +
 1/2*c)^6 + 3172666718*I*tan(1/2*d*x + 1/2*c)^5 + 1247921210*tan(1/2*d*x +
1/2*c)^4 - 365303990*I*tan(1/2*d*x + 1/2*c)^3 - 77883902*tan(1/2*d*x + 1/2*
c)^2 + 10498214*I*tan(1/2*d*x + 1/2*c) + 982907)/(a^8*(tan(1/2*d*x + 1/2*c)
 - I)^17))/d
```

maple [**A**] time = 0.47, size = 306, normalized size = 1.13

$$\frac{\frac{2}{512\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+512i}-\frac{5384i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{12}}-\frac{10241i}{2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{8}}+\frac{1793i}{128\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{2}}-\frac{128i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{16}}+\frac{13313i}{8\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{6}}-\frac{}{32(\tan}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)/(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 2/d/a^8*(1/512/(tan(1/2*d*x+1/2*c)+I)-2692*I/(tan(1/2*d*x+1/2*c)-I)^12-1024
1/4*I/(tan(1/2*d*x+1/2*c)-I)^8+1793/256*I/(tan(1/2*d*x+1/2*c)-I)^2-64*I/(ta
n(1/2*d*x+1/2*c)-I)^16+13313/16*I/(tan(1/2*d*x+1/2*c)-I)^6-7937/64*I/(tan(1
/2*d*x+1/2*c)-I)^4+784*I/(tan(1/2*d*x+1/2*c)-I)^14+19109/5*I/(tan(1/2*d*x+1
/2*c)-I)^10+128/17/(tan(1/2*d*x+1/2*c)-I)^17-1376/5/(tan(1/2*d*x+1/2*c)-I)^
15+21400/13/(tan(1/2*d*x+1/2*c)-I)^13-38954/11/(tan(1/2*d*x+1/2*c)-I)^11+68
47/2/(tan(1/2*d*x+1/2*c)-I)^9-12799/8/(tan(1/2*d*x+1/2*c)-I)^7+57083/160/(t
an(1/2*d*x+1/2*c)-I)^5-4351/128/(tan(1/2*d*x+1/2*c)-I)^3+511/512/(tan(1/2*d
*x+1/2*c)-I))
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**B**] time = 6.66, size = 262, normalized size = 0.97

$$\frac{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)\left(\frac{152329\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{128}-\frac{41121\,\sin\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)}{32}+\frac{41121\,\sin\left(\frac{5\,c}{2}+\frac{5\,d\,x}{2}\right)}{32}-\frac{96165\,\sin\left(\frac{7\,c}{2}+\frac{7\,d\,x}{2}\right)}{64}+\frac{96165\,\sin\left(\frac{9\,c}{2}+\frac{9\,d\,x}{2}\right)}{64}-\frac{55}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)/(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] (cos(c/2 + (d*x)/2)*((cos((3*c)/2 + (3*d*x)/2)*12155i)/16 - (cos((5*c)/2 +
(5*d*x)/2)*12155i)/16 + (cos((7*c)/2 + (7*d*x)/2)*21437i)/16 - (cos((9*c)/2
 + (9*d*x)/2)*21437i)/16 + (cos((11*c)/2 + (11*d*x)/2)*27047i)/16 - (cos((1
3*c)/2 + (13*d*x)/2)*27047i)/16 + (cos((15*c)/2 + (15*d*x)/2)*61387i)/32 -
(cos((17*c)/2 + (17*d*x)/2)*715i)/32 + (152329*sin(c/2 + (d*x)/2))/128 - (4
1121*sin((3*c)/2 + (3*d*x)/2))/32 + (41121*sin((5*c)/2 + (5*d*x)/2))/32 - (
96165*sin((7*c)/2 + (7*d*x)/2))/64 + (96165*sin((9*c)/2 + (9*d*x)/2))/64 -
(55095*sin((11*c)/2 + (11*d*x)/2))/32 + (55095*sin((13*c)/2 + (13*d*x)/2))/
32 - (491811*sin((15*c)/2 + (15*d*x)/2))/256 + (6435*sin((17*c)/2 + (17*d*x
)/2))/256)*2i)/(12155*a^8*d*(cos(c/2 + (d*x)/2) + sin(c/2 + (d*x)/2)*1i)^17
*(cos(c/2 + (d*x)/2)*1i + sin(c/2 + (d*x)/2)))
```

sympy [A] time = 1.02, size = 369, normalized size = 1.36

$$\begin{cases} \frac{\left(-14350091149820134393118720 0ia^{72}d^9e^{82ic}e^{idx}+129150820348381209538068480 0ia^{72}d^9e^{80ic}e^{-idx}+172201093797841612717424640 0ia^{72}d^9e^{78ic}e^{-\cdots}\right.}{\cdots} \\ \frac{x\left(e^{18ic}+9e^{16ic}+36e^{14ic}+84e^{12ic}+126e^{10ic}+126e^{8ic}+84e^{6ic}+36e^{4ic}+9e^{2ic}+1\right)e^{-17ic}}{512a^8} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Piecewise(((-14350091149820134393118720 0*I*a**72*d**9*exp(82*I*c)*exp(I*d*x
) + 12915082034838120953806848 00*I*a**72*d**9*exp(80*I*c)*exp(-I*d*x) + 172
20109379784161271742464 00*I*a**72*d**9*exp(78*I*c)*exp(-3*I*d*x) + 24108153
1316978257804394496 0*I*a**72*d**9*exp(76*I*c)*exp(-5*I*d*x) + 2583016406967
624190761369600*I*a**72*d**9*exp(74*I*c)*exp(-7*I*d*x) + 200901276097481881
5036620800*I*a**72*d**9*exp(72*I*c)*exp(-9*I*d*x) + 109582514234990117183 81
56800*I*a**72*d**9*exp(70*I*c)*exp(-11*I*d*x) + 39738713953348064473251840 0
*I*a**72*d**9*exp(68*I*c)*exp(-13*I*d*x) + 86100546898920806358712320*I*a**
72*d**9*exp(66*I*c)*exp(-15*I*d*x) + 8441230088129490819481600*I*a**72*d**9
*exp(64*I*c)*exp(-17*I*d*x))*exp(-81*I*c)/(734724666870790880927678464 00*a*
*80*d**10), Ne(73472466687079088092767846400*a**80*d**10*exp(81*I*c), 0)),
(x*(exp(18*I*c) + 9*exp(16*I*c) + 36*exp(14*I*c) + 84*exp(12*I*c) + 126*exp
(10*I*c) + 126*exp(8*I*c) + 84*exp(6*I*c) + 36*exp(4*I*c) + 9*exp(2*I*c) +
1)*exp(-17*I*c)/(512*a**8), True))
```

3.184 $\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx))^8}\,dx$

Optimal. Leaf size=301

$$\frac{32\sin^5(c+dx)}{4199a^8d}-\frac{320\sin^3(c+dx)}{12597a^8d}+\frac{160\sin(c+dx)}{4199a^8d}+\frac{64i\cos^5(c+dx)}{4199d\left(a^8+ia^8\tan(c+dx)\right)}+\frac{66i\cos^3(c+dx)}{4199a^3d(a+ia\tan(c+dx}$$

```
[Out] 160/4199*sin(d*x+c)/a^8/d-320/12597*sin(d*x+c)^3/a^8/d+32/4199*sin(d*x+c)^5
/a^8/d+1/19*I*cos(d*x+c)^3/d/(a+I*a*tan(d*x+c))^8+11/323*I*cos(d*x+c)^3/a/d
/(a+I*a*tan(d*x+c))^7+22/969*I*cos(d*x+c)^3/a^2/d/(a+I*a*tan(d*x+c))^6+66/4
199*I*cos(d*x+c)^3/a^3/d/(a+I*a*tan(d*x+c))^5+48/4199*I*cos(d*x+c)^3/d/(a^2
+I*a^2*tan(d*x+c))^4+112/12597*I*cos(d*x+c)^3/a^2/d/(a^2+I*a^2*tan(d*x+c))^
3+64/4199*I*cos(d*x+c)^5/d/(a^8+I*a^8*tan(d*x+c))
```

Rubi [A] time = 0.38, antiderivative size = 301, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3502, 3500, 2633}

$$\frac{32\sin^5(c+dx)}{4199a^8d}-\frac{320\sin^3(c+dx)}{12597a^8d}+\frac{160\sin(c+dx)}{4199a^8d}+\frac{64i\cos^5(c+dx)}{4199d\left(a^8+ia^8\tan(c+dx)\right)}+\frac{112i\cos^3(c+dx)}{12597a^2d\left(a^2+ia^2\tan(c+\right.}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] (160*Sin[c + d*x])/(4199*a^8*d) - (320*Sin[c + d*x]^3)/(12597*a^8*d) + (32*
Sin[c + d*x]^5)/(4199*a^8*d) + ((I/19)*Cos[c + d*x]^3)/(d*(a + I*a*Tan[c +
d*x])^8) + (((11*I)/323)*Cos[c + d*x]^3)/(a*d*(a + I*a*Tan[c + d*x])^7) + (
((22*I)/969)*Cos[c + d*x]^3)/(a^2*d*(a + I*a*Tan[c + d*x])^6) + (((66*I)/41
99)*Cos[c + d*x]^3)/(a^3*d*(a + I*a*Tan[c + d*x])^5) + (((48*I)/4199)*Cos[c
 + d*x]^3)/(d*(a^2 + I*a^2*Tan[c + d*x])^4) + (((112*I)/12597)*Cos[c + d*x]
^3)/(a^2*d*(a^2 + I*a^2*Tan[c + d*x])^3) + (((64*I)/4199)*Cos[c + d*x]^5)/(
d*(a^8 + I*a^8*Tan[c + d*x]))
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3502

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

Rubi steps

$$\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx))^8}\,dx = \frac{i\cos^3(c+dx)}{19d(a+ia\tan(c+dx))^8} + \frac{11\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx))^7}\,dx}{19a}$$

$$= \frac{i\cos^3(c+dx)}{19d(a+ia\tan(c+dx))^8} + \frac{11i\cos^3(c+dx)}{323ad(a+ia\tan(c+dx))^7} + \frac{110\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx))^6}\,dx}{323a^2}$$

$$= \frac{i\cos^3(c+dx)}{19d(a+ia\tan(c+dx))^8} + \frac{11i\cos^3(c+dx)}{323ad(a+ia\tan(c+dx))^7} + \frac{22i\cos^3(c+dx)}{969a^2d(a+ia\tan(c+dx)}$$

$$= \frac{i\cos^3(c+dx)}{19d(a+ia\tan(c+dx))^8} + \frac{11i\cos^3(c+dx)}{323ad(a+ia\tan(c+dx))^7} + \frac{22i\cos^3(c+dx)}{969a^2d(a+ia\tan(c+dx)}$$

$$= \frac{i\cos^3(c+dx)}{19d(a+ia\tan(c+dx))^8} + \frac{11i\cos^3(c+dx)}{323ad(a+ia\tan(c+dx))^7} + \frac{22i\cos^3(c+dx)}{969a^2d(a+ia\tan(c+dx)}$$

$$= \frac{i\cos^3(c+dx)}{19d(a+ia\tan(c+dx))^8} + \frac{11i\cos^3(c+dx)}{323ad(a+ia\tan(c+dx))^7} + \frac{22i\cos^3(c+dx)}{969a^2d(a+ia\tan(c+dx)}$$

$$= \frac{i\cos^3(c+dx)}{19d(a+ia\tan(c+dx))^8} + \frac{11i\cos^3(c+dx)}{323ad(a+ia\tan(c+dx))^7} + \frac{22i\cos^3(c+dx)}{969a^2d(a+ia\tan(c+dx)}$$

$$= \frac{i\cos^3(c+dx)}{19d(a+ia\tan(c+dx))^8} + \frac{11i\cos^3(c+dx)}{323ad(a+ia\tan(c+dx))^7} + \frac{22i\cos^3(c+dx)}{969a^2d(a+ia\tan(c+dx)}$$

$$= \frac{160\sin(c+dx)}{4199a^8d} - \frac{320\sin^3(c+dx)}{12597a^8d} + \frac{32\sin^5(c+dx)}{4199a^8d} + \frac{i\cos^3(c+dx)}{19d(a+ia\tan(c+dx))^8} +$$

Mathematica [A] time = 1.52, size = 161, normalized size = 0.53

$$-\frac{i\sec^8(c+dx)(-92378i\sin(c+dx) - 226746i\sin(3(c+dx)) - 266475i\sin(5(c+dx)) - 323323i\sin(7(c+dx))}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3/(a + I*a*Tan[c + d*x])^8,x]
```

```
[Out] ((-1/12899328*I)*Sec[c + d*x]^8*(-739024*Cos[c + d*x] - 604656*Cos[3*(c + d
*x)] - 426360*Cos[5*(c + d*x)] - 369512*Cos[7*(c + d*x)] + 65208*Cos[9*(c +
 d*x)] + 1768*Cos[11*(c + d*x)] - (92378*I)*Sin[c + d*x] - (226746*I)*Sin[3
*(c + d*x)] - (266475*I)*Sin[5*(c + d*x)] - (323323*I)*Sin[7*(c + d*x)] + (
73359*I)*Sin[9*(c + d*x)] + (2431*I)*Sin[11*(c + d*x)]))/(a^8*d*(-I + Tan[c
 + d*x])^8)
```

fricas [A] time = 0.57, size = 140, normalized size = 0.47

$$\frac{\left(-4199ie^{(22idx+22ic)} - 138567ie^{(20idx+20ic)} + 692835ie^{(18idx+18ic)} + 692835ie^{(16idx+16ic)} + 831402ie^{(14idx+14ic)} +\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^8,x, algorithm="fricas")
```

```
[Out] 1/25798656*(-4199*I*e^(22*I*d*x + 22*I*c) - 138567*I*e^(20*I*d*x + 20*I*c)
+ 692835*I*e^(18*I*d*x + 18*I*c) + 692835*I*e^(16*I*d*x + 16*I*c) + 831402*
```

```
I*e^(14*I*d*x + 14*I*c) + 831402*I*e^(12*I*d*x + 12*I*c) + 646646*I*e^(10*I
*d*x + 10*I*c) + 377910*I*e^(8*I*d*x + 8*I*c) + 159885*I*e^(6*I*d*x + 6*I*c
) + 46189*I*e^(4*I*d*x + 4*I*c) + 8151*I*e^(2*I*d*x + 2*I*c) + 663*I)*e^(-1
9*I*d*x - 19*I*c)/(a^8*d)
```

giac [A] time = 5.93, size = 301, normalized size = 1.00

$$\frac{\frac{4199\left(18\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^{2}+33i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-17\right)}{a^{8}\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+i\right)^{3}}+\frac{12823746\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^{18}-140368371i\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^{17}-879644311\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^{16}+3\cdots}{\cdots}}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^8,x, algorithm="giac")
```

```
[Out] 1/6449664*(4199*(18*tan(1/2*d*x + 1/2*c)^2 + 33*I*tan(1/2*d*x + 1/2*c) - 17
)/(a^8*(tan(1/2*d*x + 1/2*c) + I)^3) + (12823746*tan(1/2*d*x + 1/2*c)^18 -
140368371*I*tan(1/2*d*x + 1/2*c)^17 - 879644311*tan(1/2*d*x + 1/2*c)^16 + 3
693272440*I*tan(1/2*d*x + 1/2*c)^15 + 11467502592*tan(1/2*d*x + 1/2*c)^14 -
 27403194676*I*tan(1/2*d*x + 1/2*c)^13 - 51919375300*tan(1/2*d*x + 1/2*c)^1
2 + 79183835016*I*tan(1/2*d*x + 1/2*c)^11 + 98304418212*tan(1/2*d*x + 1/2*c
)^10 - 99750226290*I*tan(1/2*d*x + 1/2*c)^9 - 82860874122*tan(1/2*d*x + 1/2
*c)^8 + 56110430792*I*tan(1/2*d*x + 1/2*c)^7 + 30766700912*tan(1/2*d*x + 1/
2*c)^6 - 13462452660*I*tan(1/2*d*x + 1/2*c)^5 - 4616712644*tan(1/2*d*x + 1/
2*c)^4 + 1197851960*I*tan(1/2*d*x + 1/2*c)^3 + 226248618*tan(1/2*d*x + 1/2*
c)^2 - 27911475*I*tan(1/2*d*x + 1/2*c) - 2143959)/(a^8*(tan(1/2*d*x + 1/2*c
) - I)^19))/d
```

maple [A] time = 0.48, size = 372, normalized size = 1.24

$$\frac{\frac{128i}{\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{18}}-\frac{1}{768\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)^{3}}+\frac{3}{256\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)+i\right)}-\frac{32525i}{4\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{8}}+\frac{32417i}{2\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{10}}+\frac{7181i}{512\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-i\right)^{2}}-\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^8,x)
```

```
[Out] 2/d/a^8*(64*I/(tan(1/2*d*x+1/2*c)-I)^18-1/1536/(tan(1/2*d*x+1/2*c)+I)^3+3/5
12/(tan(1/2*d*x+1/2*c)+I)-32525/8*I/(tan(1/2*d*x+1/2*c)-I)^8+32417/4*I/(tan
(1/2*d*x+1/2*c)-I)^10+7181/1024*I/(tan(1/2*d*x+1/2*c)-I)^2-1/1024*I/(tan(1/
2*d*x+1/2*c)+I)^2-992*I/(tan(1/2*d*x+1/2*c)-I)^16-25468/3*I/(tan(1/2*d*x+1/
2*c)-I)^12-2177/16*I/(tan(1/2*d*x+1/2*c)-I)^4+4428*I/(tan(1/2*d*x+1/2*c)-I)
^14+204605/192*I/(tan(1/2*d*x+1/2*c)-I)^6-128/19/(tan(1/2*d*x+1/2*c)-I)^19+
5248/17/(tan(1/2*d*x+1/2*c)-I)^17-7096/3/(tan(1/2*d*x+1/2*c)-I)^15+87508/13
/(tan(1/2*d*x+1/2*c)-I)^13-18011/2/(tan(1/2*d*x+1/2*c)-I)^11+6215/(tan(1/2*
d*x+1/2*c)-I)^9-72425/32/(tan(1/2*d*x+1/2*c)-I)^7+26871/64/(tan(1/2*d*x+1/2
*c)-I)^5-54229/1536/(tan(1/2*d*x+1/2*c)-I)^3+509/512/(tan(1/2*d*x+1/2*c)-I)
)
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^8,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 9.52, size = 308, normalized size = 1.02

$$-\frac{2\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)\left(\frac{46189\cos\left(\frac{5\,c}{2}+\frac{5\,d\,x}{2}\right)}{64}-\frac{46189\cos\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)}{64}-\frac{20995\cos\left(\frac{7\,c}{2}+\frac{7\,d\,x}{2}\right)}{16}+\frac{20995\cos\left(\frac{9\,c}{2}+\frac{9\,d\,x}{2}\right)}{16}-\frac{221255\cos\left(\frac{11\,c}{2}+\frac{11\,d\,x}{2}\right)}{128}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3/(a + a*tan(c + d*x)*1i)^8,x)
```

```
[Out] -(2*cos(c/2 + (d*x)/2)*((46189*cos((5*c)/2 + (5*d*x)/2))/64 - (46189*cos((3
*c)/2 + (3*d*x)/2))/64 - (20995*cos((7*c)/2 + (7*d*x)/2))/16 + (20995*cos((
9*c)/2 + (9*d*x)/2))/16 - (221255*cos((11*c)/2 + (11*d*x)/2))/128 + (221255
*cos((13*c)/2 + (13*d*x)/2))/128 - (66861*cos((15*c)/2 + (15*d*x)/2))/32 +
(2093*cos((17*c)/2 + (17*d*x)/2))/32 - (221*cos((19*c)/2 + (19*d*x)/2))/128
 + (221*cos((21*c)/2 + (21*d*x)/2))/128 + (sin(c/2 + (d*x)/2)*309861i)/256
- (sin((3*c)/2 + (3*d*x)/2)*665911i)/512 + (sin((5*c)/2 + (5*d*x)/2)*665911
i)/512 - (sin((7*c)/2 + (7*d*x)/2)*194821i)/128 + (sin((9*c)/2 + (9*d*x)/2)
*194821i)/128 - (sin((11*c)/2 + (11*d*x)/2)*1825043i)/1024 + (sin((13*c)/2
+ (13*d*x)/2)*1825043i)/1024 - (sin((15*c)/2 + (15*d*x)/2)*1074183i)/512 +
(sin((17*c)/2 + (17*d*x)/2)*37895i)/512 - (sin((19*c)/2 + (19*d*x)/2)*2431i
)/1024 + (sin((21*c)/2 + (21*d*x)/2)*2431i)/1024))/(12597*a^8*d*(cos(c/2 +
(d*x)/2) + sin(c/2 + (d*x)/2)*1i)^19*(cos(c/2 + (d*x)/2)*1i + sin(c/2 + (d*
x)/2))^3)
```

sympy [A] time = 1.30, size = 437, normalized size = 1.45

$$\begin{cases} \frac{\left(-627910689858846946911347157688181273395 2 i a^{88} d^{11} e^{103 i c} e^{3 i d x} - 207210527653419492480744562037099820220416 i a^{88} d^{11} e^{101 i c} e^{i d x} + 10360526\right.}{} \\ \frac{x\left(e^{22 i c}+11 e^{20 i c}+55 e^{18 i c}+165 e^{16 i c}+330 e^{14 i c}+462 e^{12 i c}+462 e^{10 i c}+330 e^{8 i c}+165 e^{6 i c}+55 e^{4 i c}+11 e^{2 i c}+1\right) e^{-19 i c}}{2048 a^{8}} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3/(a+I*a*tan(d*x+c))**8,x)
```

```
[Out] Piecewise(((-627910689858846946911347157688181273395 2*I*a**88*d**11*exp(103
*I*c)*exp(3*I*d*x) - 207210527653419492480744562037099820220416*I*a**88*d**
11*exp(101*I*c)*exp(I*d*x) + 1036052638267097462403722810185499101102080*I*
a**88*d**11*exp(99*I*c)*exp(-I*d*x) + 1036052638267097462403722810185499101
102080*I*a**88*d**11*exp(97*I*c)*exp(-3*I*d*x) + 12432631659205169548844673
72222598921322496*I*a**88*d**11*exp(95*I*c)*exp(-5*I*d*x) + 124326316592051
6954884467372222598921322496*I*a**88*d**11*exp(93*I*c)*exp(-7*I*d*x) + 9669
824623826242982434746228397991610286 08*I*a**88*d**11*exp(91*I*c)*exp(-9*I*d
*x) + 565119620872962252220212441919363146055680*I*a**88*d**11*exp(89*I*c)*
exp(-11*I*d*x) + 239089070369330183631628340812038254100480*I*a**88*d**11*e
xp(87*I*c)*exp(-13*I*d*x) + 69070175884473164160248187345699940073472*I*a**
88*d**11*exp(85*I*c)*exp(-15*I*d*x) + 121888545678482054400437977668882247 1
8848*I*a**88*d**11*exp(83*I*c)*exp(-17*I*d*x) + 991437931356074126702127091
086602010624*I*a**88*d**11*exp(81*I*c)*exp(-19*I*d*x))*exp(-100*I*c)/(38578
8327849275564182331693683618574374 01088*a**96*d**12), Ne(385788327849275564
18233169368361857437401088*a**96*d**12*exp(100*I*c), 0)), (x*(exp(22*I*c) +
 11*exp(20*I*c) + 55*exp(18*I*c) + 165*exp(16*I*c) + 330*exp(14*I*c) + 462*
exp(12*I*c) + 462*exp(10*I*c) + 330*exp(8*I*c) + 165*exp(6*I*c) + 55*exp(4*
I*c) + 11*exp(2*I*c) + 1)*exp(-19*I*c)/(2048*a**8), True))
```

3.185 $\int (e\sec(c+dx))^{7/2}(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=123

$$-\frac{6ae^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{6ae^3\sin(c+dx)\sqrt{e\sec(c+dx)}}{5d}+\frac{2ia(e\sec(c+dx))^{7/2}}{7d}+\frac{2ae\sin(c+dx)(e\sec}{5d}$$

```
[Out] 2/7*I*a*(e*sec(d*x+c))^(7/2)/d+2/5*a*e*(e*sec(d*x+c))^(5/2)*sin(d*x+c)/d-6/
5*a*e^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d
*x+1/2*c),2^(1/2))/d/cos(d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)+6/5*a*e^3*sin(d*
x+c)*(e*sec(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.09, antiderivative size = 123, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3486, 3768, 3771, 2639}

$$\frac{6ae^3\sin(c+dx)\sqrt{e\sec(c+dx)}}{5d}-\frac{6ae^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{2ia(e\sec(c+dx))^{7/2}}{7d}+\frac{2ae\sin(c+dx)(e\sec(}{5d}$$

Antiderivative was successfully verified.

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

```
[Out] (-6*a*e^4*EllipticE[(c + d*x)/2, 2])/(5*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c +
 d*x]]) + (((2*I)/7)*a*(e*Sec[c + d*x])^(7/2))/d + (6*a*e^3*Sqrt[e*Sec[c +
d*x]]*Sin[c + d*x])/(5*d) + (2*a*e*(e*Sec[c + d*x])^(5/2)*Sin[c + d*x])/(5*
d)
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

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

Rule 3768

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int (e\sec(c+dx))^{7/2}(a+ia\tan(c+dx))\,dx = \frac{2ia(e\sec(c+dx))^{7/2}}{7d} + a\int (e\sec(c+dx))^{7/2}\,dx$$
$$= \frac{2ia(e\sec(c+dx))^{7/2}}{7d} + \frac{2ae(e\sec(c+dx))^{5/2}\sin(c+dx)}{5d} + \frac{1}{5}\left(3ae^2\right)$$
$$= \frac{2ia(e\sec(c+dx))^{7/2}}{7d} + \frac{6ae^3\sqrt{e\sec(c+dx)}\sin(c+dx)}{5d} + \frac{2ae(e\sec(c}{}$$
$$= \frac{2ia(e\sec(c+dx))^{7/2}}{7d} + \frac{6ae^3\sqrt{e\sec(c+dx)}\sin(c+dx)}{5d} + \frac{2ae(e\sec(c}{}$$
$$= -\frac{6ae^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} + \frac{2ia(e\sec(c+dx))^{7/2}}{7d} + \frac{6ae^3\sqrt{e\,s}}{}$$

Mathematica [C] time = 2.21, size = 156, normalized size = 1.27

$$\frac{aee^{-idx}(\cos(dx)-i\sin(dx))(e\sec(c+dx))^{5/2}(\cos(c+3dx)+i\sin(c+3dx))\left(7ie^{-2i(c+dx)}\left(1+e^{2i(c+dx)}\right)^{5/2}{}_2F_1\left(\frac{1}{2},\frac{3}{4}\right.\right.}{70d}$$

Antiderivative was successfully verified.

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

```
[Out] (a*e*(e*Sec[c + d*x])^(5/2)*(Cos[d*x] - I*Sin[d*x])*(Cos[c + 3*d*x] + I*Sin
[c + 3*d*x])*(-36*I - (28*I)*Cos[2*(c + d*x)] + ((7*I)*(1 + E^((2*I)*(c + d
*x)))^(5/2)*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x))])/E^((2*I
)*(c + d*x)) + 7*Sec[c + d*x]*Sin[3*(c + d*x)] + 27*Tan[c + d*x]))/(70*d*E^
(I*d*x))
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-42i\,ae^3e^{(7i\,dx+7i\,c)} - 154i\,ae^3e^{(5i\,dx+5i\,c)} - 46i\,ae^3e^{(3i\,dx+3i\,c)} - 14i\,ae^3e^{(i\,dx+i\,c)}\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)} + 35\left(de^{(6}\right.}{35\left(de^{(6i\,dx+6i\,c)} + 3\,de^{(4i\,dx+4i\,c)} + 3\,de^{(2i}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/35*(sqrt(2)*(-42*I*a*e^3*e^(7*I*d*x + 7*I*c) - 154*I*a*e^3*e^(5*I*d*x + 5
*I*c) - 46*I*a*e^3*e^(3*I*d*x + 3*I*c) - 14*I*a*e^3*e^(I*d*x + I*c))*sqrt(e
/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 35*(d*e^(6*I*d*x + 6*
I*c) + 3*d*e^(4*I*d*x + 4*I*c) + 3*d*e^(2*I*d*x + 2*I*c) + d)*integral(3/5*
I*sqrt(2)*a*e^3*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/d
, x))/(d*e^(6*I*d*x + 6*I*c) + 3*d*e^(4*I*d*x + 4*I*c) + 3*d*e^(2*I*d*x + 2
*I*c) + d)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [B] time = 0.94, size = 365, normalized size = 2.97

$$-\frac{2a\left(1+\cos\left(dx+c\right)\right)^{2}\left(-1+\cos\left(dx+c\right)\right)^{2}\left(21i\sin\left(dx+c\right)\left(\cos^{4}\left(dx+c\right)\right)\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \mathrm{Ellipti}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -2/35*a/d*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(21*I*sin(d*x+c)*cos(d*x+c)^4*
(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+
cos(d*x+c))/sin(d*x+c),I)-21*I*sin(d*x+c)*cos(d*x+c)^4*(1/(1+cos(d*x+c)))^(
1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+
c),I)+21*I*sin(d*x+c)*cos(d*x+c)^3*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+
cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-21*I*sin(d*x+c
)*cos(d*x+c)^3*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*E
llipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)+21*cos(d*x+c)^4-14*cos(d*x+c)^3-5*
I*sin(d*x+c)-7*cos(d*x+c))*(e/cos(d*x+c))^(7/2)/sin(d*x+c)^5
```

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

$$\int \left(e\sec\left(dx+c\right)\right)^{\frac{7}{2}}\left(i\,a\tan\left(dx+c\right)+a\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(\frac{e}{\cos\left(c+d\,x\right)}\right)}^{7/2}\,\left(a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}\right)\,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(7/2)*(a + a*tan(c + d*x)*1i),x)
```

```
[Out] int((e/cos(c + d*x))^(7/2)*(a + a*tan(c + d*x)*1i), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

3.186 $\int (e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=94

$$\frac{2ae^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3d}+\frac{2ia(e\sec(c+dx))^{5/2}}{5d}+\frac{2ae\sin(c+dx)(e\sec(c+dx))^{3/2}}{3d}$$

```
[Out] 2/5*I*a*(e*sec(d*x+c))^(5/2)/d+2/3*a*e*(e*sec(d*x+c))^(3/2)*sin(d*x+c)/d+2/
3*a*e^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d
*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.06, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3486, 3768, 3771, 2641}

$$\frac{2ae^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3d}+\frac{2ia(e\sec(c+dx))^{5/2}}{5d}+\frac{2ae\sin(c+dx)(e\sec(c+dx))^{3/2}}{3d}$$

Antiderivative was successfully verified.

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

```
[Out] (2*a*e^2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])
/(3*d) + (((2*I)/5)*a*(e*Sec[c + d*x])^(5/2))/d + (2*a*e*(e*Sec[c + d*x])^(
3/2)*Sin[c + d*x])/(3*d)
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

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

Rule 3768

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int (e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))\,dx = \frac{2ia(e\sec(c+dx))^{5/2}}{5d} + a\int (e\sec(c+dx))^{5/2}\,dx$$
$$= \frac{2ia(e\sec(c+dx))^{5/2}}{5d} + \frac{2ae(e\sec(c+dx))^{3/2}\sin(c+dx)}{3d} + \frac{1}{3}\left(ae^2\right.$$
$$= \frac{2ia(e\sec(c+dx))^{5/2}}{5d} + \frac{2ae(e\sec(c+dx))^{3/2}\sin(c+dx)}{3d} + \frac{1}{3}\left(ae^2\right.$$
$$= \frac{2ae^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3d} + \frac{2ia(e\sec(c+}{5d}$$

Mathematica [A] time = 0.55, size = 57, normalized size = 0.61

$$\frac{a(e\sec(c+dx))^{5/2}\left(5\sin(2(c+dx))+10\cos^{\frac{5}{2}}(c+dx)F\left(\frac{1}{2}(c+dx)\middle|2\right)+6i\right)}{15d}$$

Antiderivative was successfully verified.

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

```
[Out] (a*(e*Sec[c + d*x])^(5/2)*(6*I + 10*Cos[c + d*x]^(5/2)*EllipticF[(c + d*x)/
2, 2] + 5*Sin[2*(c + d*x)]))/(15*d)
```

fricas [F] time = 0.79, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-10i\,ae^2e^{(4i\,dx+4i\,c)}+24i\,ae^2e^{(2i\,dx+2i\,c)}+10i\,ae^2\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+15\left(de^{(4i\,dx+4i\,c)}+2\,de^{(2i\,dx+2i\,c)}+\right.}{15\left(de^{(4i\,dx+4i\,c)}+2\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/15*(sqrt(2)*(-10*I*a*e^2*e^(4*I*d*x + 4*I*c) + 24*I*a*e^2*e^(2*I*d*x + 2*
I*c) + 10*I*a*e^2)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c
) + 15*(d*e^(4*I*d*x + 4*I*c) + 2*d*e^(2*I*d*x + 2*I*c) + d)*integral(-1/3*
I*sqrt(2)*a*e^2*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/
d, x))/(d*e^(4*I*d*x + 4*I*c) + 2*d*e^(2*I*d*x + 2*I*c) + d)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [A] time = 0.83, size = 192, normalized size = 2.04

$$\frac{2a\,(1+\cos(dx+c))^2\,(-1+\cos(dx+c))^2\left(5i\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\left(\cos^3(dx+c)\right)\mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c}{\sin(dx+c)}\right.\right.}{1}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/15*a/d*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(5*I*(1/(1+cos(d*x+c)))^(1/2)*(
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^3*EllipticF(I*(-1+cos(d*x+c))/s
in(d*x+c),I)+5*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*cos(d*x+c)^2*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)+5*cos(d*x+c)*sin(d*
x+c)+3*I)*(e/cos(d*x+c))^(5/2)/sin(d*x+c)^4
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(\frac{e}{\cos(c+d\,x)}\right)^{5/2} (a+a\tan(c+d\,x)\,1\mathrm{i})\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(5/2)*(a + a*tan(c + d*x)*1i),x)
```

```
[Out] int((e/cos(c + d*x))^(5/2)*(a + a*tan(c + d*x)*1i), x)
```

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

$$ia\left(\int \left(-i(e\sec(c+dx))^{\frac{5}{2}}\right) dx + \int (e\sec(c+dx))^{\frac{5}{2}}\tan(c+dx)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.187 $\int (e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=90

$$-\frac{2ae^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{2ia(e\sec(c+dx))^{3/2}}{3d}+\frac{2ae\sin(c+dx)\sqrt{e\sec(c+dx)}}{d}$$

```
[Out] 2/3*I*a*(e*sec(d*x+c))^(3/2)/d-2*a*e^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2
*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/d/cos(d*x+c)^(1/2)/(e*sec
(d*x+c))^(1/2)+2*a*e*sin(d*x+c)*(e*sec(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.06, antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3486, 3768, 3771, 2639}

$$-\frac{2ae^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{2ia(e\sec(c+dx))^{3/2}}{3d}+\frac{2ae\sin(c+dx)\sqrt{e\sec(c+dx)}}{d}$$

Antiderivative was successfully verified.

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

```
[Out] (-2*a*e^2*EllipticE[(c + d*x)/2, 2])/(d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c + d
*x]]) + (((2*I)/3)*a*(e*Sec[c + d*x])^(3/2))/d + (2*a*e*Sqrt[e*Sec[c + d*x]
]*Sin[c + d*x])/d
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

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

Rule 3768

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int (e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))\,dx = \frac{2ia(e\sec(c+dx))^{3/2}}{3d} + a\int (e\sec(c+dx))^{3/2}\,dx$$
$$= \frac{2ia(e\sec(c+dx))^{3/2}}{3d} + \frac{2ae\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{d} - \left(ae^2\right)\int \frac{}{\sqrt{e}}$$
$$= \frac{2ia(e\sec(c+dx))^{3/2}}{3d} + \frac{2ae\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{d} - \frac{\left(ae^2\right)\int \sqrt{}}{\sqrt{\cos(c+d}}$$
$$= -\frac{2ae^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} + \frac{2ia(e\sec(c+dx))^{3/2}}{3d} + \frac{2ae\sqrt{e\sec}}{}$$

Mathematica [C] time = 0.85, size = 102, normalized size = 1.13

$$\frac{2aee^{-2idx}\sqrt{e\sec(c+dx)}\left(i\sqrt{1+e^{2i(c+dx)}}\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)+\tan(c+dx)-2i\right)(\cos(c+3dx)+i\sin(c+3dx))}{3d}$$

Antiderivative was successfully verified.

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

```
[Out] (2*a*e*Sqrt[e*Sec[c + d*x]]*(Cos[c + 3*d*x] + I*Sin[c + 3*d*x])*(-2*I + I*S
qrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c
+ d*x))] + Tan[c + d*x]))/(3*d*E^((2*I)*d*x))
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-6i\,aee^{(3i\,dx+3i\,c)} - 2i\,aee^{(i\,dx+i\,c)}\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)} + 3\left(de^{(2i\,dx+2i\,c)}+d\right)\mathrm{integral}\left(\frac{i\sqrt{2}\,ae\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx\right.}}{d}\right.}{3\left(de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*(sqrt(2)*(-6*I*a*e*e^(3*I*d*x + 3*I*c) - 2*I*a*e*e^(I*d*x + I*c))*sqrt(
e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 3*(d*e^(2*I*d*x + 2*
I*c) + d)*integral(I*sqrt(2)*a*e*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I
*d*x + 1/2*I*c)/d, x))/(d*e^(2*I*d*x + 2*I*c) + d)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [B] time = 0.82, size = 351, normalized size = 3.90

$$2a(1+\cos(dx+c))^2(-1+\cos(dx+c))^2\left(3i\sin(dx+c)\left(\cos^2(dx+c)\right)\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \mathrm{EllipticE}\left(\frac{i(}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/3*a/d*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(3*I*sin(d*x+c)*cos(d*x+c)^2*(1/
(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos
(d*x+c))/sin(d*x+c),I)-3*I*sin(d*x+c)*cos(d*x+c)^2*(1/(1+cos(d*x+c)))^(1/2)
*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I
)+3*I*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(d*x+c)-3*I*cos(d*x+c)*(1/(1+
cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*
x+c))/sin(d*x+c),I)*sin(d*x+c)+I*sin(d*x+c)-3*cos(d*x+c)^2+3*cos(d*x+c))*(e
/cos(d*x+c))^(3/2)/sin(d*x+c)^5
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(\frac{e}{\cos(c+d\,x)}\right)^{3/2} (a+a\tan(c+d\,x)\,1\mathrm{i})\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i),x)
```

```
[Out] int((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i), x)
```

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

$$ia\left(\int \left(-i\,(e\sec(c+dx))^{\frac{3}{2}}\right)dx+\int (e\sec(c+dx))^{\frac{3}{2}}\tan(c+dx)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.188 $\int \sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=60

$$\frac{2a\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{d}+\frac{2ia\sqrt{e\sec(c+dx)}}{d}$$

```
[Out] 2*I*a*(e*sec(d*x+c))^(1/2)/d+2*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1
/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(d*x+c))
^(1/2)/d
```

Rubi [A] time = 0.04, antiderivative size = 60, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.115, Rules used = {3486, 3771, 2641}

$$\frac{2a\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{d}+\frac{2ia\sqrt{e\sec(c+dx)}}{d}$$

Antiderivative was successfully verified.

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

```
[Out] ((2*I)*a*Sqrt[e*Sec[c + d*x]])/d + (2*a*Sqrt[Cos[c + d*x]]*EllipticF[(c + d
*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/d
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\begin{aligned}
\int \sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))\,dx &= \frac{2ia\sqrt{e\sec(c+dx)}}{d}+a\int \sqrt{e\sec(c+dx)}\,dx\\
&= \frac{2ia\sqrt{e\sec(c+dx)}}{d}+\left(a\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx}}\\
&= \frac{2ia\sqrt{e\sec(c+dx)}}{d}+\frac{2a\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx}}{d}
\end{aligned}$$

Mathematica [A] time = 0.26, size = 44, normalized size = 0.73

$$\frac{2a\sqrt{e\sec(c+dx)}\left(\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)+i\right)}{d}$$

Antiderivative was successfully verified.

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

```
[Out] (2*a*(I + Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])*Sqrt[e*Sec[c + d*x]
])/d
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(sqrt(e*sec(d*x + c))*(I*a*tan(d*x + c) + a), x)
```

maple [B] time = 0.89, size = 164, normalized size = 2.73

$$\frac{2ia\sqrt{\frac{e}{\cos(dx+c)}}\left(1+\cos\left(dx+c\right)\right)^{2}\left(-1+\cos\left(dx+c\right)\right)^{2}\left(\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\cos\left(dx+c\right)\mathrm{EllipticF}\left(\frac{i(-1+}{\sin}\right.\right.}{d\sin\left(dx+c\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] integrate(sqrt(e*sec(d*x + c))*(I*a*tan(d*x + c) + a), x)
```

mupad [B] time = 3.78, size = 40, normalized size = 0.67

$$\frac{2\,a\,\left(\sqrt{\cos\left(c+d\,x\right)}\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)+1{}\mathrm{i}\right)\,\sqrt{\frac{e}{\cos(c+d\,x)}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (2*a*(cos(c + d*x)^(1/2)*ellipticF(c/2 + (d*x)/2, 2) + 1i)*(e/cos(c + d*x))
^(1/2))/d
```

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

$$ia\left(\int\left(-i\sqrt{e\sec\left(c+dx\right)}\right)dx+\int\sqrt{e\sec\left(c+dx\right)}\tan\left(c+dx\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] I*a*(Integral(-I*sqrt(e*sec(c + d*x)), x) + Integral(sqrt(e*sec(c + d*x))*t
an(c + d*x), x))
```

3.189 $\int \frac{a+ia\tan(c+dx)}{\sqrt{e\sec(c+dx)}}\,dx$

Optimal. Leaf size=60

$$\frac{2aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{2ia}{d\sqrt{e\sec(c+dx)}}$$

```
[Out] -2*I*a/d/(e*sec(d*x+c))^(1/2)+2*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+
1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/d/cos(d*x+c)^(1/2)/(e*sec(d*x+
c))^(1/2)
```

Rubi [A] time = 0.05, antiderivative size = 60, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.115, Rules used = {3486, 3771, 2639}

$$\frac{2aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{2ia}{d\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

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

```
[Out] ((-2*I)*a)/(d*Sqrt[e*Sec[c + d*x]]) + (2*a*EllipticE[(c + d*x)/2, 2])/(d*Sq
rt[Cos[c + d*x]]*Sqrt[e*Sec[c + d*x]])
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\begin{aligned}\int \frac{a+ia\tan(c+dx)}{\sqrt{e\sec(c+dx)}}\,dx &= -\frac{2ia}{d\sqrt{e\sec(c+dx)}}+a\int \frac{1}{\sqrt{e\sec(c+dx)}}\,dx\\ &= -\frac{2ia}{d\sqrt{e\sec(c+dx)}}+\frac{a\int \sqrt{\cos(c+dx)}\,dx}{\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}\\ &= -\frac{2ia}{d\sqrt{e\sec(c+dx)}}+\frac{2aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}\end{aligned}$$

Mathematica [C] time = 0.36, size = 73, normalized size = 1.22

$$-\frac{4iae^{2i(c+dx)}\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)}{3d\sqrt{1+e^{2i(c+dx)}}\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

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

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

fricas [F] time = 0.68, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-2i\,ae^{(2i\,dx+2i\,c)}-2i\,a\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+\left(dee^{(i\,dx+i\,c)}-de\right)\mathrm{integral}\left(\frac{\sqrt{2}\left(-i\,ae^{(2i\,dx+2i\,c)}-2i\,ae^{(i\,dx+i\,c)}-i\,a\right)\sqrt{\frac{e}{e^{(2i\,dx}\cdots}}}{dee^{(3i\,dx+3i\,c)}-2\,dee^{(2i\,dx+2i\,c)}+de\cdots}\right.}{dee^{(i\,dx+i\,c)}-de}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int \frac{i\,a\tan\left(dx+c\right)+a}{\sqrt{e\sec\left(dx+c\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [B] time = 0.91, size = 910, normalized size = 15.17

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/2*a/d*(-1+cos(d*x+c))*(4*I*sin(d*x+c)*cos(d*x+c)^2*EllipticF(I*(-1+cos(d
*x+c))/sin(d*x+c),I)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)*(1/(1+cos(d*x+c))
)^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-4*I*sin(d*x+c)*cos(d*x+c)^2*Ellip
ticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)*(
1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+8*I*sin(d*x+c)*co
s(d*x+c)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*(-cos(d*x+c)/(1+cos(d*x+
c))^2)^(1/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-8*I
*sin(d*x+c)*cos(d*x+c)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*(-cos(d*x+
c)/(1+cos(d*x+c))^2)^(1/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)+4*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(
-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),
I)*sin(d*x+c)-4*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2
)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+
```

```
c),I)*sin(d*x+c)-4*I*sin(d*x+c)*cos(d*x+c)^2*(-cos(d*x+c)/(1+cos(d*x+c))^2)
^(1/2)+I*ln(-2*(2*cos(d*x+c)^2*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)-cos(d*x
+c)^2+2*cos(d*x+c)-2*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)-1)/sin(d*x+c)^2)*
cos(d*x+c)*sin(d*x+c)-I*cos(d*x+c)*ln(-(2*cos(d*x+c)^2*(-cos(d*x+c)/(1+cos(
d*x+c))^2)^(1/2)-cos(d*x+c)^2+2*cos(d*x+c)-2*(-cos(d*x+c)/(1+cos(d*x+c))^2)
^(1/2)-1)/sin(d*x+c)^2)*sin(d*x+c)-4*I*sin(d*x+c)*cos(d*x+c)*(-cos(d*x+c)/(
1+cos(d*x+c))^2)^(1/2)-4*cos(d*x+c)^3*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)+
4*cos(d*x+c)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2))/sin(d*x+c)^3/cos(d*x+c)/
(e/cos(d*x+c))^(1/2)/(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)
```

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

$$\int \frac{i\,a\tan\left(dx+c\right)+a}{\sqrt{e\sec\left(dx+c\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

$$\int \frac{a+a\tan\left(c+d\,x\right)\,1{}\mathrm{i}}{\sqrt{\frac{e}{\cos\left(c+d\,x\right)}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((a + a*tan(c + d*x)*1i)/(e/cos(c + d*x))^(1/2), x)
```

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

$$ia\left(\int\left(-\frac{i}{\sqrt{e\sec\left(c+dx\right)}}\right)dx+\int\frac{\tan\left(c+dx\right)}{\sqrt{e\sec\left(c+dx\right)}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] I*a*(Integral(-I/sqrt(e*sec(c + d*x)), x) + Integral(tan(c + d*x)/sqrt(e*se
c(c + d*x)), x))
```

3.190 $\int \frac{a+ia\tan(c+dx)}{(e\sec(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=96

$$\frac{2a\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3de^2}-\frac{2ia}{3d(e\sec(c+dx))^{3/2}}+\frac{2a\sin(c+dx)}{3de\sqrt{e\sec(c+dx)}}$$

```
[Out] -2/3*I*a/d/(e*sec(d*x+c))^(3/2)+2/3*a*sin(d*x+c)/d/e/(e*sec(d*x+c))^(1/2)+2
/3*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+
1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(d*x+c))^(1/2)/d/e^2
```

Rubi [A] time = 0.07, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3486, 3769, 3771, 2641}

$$\frac{2a\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3de^2}-\frac{2ia}{3d(e\sec(c+dx))^{3/2}}+\frac{2a\sin(c+dx)}{3de\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

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

```
[Out] (((-2*I)/3)*a)/(d*(e*Sec[c + d*x])^(3/2)) + (2*a*Sqrt[Cos[c + d*x]]*Ellipti
cF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(3*d*e^2) + (2*a*Sin[c + d*x])/(3*
d*e*Sqrt[e*Sec[c + d*x]])
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

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

Rule 3769

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{a+ia\tan(c+dx)}{(e\sec(c+dx))^{3/2}}\,dx = -\frac{2ia}{3d(e\sec(c+dx))^{3/2}} + a\int \frac{1}{(e\sec(c+dx))^{3/2}}\,dx$$
$$= -\frac{2ia}{3d(e\sec(c+dx))^{3/2}} + \frac{2a\sin(c+dx)}{3de\sqrt{e\sec(c+dx)}} + \frac{a\int \sqrt{e\sec(c+dx)}\,dx}{3e^2}$$
$$= -\frac{2ia}{3d(e\sec(c+dx))^{3/2}} + \frac{2a\sin(c+dx)}{3de\sqrt{e\sec(c+dx)}} + \frac{\left(a\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}\right)\int \frac{}{\sqrt{}}}{3e^2}$$
$$= -\frac{2ia}{3d(e\sec(c+dx))^{3/2}} + \frac{2a\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3de^2} + \frac{2a\sin}{3de\sqrt{e\,\mathrm{s}}}$$

Mathematica [A] time = 0.42, size = 62, normalized size = 0.65

$$\frac{2a\left(\sin(c+dx) - i\cos(c+dx) + \frac{F\left(\frac{1}{2}(c+dx)\middle|2\right)}{\sqrt{\cos(c+dx)}}\right)}{3de\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

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

```
[Out] (2*a*((-I)*Cos[c + d*x] + EllipticF[(c + d*x)/2, 2]/Sqrt[Cos[c + d*x]] + Si
n[c + d*x]))/(3*d*e*Sqrt[e*Sec[c + d*x]])
```

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\frac{3\,de^2\mathrm{integral}\left(-\frac{i\sqrt{2}\,a\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{3\,de^2}, x\right) + \sqrt{2}\left(-i\,ae^{(2i\,dx+2i\,c)} - i\,a\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}}{3\,de^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [A] time = 0.78, size = 170, normalized size = 1.77

$$\frac{2a\left(i\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)}, i\right)\cos(dx+c) + i\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\mathrm{Elliptic}\right.}{3d\cos(dx+c)^2\left(\frac{e}{\cos(dx+c)}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/3*a/d*(I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Ellip
ticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)+I*(1/(1+cos(d*x+c)))^(1/2)*
(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)
-I*cos(d*x+c)^2+cos(d*x+c)*sin(d*x+c))/cos(d*x+c)^2/(e/cos(d*x+c))^(3/2)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+a\tan\left(c+d\,x\right)\,1{}\mathrm{i}}{{\left(\frac{e}{\cos\left(c+d\,x\right)}\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)/(e/cos(c + d*x))^(3/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)/(e/cos(c + d*x))^(3/2), x)
```

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

$$ia\left(\int \left(-\frac{i}{\left(e\sec\left(c+dx\right)\right)^{\frac{3}{2}}}\right)dx+\int \frac{\tan\left(c+dx\right)}{\left(e\sec\left(c+dx\right)\right)^{\frac{3}{2}}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.191 $\int \frac{a+ia\tan(c+dx)}{(e\sec(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=96

$$\frac{6aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5de^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{2ia}{5d(e\sec(c+dx))^{5/2}}+\frac{2a\sin(c+dx)}{5de(e\sec(c+dx))^{3/2}}$$

```
[Out] -2/5*I*a/d/(e*sec(d*x+c))^(5/2)+2/5*a*sin(d*x+c)/d/e/(e*sec(d*x+c))^(3/2)+6
/5*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+
1/2*c),2^(1/2))/d/e^2/cos(d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)
```

Rubi [A] time = 0.07, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3486, 3769, 3771, 2639}

$$\frac{6aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5de^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{2ia}{5d(e\sec(c+dx))^{5/2}}+\frac{2a\sin(c+dx)}{5de(e\sec(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

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

```
[Out] (((-2*I)/5)*a)/(d*(e*Sec[c + d*x])^(5/2)) + (6*a*EllipticE[(c + d*x)/2, 2])
/(5*d*e^2*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c + d*x]]) + (2*a*Sin[c + d*x])/(5*
d*e*(e*Sec[c + d*x])^(3/2))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

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

Rule 3769

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{a+ia\tan(c+dx)}{(e\sec(c+dx))^{5/2}}\,dx = -\frac{2ia}{5d(e\sec(c+dx))^{5/2}} + a\int \frac{1}{(e\sec(c+dx))^{5/2}}\,dx$$
$$= -\frac{2ia}{5d(e\sec(c+dx))^{5/2}} + \frac{2a\sin(c+dx)}{5de(e\sec(c+dx))^{3/2}} + \frac{(3a)\int \frac{1}{\sqrt{e\sec(c+dx)}}\,dx}{5e^2}$$
$$= -\frac{2ia}{5d(e\sec(c+dx))^{5/2}} + \frac{2a\sin(c+dx)}{5de(e\sec(c+dx))^{3/2}} + \frac{(3a)\int \sqrt{\cos(c+dx)}\,dx}{5e^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}$$
$$= -\frac{2ia}{5d(e\sec(c+dx))^{5/2}} + \frac{6aE\left(\frac{1}{2}(c+dx)\middle|2\right)}{5de^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} + \frac{2a\sin(c+dx)}{5de(e\sec(c+dx))^{3/2}}$$

Mathematica [C] time = 0.80, size = 99, normalized size = 1.03

$$-\frac{a(\tan(c+dx)-i)\left(-2\sqrt{1+e^{2i(c+dx)}}\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)-3i\sin(2(c+dx))+2\cos(2(c+dx))+2\right)}{5de^2\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

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

```
[Out] -1/5*(a*(2 + 2*Cos[2*(c + d*x)] - 2*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeom
etric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x))] - (3*I)*Sin[2*(c + d*x)])*(-I
 + Tan[c + d*x]))/(d*e^2*Sqrt[e*Sec[c + d*x]])
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-i\,ae^{(5i\,dx+5i\,c)}+i\,ae^{(4i\,dx+4i\,c)}-8i\,ae^{(3i\,dx+3i\,c)}-4i\,ae^{(2i\,dx+2i\,c)}-7i\,ae^{(i\,dx+i\,c)}-5i\,a\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+10\cdots}{10\left(de^3e^{(2i\,dx+2i\,c)}-de^3e^{(i\cdots}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/10*(sqrt(2)*(-I*a*e^(5*I*d*x + 5*I*c) + I*a*e^(4*I*d*x + 4*I*c) - 8*I*a*e
^(3*I*d*x + 3*I*c) - 4*I*a*e^(2*I*d*x + 2*I*c) - 7*I*a*e^(I*d*x + I*c) - 5*
I*a)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 10*(d*e^3*
e^(2*I*d*x + 2*I*c) - d*e^3*e^(I*d*x + I*c))*integral(1/5*sqrt(2)*(-3*I*a*e
^(2*I*d*x + 2*I*c) - 6*I*a*e^(I*d*x + I*c) - 3*I*a)*sqrt(e/(e^(2*I*d*x + 2*
I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(d*e^3*e^(3*I*d*x + 3*I*c) - 2*d*e^3*e^(
2*I*d*x + 2*I*c) + d*e^3*e^(I*d*x + I*c)), x))/(d*e^3*e^(2*I*d*x + 2*I*c) -
 d*e^3*e^(I*d*x + I*c))
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [B] time = 0.82, size = 341, normalized size = 3.55

$$2a\left(3i\cos\left(dx+c\right)\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\;\mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)\sin\left(dx+c\right)-3i\cos\left(dx+c\right)\sqrt{\frac{1}{1+\cos(}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/5*a/d*(3*I*sin(d*x+c)*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+
cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-3*I*sin(d*x+c)
*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Elli
pticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)+3*I*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/
2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c)
,I)-3*I*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/
2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)-I*sin(d*x+c)*cos(d*x+c)^3-cos(
d*x+c)^4-2*cos(d*x+c)^2+3*cos(d*x+c))/sin(d*x+c)/cos(d*x+c)^3/(e/cos(d*x+c)
)^(5/2)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+a\tan\left(c+d\,x\right)\,1{}\mathrm{i}}{{\left(\frac{e}{\cos\left(c+d\,x\right)}\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)/(e/cos(c + d*x))^(5/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)/(e/cos(c + d*x))^(5/2), x)
```

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

$$ia\left(\int \left(-\frac{i}{\left(e\sec\left(c+dx\right)\right)^{\frac{5}{2}}}\right)dx+\int \frac{\tan\left(c+dx\right)}{\left(e\sec\left(c+dx\right)\right)^{\frac{5}{2}}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.192 $\int \frac{a+ia\tan(c+dx)}{(e\sec(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=125

$$\frac{10a\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{21de^4}+\frac{10a\sin(c+dx)}{21de^3\sqrt{e\sec(c+dx)}}-\frac{2ia}{7d(e\sec(c+dx))^{7/2}}+\frac{2a\sin(c+dx)}{7de(e\sec(c+dx))}$$

```
[Out] -2/7*I*a/d/(e*sec(d*x+c))^(7/2)+2/7*a*sin(d*x+c)/d/e/(e*sec(d*x+c))^(5/2)+1
0/21*a*sin(d*x+c)/d/e^3/(e*sec(d*x+c))^(1/2)+10/21*a*(cos(1/2*d*x+1/2*c)^2)
^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^
(1/2)*(e*sec(d*x+c))^(1/2)/d/e^4
```

Rubi [A] time = 0.08, antiderivative size = 125, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3486, 3769, 3771, 2641}

$$\frac{10a\sin(c+dx)}{21de^3\sqrt{e\sec(c+dx)}}+\frac{10a\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{21de^4}-\frac{2ia}{7d(e\sec(c+dx))^{7/2}}+\frac{2a\sin(c+dx)}{7de(e\sec(c+dx))}$$

Antiderivative was successfully verified.

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

```
[Out] (((-2*I)/7)*a)/(d*(e*Sec[c + d*x])^(7/2)) + (10*a*Sqrt[Cos[c + d*x]]*Ellipt
icF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(21*d*e^4) + (2*a*Sin[c + d*x])/(
7*d*e*(e*Sec[c + d*x])^(5/2)) + (10*a*Sin[c + d*x])/(21*d*e^3*Sqrt[e*Sec[c
+ d*x]])
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

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

Rule 3769

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{a+ia\tan(c+dx)}{(e\sec(c+dx))^{7/2}}\,dx = -\frac{2ia}{7d(e\sec(c+dx))^{7/2}} + a\int \frac{1}{(e\sec(c+dx))^{7/2}}\,dx$$

$$= -\frac{2ia}{7d(e\sec(c+dx))^{7/2}} + \frac{2a\sin(c+dx)}{7de(e\sec(c+dx))^{5/2}} + \frac{(5a)\int \frac{1}{(e\sec(c+dx))^{3/2}}\,dx}{7e^2}$$

$$= -\frac{2ia}{7d(e\sec(c+dx))^{7/2}} + \frac{2a\sin(c+dx)}{7de(e\sec(c+dx))^{5/2}} + \frac{10a\sin(c+dx)}{21de^3\sqrt{e\sec(c+dx)}} + \frac{(5a)\int \sqrt{e\,\mathrm{s}}}{2}$$

$$= -\frac{2ia}{7d(e\sec(c+dx))^{7/2}} + \frac{2a\sin(c+dx)}{7de(e\sec(c+dx))^{5/2}} + \frac{10a\sin(c+dx)}{21de^3\sqrt{e\sec(c+dx)}} + \frac{\left(5a\sqrt{\cos(c}\right.}{}$$

$$= -\frac{2ia}{7d(e\sec(c+dx))^{7/2}} + \frac{10a\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{21de^4} + \frac{2a\,\mathrm{s}}{7de(e\,\mathrm{s}}$$

Mathematica [A] time = 0.76, size = 121, normalized size = 0.97

$$\frac{a\sqrt{e\sec(c+dx)}\,(\cos(c+dx)+i\sin(c+dx))\left(5\sin(c+dx)+5\sin(3(c+dx))-14i\cos(c+dx)+2i\cos(3(c+\right.}{42de^4}$$

Antiderivative was successfully verified.

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

```
[Out] (a*Sqrt[e*Sec[c + d*x]]*(Cos[c + d*x] + I*Sin[c + d*x])*((-14*I)*Cos[c + d*
x] + (2*I)*Cos[3*(c + d*x)] + 20*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2,
2]*(Cos[c + d*x] - I*Sin[c + d*x]) + 5*Sin[c + d*x] + 5*Sin[3*(c + d*x)]))/
(42*d*e^4)
```

fricas [F] time = 0.74, size = 0, normalized size = 0.00

$$\frac{\left(84\,de^4e^{(2i\,dx+2i\,c)}\text{integral}\left(-\frac{5i\,\sqrt{2}\,a\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{21\,de^4},x\right)+\sqrt{2}\left(-3i\,ae^{(6i\,dx+6i\,c)}-19i\,ae^{(4i\,dx+4i\,c)}-9i\,ae^{(2i\,dx}\right.\right.}{84\,de^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/84*(84*d*e^4*e^(2*I*d*x + 2*I*c)*integral(-5/21*I*sqrt(2)*a*sqrt(e/(e^(2*
I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(d*e^4), x) + sqrt(2)*(-3*I*a
*e^(6*I*d*x + 6*I*c) - 19*I*a*e^(4*I*d*x + 4*I*c) - 9*I*a*e^(2*I*d*x + 2*I*
c) + 7*I*a)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))*e^(-
2*I*d*x - 2*I*c)/(d*e^4)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [A] time = 0.84, size = 187, normalized size = 1.50

$$\frac{2a\left(-3i\left(\cos^4(dx+c)\right)+5i\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)\cos(dx+c)+3\left(\cos^3(dx+c)\right)}{21d\left(\frac{e}{\cos(dx+c)}\right)^{\frac{7}{2}}\cos(}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/21*a/d*(-3*I*cos(d*x+c)^4+5*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)+3*cos(
d*x+c)^3*sin(d*x+c)+5*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)+5*cos(d*x+c)*sin(d*x+c))/
(e/cos(d*x+c))^(7/2)/cos(d*x+c)^4
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+a\tan(c+d\,x)\,1\mathrm{i}}{\left(\frac{e}{\cos(c+d\,x)}\right)^{7/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)/(e/cos(c + d*x))^(7/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)/(e/cos(c + d*x))^(7/2), x)
```

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

$$ia\left(\int\left(-\frac{i}{(e\sec(c+dx))^{\frac{7}{2}}}\right)dx+\int\frac{\tan(c+dx)}{(e\sec(c+dx))^{\frac{7}{2}}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] I*a*(Integral(-I/(e*sec(c + d*x))**(7/2), x) + Integral(tan(c + d*x)/(e*sec
(c + d*x))**(7/2), x))
```

3.193 $\int (e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^2\,dx$

Optimal. Leaf size=138

$$-\frac{14a^2e^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{14ia^2(e\sec(c+dx))^{3/2}}{15d}+\frac{14a^2e\sin(c+dx)\sqrt{e\sec(c+dx)}}{5d}+\frac{2i\left(a^2+ia^2\tan(\right.}{}$$

```
[Out] 14/15*I*a^2*(e*sec(d*x+c))^(3/2)/d-14/5*a^2*e^2*(cos(1/2*d*x+1/2*c)^2)^(1/2
)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/d/cos(d*x+c)^(1/
2)/(e*sec(d*x+c))^(1/2)+14/5*a^2*e*sin(d*x+c)*(e*sec(d*x+c))^(1/2)/d+2/5*I*
(e*sec(d*x+c))^(3/2)*(a^2+I*a^2*tan(d*x+c))/d
```

Rubi [A] time = 0.12, antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used = {3498, 3486, 3768, 3771, 2639}

$$-\frac{14a^2e^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{14ia^2(e\sec(c+dx))^{3/2}}{15d}+\frac{14a^2e\sin(c+dx)\sqrt{e\sec(c+dx)}}{5d}+\frac{2i\left(a^2+ia^2\tan(\right.}{}$$

Antiderivative was successfully verified.

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

```
[Out] (-14*a^2*e^2*EllipticE[(c + d*x)/2, 2])/(5*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[
c + d*x]]) + (((14*I)/15)*a^2*(e*Sec[c + d*x])^(3/2))/d + (14*a^2*e*Sqrt[e*
Sec[c + d*x]]*Sin[c + d*x])/(5*d) + (((2*I)/5)*(e*Sec[c + d*x])^(3/2)*(a^2
+ I*a^2*Tan[c + d*x]))/d
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

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

Rule 3498

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

Rule 3768

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
```

EqQ[n^2, 1/4]

Rubi steps

$$\int (e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^2\,dx = \frac{2i(e\sec(c+dx))^{3/2}\left(a^2+ia^2\tan(c+dx)\right)}{5d}+\frac{1}{5}(7a)\int (e\sec(c+dx))$$

$$=\frac{14ia^2(e\sec(c+dx))^{3/2}}{15d}+\frac{2i(e\sec(c+dx))^{3/2}\left(a^2+ia^2\tan(c+dx)\right)}{5d}$$

$$=\frac{14ia^2(e\sec(c+dx))^{3/2}}{15d}+\frac{14a^2e\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5d}+\frac{2i(e\,\mathrm{se}}{}$$

$$=\frac{14ia^2(e\sec(c+dx))^{3/2}}{15d}+\frac{14a^2e\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5d}+\frac{2i(e\,\mathrm{se}}{}$$

$$=-\frac{14a^2e^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}\,\sqrt{e\sec(c+dx)}}+\frac{14ia^2(e\sec(c+dx))^{3/2}}{15d}+\frac{14a^2e}{}$$

Mathematica [C] time = 2.67, size = 267, normalized size = 1.93

$$\frac{(a+ia\tan(c+dx))^2(e\sec(c+dx))^{3/2}\left(\frac{1}{2}\csc(c)(\cos(2c)-i\sin(2c))\sec^{\frac{5}{2}}(c+dx)(20i\sin(2c+dx)+27\cos(2c+d\right.}{15d\sec^{\frac{7}{2}}(c+dx)(\cos(dx)}$$

Antiderivative was successfully verified.

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

```
[Out] ((e*Sec[c + d*x])^(3/2)*(((-14*I)*Sqrt[2]*(3*Sqrt[1 + E^((2*I)*(c + d*x))]
- E^((2*I)*d*x)*(-1 + E^((2*I)*c))*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*
I)*(c + d*x))]))/((-1 + E^((2*I)*c))*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c
+ d*x)))]*Sqrt[1 + E^((2*I)*(c + d*x))]) + (Csc[c]*Sec[c + d*x]^(5/2)*(Cos[
2*c] - I*Sin[2*c])*(36*Cos[d*x] + 27*Cos[2*c + d*x] + 21*Cos[2*c + 3*d*x] -
 (20*I)*Sin[d*x] + (20*I)*Sin[2*c + d*x]))/2)*(a + I*a*Tan[c + d*x])^2)/(15
*d*Sec[c + d*x]^(7/2)*(Cos[d*x] + I*Sin[d*x])^2)
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-42i\,a^2ee^{(5i\,dx+5i\,c)}-32i\,a^2ee^{(3i\,dx+3i\,c)}-14i\,a^2ee^{(i\,dx+i\,c)}\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+15\left(de^{(4i\,dx+4i\,c)}+2\,de^{(2i\,dx+2}\right.}{15\left(de^{(4i\,dx+4i\,c)}+2\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/15*(sqrt(2)*(-42*I*a^2*e*e^(5*I*d*x + 5*I*c) - 32*I*a^2*e*e^(3*I*d*x + 3*
I*c) - 14*I*a^2*e*e^(I*d*x + I*c))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2
*I*d*x + 1/2*I*c) + 15*(d*e^(4*I*d*x + 4*I*c) + 2*d*e^(2*I*d*x + 2*I*c) + d
)*integral(7/5*I*sqrt(2)*a^2*e*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d
*x + 1/2*I*c)/d, x))/(d*e^(4*I*d*x + 4*I*c) + 2*d*e^(2*I*d*x + 2*I*c) + d)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [B] time = 0.90, size = 374, normalized size = 2.71

$$-\frac{2a^2\left(1+\cos\left(dx+c\right)\right)^2\left(-1+\cos\left(dx+c\right)\right)^2\left(21i\sin\left(dx+c\right)\left(\cos^3\left(dx+c\right)\right)\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\;\text{Ellipt}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -2/15*a^2/d*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(21*I*sin(d*x+c)*cos(d*x+c)^
3*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-
1+cos(d*x+c))/sin(d*x+c),I)-21*I*sin(d*x+c)*cos(d*x+c)^3*(1/(1+cos(d*x+c)))
^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*
x+c),I)+21*I*cos(d*x+c)^2*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-21*I*cos(d*x
+c)^2*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)-10*I*cos(d*x+c)*sin(d*x+c)+21*co
s(d*x+c)^3-24*cos(d*x+c)^2+3)*(e/cos(d*x+c))^(3/2)/sin(d*x+c)^5/cos(d*x+c)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int{\left(\frac{e}{\cos\left(c+d\,x\right)}\right)}^{3/2}\,{\left(a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] int((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^2, x)
```

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

$$-a^2\left(\int\left(-\left(e\sec\left(c+dx\right)\right)^{\frac{3}{2}}\right)dx+\int\left(e\sec\left(c+dx\right)\right)^{\frac{3}{2}}\tan^2\left(c+dx\right)dx+\int\left(-2i\left(e\sec\left(c+dx\right)\right)^{\frac{3}{2}}\tan\left(c+dx\right)\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.194 $\int \sqrt{e \sec(c+dx)}\,(a+ia\tan(c+dx))^2\,dx$

Optimal. Leaf size=106

$$\frac{10ia^2\sqrt{e\sec(c+dx)}}{3d}+\frac{2i\left(a^2+ia^2\tan(c+dx)\right)\sqrt{e\sec(c+dx)}}{3d}+\frac{10a^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx}}{3d}$$

```
[Out] 10/3*I*a^2*(e*sec(d*x+c))^(1/2)/d+10/3*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos
(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*s
ec(d*x+c))^(1/2)/d+2/3*I*(e*sec(d*x+c))^(1/2)*(a^2+I*a^2*tan(d*x+c))/d
```

Rubi [A] time = 0.09, antiderivative size = 106, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3498, 3486, 3771, 2641}

$$\frac{10ia^2\sqrt{e\sec(c+dx)}}{3d}+\frac{2i\left(a^2+ia^2\tan(c+dx)\right)\sqrt{e\sec(c+dx)}}{3d}+\frac{10a^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx}}{3d}$$

Antiderivative was successfully verified.

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

```
[Out] (((10*I)/3)*a^2*Sqrt[e*Sec[c + d*x]])/d + (10*a^2*Sqrt[Cos[c + d*x]]*Ellipt
icF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(3*d) + (((2*I)/3)*Sqrt[e*Sec[c +
 d*x]]*(a^2 + I*a^2*Tan[c + d*x]))/d
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

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

Rule 3498

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^2\,dx = \frac{2i\sqrt{e\sec(c+dx)}\left(a^2+ia^2\tan(c+dx)\right)}{3d}+\frac{1}{3}(5a)\int \sqrt{e\sec(c+dx}$$
$$=\frac{10ia^2\sqrt{e\sec(c+dx)}}{3d}+\frac{2i\sqrt{e\sec(c+dx)}\left(a^2+ia^2\tan(c+dx)\right)}{3d}+$$
$$=\frac{10ia^2\sqrt{e\sec(c+dx)}}{3d}+\frac{2i\sqrt{e\sec(c+dx)}\left(a^2+ia^2\tan(c+dx)\right)}{3d}+$$
$$=\frac{10ia^2\sqrt{e\sec(c+dx)}}{3d}+\frac{10a^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(}}{3d}$$

Mathematica [A] time = 0.74, size = 67, normalized size = 0.63

$$\frac{2a^2(e\sec(c+dx))^{3/2}\left(-\sin(c+dx)+6i\cos(c+dx)+5\cos^{\frac{3}{2}}(c+dx)F\left(\frac{1}{2}(c+dx)\middle|2\right)\right)}{3de}$$

Antiderivative was successfully verified.

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

```
[Out] (2*a^2*(e*Sec[c + d*x])^(3/2)*((6*I)*Cos[c + d*x] + 5*Cos[c + d*x]^(3/2)*El
lipticF[(c + d*x)/2, 2] - Sin[c + d*x]))/(3*d*e)
```

fricas [F] time = 0.54, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(14i\,a^2e^{(2i\,dx+2i\,c)}+10i\,a^2\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+3\left(de^{(2i\,dx+2i\,c)}+d\right)\mathrm{integral}\left(-\frac{5i\sqrt{2}\,a^2\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx\right.}}{3\,d}\right.}{3\left(de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*(sqrt(2)*(14*I*a^2*e^(2*I*d*x + 2*I*c) + 10*I*a^2)*sqrt(e/(e^(2*I*d*x +
 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 3*(d*e^(2*I*d*x + 2*I*c) + d)*integ
ral(-5/3*I*sqrt(2)*a^2*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/
2*I*c)/d, x))/(d*e^(2*I*d*x + 2*I*c) + d)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [A] time = 0.91, size = 201, normalized size = 1.90

$$\frac{2a^2\sqrt{\frac{e}{\cos(dx+c)}}\,(-1+\cos(dx+c))^2\left(5i\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\left(\cos^2(dx+c)\right)\mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)+\right.}{3d\cos(d}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/3*a^2/d*(e/cos(d*x+c))^(1/2)*(-1+cos(d*x+c))^2*(5*I*(1/(1+cos(d*x+c)))^(1
/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^2*EllipticF(I*(-1+cos(d*x+
c))/sin(d*x+c),I)+5*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)+6*I*cos(d*x+c)-s
in(d*x+c))*(1+cos(d*x+c))^2/cos(d*x+c)/sin(d*x+c)^4
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \sqrt{\frac{e}{\cos(c+d\,x)}}\,(a+a\tan(c+d\,x)\,1\mathrm{i})^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^2, x)
```

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

$$-a^2\left(\int\left(-\sqrt{e\sec(c+dx)}\right)dx+\int\sqrt{e\sec(c+dx)}\,\tan^2(c+dx)\,dx+\int\left(-2i\sqrt{e\sec(c+dx)}\,\tan(c+dx)\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a**2*(Integral(-sqrt(e*sec(c + d*x)), x) + Integral(sqrt(e*sec(c + d*x))*t
an(c + d*x)**2, x) + Integral(-2*I*sqrt(e*sec(c + d*x))*tan(c + d*x), x))
```

3.195 $\int \frac{(a+ia\tan(c+dx))^2}{\sqrt{e\sec(c+dx)}}\,dx$

Optimal. Leaf size=107

$$-\frac{6a^2\sin(c+dx)\sqrt{e\sec(c+dx)}}{de}-\frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{d\sqrt{e\sec(c+dx)}}+\frac{6a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}$$

```
[Out] 6*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x
+1/2*c),2^(1/2))/d/cos(d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)-6*a^2*sin(d*x+c)*(
e*sec(d*x+c))^(1/2)/d/e-4*I*(a^2+I*a^2*tan(d*x+c))/d/(e*sec(d*x+c))^(1/2)
```

Rubi [A] time = 0.08, antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3496, 3768, 3771, 2639}

$$-\frac{6a^2\sin(c+dx)\sqrt{e\sec(c+dx)}}{de}-\frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{d\sqrt{e\sec(c+dx)}}+\frac{6a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

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

```
[Out] (6*a^2*EllipticE[(c + d*x)/2, 2])/(d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c + d*x]
]) - (6*a^2*Sqrt[e*Sec[c + d*x]]*Sin[c + d*x])/(d*e) - ((4*I)*(a^2 + I*a^2*
Tan[c + d*x]))/(d*Sqrt[e*Sec[c + d*x]])
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3768

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^2}{\sqrt{e\sec(c+dx)}}\,dx = -\frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{d\sqrt{e\sec(c+dx)}} - \frac{\left(3a^2\right)\int (e\sec(c+dx))^{3/2}\,dx}{e^2}$$
$$= -\frac{6a^2\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{de} - \frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{d\sqrt{e\sec(c+dx)}} + \left(3a^2\right)\int \frac{1}{\sqrt{e\sec(c+d}}$$
$$= -\frac{6a^2\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{de} - \frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{d\sqrt{e\sec(c+dx)}} + \frac{\left(3a^2\right)\int\sqrt{\cos(c+d}}{\sqrt{\cos(c+dx)}\sqrt{e\sec}}$$
$$= \frac{6a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} - \frac{6a^2\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{de} - \frac{4i\left(a^2+ia^2\tan(\right.}{d\sqrt{e\sec(c+}}$$

Mathematica [C] time = 1.19, size = 132, normalized size = 1.23

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

Antiderivative was successfully verified.

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

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

fricas [F] time = 0.60, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-4i\,a^2e^{(2i\,dx+2i\,c)}-2i\,a^2e^{(i\,dx+i\,c)}-6i\,a^2\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+\left(dee^{(i\,dx+i\,c)}-de\right)\text{integral}\left(\frac{\sqrt{2}\left(-3i\,a^2e^{(2i\,dx+2i\,c)}\right.}{dee^{(3i\,d}}\right.}{dee^{(i\,dx+i\,c)}-de}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] (sqrt(2)*(-4*I*a^2*e^(2*I*d*x + 2*I*c) - 2*I*a^2*e^(I*d*x + I*c) - 6*I*a^2)
*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + (d*e*e^(I*d*x
+ I*c) - d*e)*integral(sqrt(2)*(-3*I*a^2*e^(2*I*d*x + 2*I*c) - 6*I*a^2*e^(I
*d*x + I*c) - 3*I*a^2)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2
*I*c)/(d*e*e^(3*I*d*x + 3*I*c) - 2*d*e*e^(2*I*d*x + 2*I*c) + d*e*e^(I*d*x +
 I*c)), x))/(d*e*e^(I*d*x + I*c) - d*e)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [B] time = 0.96, size = 1099, normalized size = 10.27

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] a^2/d*(-1+cos(d*x+c))*(12*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x
+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)^2*sin(d*x+
c)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)+4*I*(-cos(d*x+c)/(1+cos(d*x+c))^2)^
(3/2)*cos(d*x+c)*sin(d*x+c)-6*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)*cos(d*x+c)*EllipticE(I
*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(d*x+c)-12*I*(1/(1+cos(d*x+c)))^(1/2)*(co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*co
s(d*x+c)^2*sin(d*x+c)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)-6*I*(1/(1+cos(d*
x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/
sin(d*x+c),I)*cos(d*x+c)^3*sin(d*x+c)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)+
12*I*cos(d*x+c)^3*sin(d*x+c)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)+4*cos(d*x
+c)^5*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)+I*ln(-2*(2*cos(d*x+c)^2*(-cos(d*
x+c)/(1+cos(d*x+c))^2)^(1/2)-cos(d*x+c)^2+2*cos(d*x+c)-2*(-cos(d*x+c)/(1+co
s(d*x+c))^2)^(1/2)-1)/sin(d*x+c)^2)*cos(d*x+c)^2*sin(d*x+c)-I*cos(d*x+c)^2*
ln(-(2*cos(d*x+c)^2*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)-cos(d*x+c)^2+2*cos
(d*x+c)-2*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)-1)/sin(d*x+c)^2)*sin(d*x+c)+
4*I*cos(d*x+c)^4*sin(d*x+c)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)+6*cos(d*x+
c)^4*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)+6*I*(1/(1+cos(d*x+c)))^(1/2)*(cos
(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*(-c
os(d*x+c)/(1+cos(d*x+c))^2)^(1/2)*cos(d*x+c)*sin(d*x+c)-4*(-cos(d*x+c)/(1+c
os(d*x+c))^2)^(3/2)*cos(d*x+c)^3+6*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)^3
*sin(d*x+c)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)+12*I*(-cos(d*x+c)/(1+cos(d
*x+c))^2)^(3/2)*cos(d*x+c)^2*sin(d*x+c)-8*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3
/2)*cos(d*x+c)^2+2*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2))/(1+cos(d*x+c))^2/c
os(d*x+c)/sin(d*x+c)^3/(e/cos(d*x+c))^(1/2)/(-cos(d*x+c)/(1+cos(d*x+c))^2)^
(3/2)
```

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

$$\int \frac{(i a \tan(dx + c) + a)^2}{\sqrt{e \sec(dx + c)}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a + a \tan(c + d x)\, 1\mathrm{i})^2}{\sqrt{\frac{e}{\cos(c+d x)}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] int((a + a*tan(c + d*x)*1i)^2/(e/cos(c + d*x))^(1/2), x)
```

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

$$-a^2 \left(\int \left(-\frac{1}{\sqrt{e \sec(c + dx)}} \right) dx + \int \frac{\tan^2(c + dx)}{\sqrt{e \sec(c + dx)}} dx + \int \left(-\frac{2i \tan(c + dx)}{\sqrt{e \sec(c + dx)}} \right) dx \right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a**2*(Integral(-1/sqrt(e*sec(c + d*x)), x) + Integral(tan(c + d*x)**2/sqrt
(e*sec(c + d*x)), x) + Integral(-2*I*tan(c + d*x)/sqrt(e*sec(c + d*x)), x))
```

3.196 $\int \frac{(a+ia\tan(c+dx))^2}{(e\sec(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=85

$$-\frac{2a^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3de^2}-\frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{3d(e\sec(c+dx))^{3/2}}$$

```
[Out] -2/3*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*
d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(d*x+c))^(1/2)/d/e^2-4/3*I*(a^2+
I*a^2*tan(d*x+c))/d/(e*sec(d*x+c))^(3/2)
```

Rubi [A] time = 0.07, antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.107, Rules used = {3496, 3771, 2641}

$$-\frac{2a^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3de^2}-\frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{3d(e\sec(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

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

```
[Out] (-2*a^2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/
(3*d*e^2) - (((4*I)/3)*(a^2 + I*a^2*Tan[c + d*x]))/(d*(e*Sec[c + d*x])^(3/2
))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^2}{(e\sec(c+dx))^{3/2}}\,dx = -\frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{3d(e\sec(c+dx))^{3/2}} - \frac{a^2\int\sqrt{e\sec(c+dx)}\,dx}{3e^2}$$
$$= -\frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{3d(e\sec(c+dx))^{3/2}} - \frac{\left(a^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3e^2}$$
$$= -\frac{2a^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3de^2} - \frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{3d(e\sec(c+dx))^{3/2}}$$

Mathematica [A] time = 0.59, size = 114, normalized size = 1.34

$$-\frac{2a^2\sec^2(c+dx)(\cos(c+3dx)+i\sin(c+3dx))\left(2i\cos(c+dx)+\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)(\cos(c+dx)-i\right.}{3d(\cos(dx)+i\sin(dx))^2(e\sec(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

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

```
[Out] (-2*a^2*Sec[c + d*x]^2*((2*I)*Cos[c + d*x] + Sqrt[Cos[c + d*x]]*EllipticF[(
c + d*x)/2, 2]*(Cos[c + d*x] - I*Sin[c + d*x]))*(Cos[c + 3*d*x] + I*Sin[c +
 3*d*x]))/(3*d*(e*Sec[c + d*x])^(3/2)*(Cos[d*x] + I*Sin[d*x])^2)
```

fricas [F] time = 0.63, size = 0, normalized size = 0.00

$$\frac{3\,de^2\text{integral}\left(\frac{i\sqrt{2}\,a^2\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{3\,de^2},x\right)+\sqrt{2}\left(-2i\,a^2e^{(2i\,dx+2i\,c)}-2i\,a^2\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}}{3\,de^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [A] time = 0.84, size = 173, normalized size = 2.04

$$-\frac{2a^2\left(i\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\text{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)\cos(dx+c)+i\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\text{EllipticF}\right.}{3d\cos(dx+c)^2\left(\frac{e}{\cos(dx+c)}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -2/3*a^2/d*(I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*El
lipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)+I*(1/(1+cos(d*x+c)))^(1/
2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c)
,I)+2*I*cos(d*x+c)^2-2*cos(d*x+c)*sin(d*x+c))/cos(d*x+c)^2/(e/cos(d*x+c))^(
3/2)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+a\tan(c+d\,x)\,1\mathrm{i})^2}{\left(\frac{e}{\cos(c+d\,x)}\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^2/(e/cos(c + d*x))^(3/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^2/(e/cos(c + d*x))^(3/2), x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a**2*(Integral(-1/(e*sec(c + d*x))**(3/2), x) + Integral(tan(c + d*x)**2/(
e*sec(c + d*x))**(3/2), x) + Integral(-2*I*tan(c + d*x)/(e*sec(c + d*x))**(
3/2), x))
```

3.197 $\int \frac{(a+ia\tan(c+dx))^2}{(e\sec(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=85

$$\frac{2a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5de^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{5d(e\sec(c+dx))^{5/2}}$$

```
[Out] 2/5*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d
*x+1/2*c),2^(1/2))/d/e^2/cos(d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)-4/5*I*(a^2+I
*a^2*tan(d*x+c))/d/(e*sec(d*x+c))^(5/2)
```

Rubi [A] time = 0.07, antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.107, Rules used = {3496, 3771, 2639}

$$\frac{2a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5de^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{5d(e\sec(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

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

```
[Out] (2*a^2*EllipticE[(c + d*x)/2, 2])/(5*d*e^2*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c
+ d*x]]) - (((4*I)/5)*(a^2 + I*a^2*Tan[c + d*x]))/(d*(e*Sec[c + d*x])^(5/2)
)
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^2}{(e\sec(c+dx))^{5/2}}\,dx = -\frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{5d(e\sec(c+dx))^{5/2}} + \frac{a^2\int \frac{1}{\sqrt{e\sec(c+dx)}}\,dx}{5e^2}$$
$$= -\frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{5d(e\sec(c+dx))^{5/2}} + \frac{a^2\int \sqrt{\cos(c+dx)}\,dx}{5e^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}$$
$$= \frac{2a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5de^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} - \frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{5d(e\sec(c+dx))^{5/2}}$$

Mathematica [C] time = 1.15, size = 114, normalized size = 1.34

$$-\frac{i\sqrt{2}\,a^2\left(1+e^{2i(c+dx)}\right)^{3/2}\left(\frac{ee^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{3/2}\left(2\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)+3\sqrt{1+e^{2i(c+dx)}}\right)}{15de^4}$$

Antiderivative was successfully verified.

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

```
[Out] ((-1/15*I)*Sqrt[2]*a^2*((e*E^(I*(c + d*x)))/(1 + E^((2*I)*(c + d*x))))^(3/2
)*(1 + E^((2*I)*(c + d*x)))^(3/2)*(3*Sqrt[1 + E^((2*I)*(c + d*x))] + 2*Hype
rgeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x))]))/(d*e^4)
```

fricas [F] time = 0.52, size = 0, normalized size = 0.00

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/5*(sqrt(2)*(-I*a^2*e^(4*I*d*x + 4*I*c) + I*a^2*e^(3*I*d*x + 3*I*c) - 3*I*
a^2*e^(2*I*d*x + 2*I*c) + I*a^2*e^(I*d*x + I*c) - 2*I*a^2)*sqrt(e/(e^(2*I*d
*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 5*(d*e^3*e^(I*d*x + I*c) - d*e^
3)*integral(1/5*sqrt(2)*(-I*a^2*e^(2*I*d*x + 2*I*c) - 2*I*a^2*e^(I*d*x + I*
c) - I*a^2)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(d*e^
3*e^(3*I*d*x + 3*I*c) - 2*d*e^3*e^(2*I*d*x + 2*I*c) + d*e^3*e^(I*d*x + I*c)
), x))/(d*e^3*e^(I*d*x + I*c) - d*e^3)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [B] time = 0.81, size = 343, normalized size = 4.04

$$-\frac{2a^2\left(i\cos(dx+c)\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \mathrm{EllipticE}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)\sin(dx+c)-i\cos(dx+c)\sqrt{\frac{1}{1+\cos(\cdots}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -2/5*a^2/d*(I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*co
s(d*x+c)*sin(d*x+c)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)-I*(1/(1+cos(d
*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)*sin(d*x+c)*Ellip
ticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)+2*I*cos(d*x+c)^3*sin(d*x+c)+I*(1/(1+co
s(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)*EllipticE(I*(
-1+cos(d*x+c))/sin(d*x+c),I)-I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(
d*x+c)))^(1/2)*sin(d*x+c)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)+2*cos(d
*x+c)^4-cos(d*x+c)^2-cos(d*x+c))/cos(d*x+c)^3/sin(d*x+c)/(e/cos(d*x+c))^(5/
2)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+a\tan(c+d\,x)\,1\mathrm{i})^2}{\left(\frac{e}{\cos(c+d\,x)}\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^2/(e/cos(c + d*x))^(5/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^2/(e/cos(c + d*x))^(5/2), x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a**2*(Integral(-1/(e*sec(c + d*x))**(5/2), x) + Integral(tan(c + d*x)**2/(
e*sec(c + d*x))**(5/2), x) + Integral(-2*I*tan(c + d*x)/(e*sec(c + d*x))**(
5/2), x))
```

3.198 $\int \frac{(a+ia\tan(c+dx))^2}{(e\sec(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=116

$$\frac{2a^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{7de^4}+\frac{2a^2\sin(c+dx)}{7de^3\sqrt{e\sec(c+dx)}}-\frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{7d(e\sec(c+dx))^{7/2}}$$

```
[Out] 2/7*a^2*sin(d*x+c)/d/e^3/(e*sec(d*x+c))^(1/2)+2/7*a^2*(cos(1/2*d*x+1/2*c)^2
)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)
^(1/2)*(e*sec(d*x+c))^(1/2)/d/e^4-4/7*I*(a^2+I*a^2*tan(d*x+c))/d/(e*sec(d*x
+c))^(7/2)
```

Rubi [A] time = 0.09, antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3496, 3769, 3771, 2641}

$$\frac{2a^2\sin(c+dx)}{7de^3\sqrt{e\sec(c+dx)}}+\frac{2a^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{7de^4}-\frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{7d(e\sec(c+dx))^{7/2}}$$

Antiderivative was successfully verified.

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

```
[Out] (2*a^2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(
7*d*e^4) + (2*a^2*Sin[c + d*x])/(7*d*e^3*Sqrt[e*Sec[c + d*x]]) - (((4*I)/7)
*(a^2 + I*a^2*Tan[c + d*x]))/(d*(e*Sec[c + d*x])^(7/2))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3769

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^2}{(e\sec(c+dx))^{7/2}}\,dx = -\frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{7d(e\sec(c+dx))^{7/2}}+\frac{(3a^2)\int \frac{1}{(e\sec(c+dx))^{3/2}}\,dx}{7e^2}$$

$$= \frac{2a^2\sin(c+dx)}{7de^3\sqrt{e\sec(c+dx)}}-\frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{7d(e\sec(c+dx))^{7/2}}+\frac{a^2\int\sqrt{e\sec(c+dx)}\,dx}{7e^4}$$

$$= \frac{2a^2\sin(c+dx)}{7de^3\sqrt{e\sec(c+dx)}}-\frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{7d(e\sec(c+dx))^{7/2}}+\frac{\left(a^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}\right)}{7e^4}$$

$$= \frac{2a^2\sqrt{\cos(c+dx)}F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{7de^4}+\frac{2a^2\sin(c+dx)}{7de^3\sqrt{e\sec(c+dx)}}-\frac{4i\left(a^2+\right.}{7d(e\,\mathrm{s}}$$

Mathematica [A] time = 1.04, size = 133, normalized size = 1.15

$$\frac{a^2\sqrt{e\sec(c+dx)}(\cos(2(c+2dx))+i\sin(2(c+2dx)))\left(-\sin(2(c+dx))-2i\cos(2(c+dx))+2\sqrt{\cos(c+dx)}F\left(\frac{1}{2}\right.\right.}{7de^4(\cos(dx)+i\sin(dx))^2}$$

Antiderivative was successfully verified.

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

```
[Out] (a^2*Sqrt[e*Sec[c + d*x]]*(-2*I - (2*I)*Cos[2*(c + d*x)] + 2*Sqrt[Cos[c + d
*x]]*EllipticF[(c + d*x)/2, 2]*(Cos[2*(c + d*x)] - I*Sin[2*(c + d*x)]) - Si
n[2*(c + d*x)])*(Cos[2*(c + 2*d*x)] + I*Sin[2*(c + 2*d*x)]))/(7*d*e^4*(Cos[
d*x] + I*Sin[d*x])^2)
```

fricas [F] time = 0.63, size = 0, normalized size = 0.00

$$\frac{14\,de^4\mathrm{integral}\left(-\frac{i\sqrt{2}a^2\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{7\,de^4},x\right)+\sqrt{2}\left(-i\,a^2e^{(4i\,dx+4i\,c)}-4i\,a^2e^{(2i\,dx+2i\,c)}-3i\,a^2\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}e^{\left(\frac{1}{2}i\,d\right.}}{14\,de^4}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/14*(14*d*e^4*integral(-1/7*I*sqrt(2)*a^2*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1)
)*e^(-1/2*I*d*x - 1/2*I*c)/(d*e^4), x) + sqrt(2)*(-I*a^2*e^(4*I*d*x + 4*I*c
) - 4*I*a^2*e^(2*I*d*x + 2*I*c) - 3*I*a^2)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1)
)*e^(1/2*I*d*x + 1/2*I*c))/(d*e^4)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [A] time = 0.85, size = 189, normalized size = 1.63

$$-\frac{2a^2\left(2i\left(\cos^4(dx+c)\right)-i\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)\cos(dx+c)-2\left(\cos^3(dx+c)\right)\right.}{7d\cos(dx+c)^4\left(\frac{e}{\cos(d}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -2/7*a^2/d*(2*I*cos(d*x+c)^4-I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(
d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)-2*cos(d
*x+c)^3*sin(d*x+c)-I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(
1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-cos(d*x+c)*sin(d*x+c))/cos(d
*x+c)^4/(e/cos(d*x+c))^(7/2)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+a\tan(c+d\,x)\,1\mathrm{i})^2}{\left(\frac{e}{\cos(c+d\,x)}\right)^{7/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^2/(e/cos(c + d*x))^(7/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^2/(e/cos(c + d*x))^(7/2), x)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -a**2*(Integral(-1/(e*sec(c + d*x))**(7/2), x) + Integral(tan(c + d*x)**2/(
e*sec(c + d*x))**(7/2), x) + Integral(-2*I*tan(c + d*x)/(e*sec(c + d*x))**(
7/2), x))
```

3.199 $\int \frac{(a+ia\tan(c+dx))^2}{(e\sec(c+dx))^{9/2}}\,dx$

Optimal. Leaf size=116

$$\frac{2a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{3de^4\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{2a^2\sin(c+dx)}{9de^3(e\sec(c+dx))^{3/2}}-\frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{9d(e\sec(c+dx))^{9/2}}$$

```
[Out] 2/9*a^2*sin(d*x+c)/d/e^3/(e*sec(d*x+c))^(3/2)+2/3*a^2*(cos(1/2*d*x+1/2*c)^2
)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/d/e^4/cos(
d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)-4/9*I*(a^2+I*a^2*tan(d*x+c))/d/(e*sec(d*x
+c))^(9/2)
```

Rubi [A] time = 0.09, antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3496, 3769, 3771, 2639}

$$\frac{2a^2\sin(c+dx)}{9de^3(e\sec(c+dx))^{3/2}}+\frac{2a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{3de^4\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{9d(e\sec(c+dx))^{9/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^2/(e*Sec[c + d*x])^(9/2),x]
```

```
[Out] (2*a^2*EllipticE[(c + d*x)/2, 2])/(3*d*e^4*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c
+ d*x]]) + (2*a^2*Sin[c + d*x])/(9*d*e^3*(e*Sec[c + d*x])^(3/2)) - (((4*I)/
9)*(a^2 + I*a^2*Tan[c + d*x]))/(d*(e*Sec[c + d*x])^(9/2))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3769

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^2}{(e\sec(c+dx))^{9/2}}\,dx = -\frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{9d(e\sec(c+dx))^{9/2}} + \frac{\left(5a^2\right)\int \frac{1}{(e\sec(c+dx))^{5/2}}\,dx}{9e^2}$$
$$= \frac{2a^2\sin(c+dx)}{9de^3(e\sec(c+dx))^{3/2}} - \frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{9d(e\sec(c+dx))^{9/2}} + \frac{a^2\int \frac{1}{\sqrt{e\sec(c+dx)}}\,dx}{3e^4}$$
$$= \frac{2a^2\sin(c+dx)}{9de^3(e\sec(c+dx))^{3/2}} - \frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{9d(e\sec(c+dx))^{9/2}} + \frac{a^2\int \sqrt{\cos(c+dx)}\,dx}{3e^4\sqrt{\cos(c+dx)}\sqrt{e\sec(c+}$$
$$= \frac{2a^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{3de^4\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} + \frac{2a^2\sin(c+dx)}{9de^3(e\sec(c+dx))^{3/2}} - \frac{4i\left(a^2+ia^2\tan(c+\right.}{9d(e\sec(c+dx)}$$

Mathematica [C] time = 1.88, size = 133, normalized size = 1.15

$$\frac{ia^2\left(-\frac{8e^{2i(c+dx)}\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)}{\sqrt{1+e^{2i(c+dx)}}} - 4e^{2i(c+dx)} - e^{4i(c+dx)} + 9\right)}{18\sqrt{2}\,de^4\sqrt{\frac{ee^{i(c+dx)}}{1+e^{2i(c+dx)}}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^2/(e*Sec[c + d*x])^(9/2),x]
```

```
[Out] ((I/18)*a^2*(9 - 4*E^((2*I)*(c + d*x)) - E^((4*I)*(c + d*x)) - (8*E^((2*I)*
(c + d*x))*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x))])/Sqrt[1 +
 E^((2*I)*(c + d*x))]))/(Sqrt[2]*d*e^4*Sqrt[(e*E^(I*(c + d*x)))/(1 + E^((2*
I)*(c + d*x)))])
```

fricas [F] time = 0.68, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-i\,a^2e^{(7i\,dx+7i\,c)} + i\,a^2e^{(6i\,dx+6i\,c)} - 5i\,a^2e^{(5i\,dx+5i\,c)} + 5i\,a^2e^{(4i\,dx+4i\,c)} - 19i\,a^2e^{(3i\,dx+3i\,c)} - 5i\,a^2e^{(2i\,dx+2i\,c)} - 15i\,a\right.}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^2/(e*sec(d*x+c))^(9/2),x, algorithm="fricas")
```

```
[Out] 1/36*(sqrt(2)*(-I*a^2*e^(7*I*d*x + 7*I*c) + I*a^2*e^(6*I*d*x + 6*I*c) - 5*I
*a^2*e^(5*I*d*x + 5*I*c) + 5*I*a^2*e^(4*I*d*x + 4*I*c) - 19*I*a^2*e^(3*I*d*
x + 3*I*c) - 5*I*a^2*e^(2*I*d*x + 2*I*c) - 15*I*a^2*e^(I*d*x + I*c) - 9*I*a
^2)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 36*(d*e^5*e
^(2*I*d*x + 2*I*c) - d*e^5*e^(I*d*x + I*c))*integral(1/3*sqrt(2)*(-I*a^2*e^
(2*I*d*x + 2*I*c) - 2*I*a^2*e^(I*d*x + I*c) - I*a^2)*sqrt(e/(e^(2*I*d*x + 2
*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(d*e^5*e^(3*I*d*x + 3*I*c) - 2*d*e^5*e^
(2*I*d*x + 2*I*c) + d*e^5*e^(I*d*x + I*c)), x))/(d*e^5*e^(2*I*d*x + 2*I*c)
- d*e^5*e^(I*d*x + I*c))
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^2}{(e\sec(dx+c))^{\frac{9}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^2/(e*sec(d*x+c))^(9/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^2/(e*sec(d*x + c))^(9/2), x)
```

maple [B] time = 0.94, size = 353, normalized size = 3.04

$$-\frac{2a^2\left(2i\left(\cos^5(dx+c)\right)\sin(dx+c)+2\left(\cos^6(dx+c)\right)-3i\cos(dx+c)\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \mathrm{EllipticF}\left(\frac{i(-}{}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^2/(e*sec(d*x+c))^(9/2),x)
```

```
[Out] -2/9*a^2/d*(2*I*cos(d*x+c)^5*sin(d*x+c)+2*cos(d*x+c)^6-3*I*cos(d*x+c)*(1/(1
+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d
*x+c))/sin(d*x+c),I)*sin(d*x+c)+3*I*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*si
n(d*x+c)-3*I*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(d*x+c)*(1/(1+cos
(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+3*I*(1/(1+cos(d*x+c)))^(1
/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)*EllipticE(I*(-1+cos(d*x+c)
)/sin(d*x+c),I)-cos(d*x+c)^4+2*cos(d*x+c)^2-3*cos(d*x+c))/cos(d*x+c)^5/sin(
d*x+c)/(e/cos(d*x+c))^(9/2)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^2}{(e\sec(dx+c))^{\frac{9}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^2/(e*sec(d*x+c))^(9/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^2/(e*sec(d*x + c))^(9/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+a\tan(c+d\,x)\,1\mathrm{i})^2}{\left(\frac{e}{\cos(c+d\,x)}\right)^{9/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^2/(e/cos(c + d*x))^(9/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^2/(e/cos(c + d*x))^(9/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**2/(e*sec(d*x+c))**(9/2),x)
```

```
[Out] Timed out
```

3.200 $\int \frac{(a+ia\tan(c+dx))^2}{(e\sec(c+dx))^{11/2}}\,dx$

Optimal. Leaf size=147

$$\frac{10a^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{33de^6}+\frac{10a^2\sin(c+dx)}{33de^5\sqrt{e\sec(c+dx)}}+\frac{2a^2\sin(c+dx)}{11de^3(e\sec(c+dx))^{5/2}}-\frac{4i\left(a^2+ia^2\right.}{11d(e\sec}$$

```
[Out] 2/11*a^2*sin(d*x+c)/d/e^3/(e*sec(d*x+c))^(5/2)+10/33*a^2*sin(d*x+c)/d/e^5/(
e*sec(d*x+c))^(1/2)+10/33*a^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*
c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(d*x+c))^(1
/2)/d/e^6-4/11*I*(a^2+I*a^2*tan(d*x+c))/d/(e*sec(d*x+c))^(11/2)
```

Rubi [A] time = 0.11, antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {3496, 3769, 3771, 2641}

$$\frac{10a^2\sin(c+dx)}{33de^5\sqrt{e\sec(c+dx)}}+\frac{2a^2\sin(c+dx)}{11de^3(e\sec(c+dx))^{5/2}}+\frac{10a^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{33de^6}-\frac{4i\left(a^2+ia^2\right.}{11d(e\sec}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^2/(e*Sec[c + d*x])^(11/2),x]
```

```
[Out] (10*a^2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/
(33*d*e^6) + (2*a^2*Sin[c + d*x])/(11*d*e^3*(e*Sec[c + d*x])^(5/2)) + (10*a
^2*Sin[c + d*x])/(33*d*e^5*Sqrt[e*Sec[c + d*x]]) - (((4*I)/11)*(a^2 + I*a^2
*Tan[c + d*x]))/(d*(e*Sec[c + d*x])^(11/2))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3769

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^2}{(e\sec(c+dx))^{11/2}}\,dx = -\frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{11d(e\sec(c+dx))^{11/2}} + \frac{(7a^2)\int \frac{1}{(e\sec(c+dx))^{7/2}}\,dx}{11e^2}$$

$$= \frac{2a^2\sin(c+dx)}{11de^3(e\sec(c+dx))^{5/2}} - \frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{11d(e\sec(c+dx))^{11/2}} + \frac{(5a^2)\int \frac{1}{(e\sec(c+dx))^{3/2}}\,dx}{11e^4}$$

$$= \frac{2a^2\sin(c+dx)}{11de^3(e\sec(c+dx))^{5/2}} + \frac{10a^2\sin(c+dx)}{33de^5\sqrt{e\sec(c+dx)}} - \frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{11d(e\sec(c+dx))^{11/2}} + \frac{(5a^2)\ \ldots}{}$$

$$= \frac{2a^2\sin(c+dx)}{11de^3(e\sec(c+dx))^{5/2}} + \frac{10a^2\sin(c+dx)}{33de^5\sqrt{e\sec(c+dx)}} - \frac{4i\left(a^2+ia^2\tan(c+dx)\right)}{11d(e\sec(c+dx))^{11/2}} + \frac{(5a^2\sqrt{\ldots}}{}$$

$$= \frac{10a^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{33de^6} + \frac{2a^2\sin(c+dx)}{11de^3(e\sec(c+dx))^{5/2}} + \frac{10\ldots}{33de\ldots}$$

Mathematica [A] time = 1.39, size = 155, normalized size = 1.05

$$\frac{a^2\sqrt{e\sec(c+dx)}\,(\cos(2(c+2dx))+i\sin(2(c+2dx)))\left(-6\sin(2(c+dx))+7\sin(4(c+dx))-24i\cos(2(c+dx))\ \ldots\right.}{132de^6(\cos(dx)+i\sin(\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^2/(e*Sec[c + d*x])^(11/2),x]
```

```
[Out] (a^2*Sqrt[e*Sec[c + d*x]]*(-28*I - (24*I)*Cos[2*(c + d*x)] + (4*I)*Cos[4*(c
 + d*x)] + 40*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*(Cos[2*(c + d*x)
] - I*Sin[2*(c + d*x)]) - 6*Sin[2*(c + d*x)] + 7*Sin[4*(c + d*x)])*(Cos[2*(
c + 2*d*x)] + I*Sin[2*(c + 2*d*x)]))/(132*d*e^6*(Cos[d*x] + I*Sin[d*x])^2)
```

fricas [F] time = 0.66, size = 0, normalized size = 0.00

$$\frac{\left(264\,de^6e^{(2i\,dx+2i\,c)}\text{integral}\left(-\frac{5i\,\sqrt{2}\,a^2\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{33\,de^6},x\right)+\sqrt{2}\left(-3i\,a^2e^{(8i\,dx+8i\,c)}-18i\,a^2e^{(6i\,dx+6i\,c)}-56i\,a^2e^{(4\ldots}\right.\right.}{264\,de^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^2/(e*sec(d*x+c))^(11/2),x, algorithm="fricas")
```

```
[Out] 1/264*(264*d*e^6*e^(2*I*d*x + 2*I*c)*integral(-5/33*I*sqrt(2)*a^2*sqrt(e/(e
^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(d*e^6), x) + sqrt(2)*(-3
*I*a^2*e^(8*I*d*x + 8*I*c) - 18*I*a^2*e^(6*I*d*x + 6*I*c) - 56*I*a^2*e^(4*I
*d*x + 4*I*c) - 30*I*a^2*e^(2*I*d*x + 2*I*c) + 11*I*a^2)*sqrt(e/(e^(2*I*d*x
 + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))*e^(-2*I*d*x - 2*I*c)/(d*e^6)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^2}{(e\sec(dx+c))^{\frac{11}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^2/(e*sec(d*x+c))^(11/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^2/(e*sec(d*x + c))^(11/2), x)
```

maple [A] time = 1.06, size = 205, normalized size = 1.39

$$-\frac{2a^{2}\left(6i\left(\cos^{6}\left(dx+c\right)\right)-6\left(\cos^{5}\left(dx+c\right)\right)\sin\left(dx+c\right)-5i\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c)}{\sin(dx+c)}\right.\right.}{33\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^2/(e*sec(d*x+c))^(11/2),x)
```

```
[Out] -2/33*a^2/d*(6*I*cos(d*x+c)^6-6*cos(d*x+c)^5*sin(d*x+c)-5*I*(1/(1+cos(d*x+c
)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin
(d*x+c),I)*cos(d*x+c)-3*cos(d*x+c)^3*sin(d*x+c)-5*I*(1/(1+cos(d*x+c)))^(1/2
)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),
I)-5*cos(d*x+c)*sin(d*x+c))/cos(d*x+c)^6/(e/cos(d*x+c))^(11/2)
```

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

$$\int \frac{\left(i\,a\tan\left(dx+c\right)+a\right)^{2}}{\left(e\sec\left(dx+c\right)\right)^{\frac{11}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^2/(e*sec(d*x+c))^(11/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^2/(e*sec(d*x + c))^(11/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+a\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)^{2}}{\left(\frac{e}{\cos(c+d\,x)}\right)^{11/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^2/(e/cos(c + d*x))^(11/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^2/(e/cos(c + d*x))^(11/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**2/(e*sec(d*x+c))**(11/2),x)
```

```
[Out] Timed out
```

3.201 $\int (e\sec(c+dx))^{7/2}(a+ia\tan(c+dx))^3\,dx$

Optimal. Leaf size=202

$$-\frac{2a^3e^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{2a^3e^3\sin(c+dx)\sqrt{e\sec(c+dx)}}{d}+\frac{10ia^3(e\sec(c+dx))^{7/2}}{21d}+\frac{2a^3e\sin(c+dx)(e\sec}{3d}$$

```
[Out] 10/21*I*a^3*(e*sec(d*x+c))^(7/2)/d+2/3*a^3*e*(e*sec(d*x+c))^(5/2)*sin(d*x+c
)/d-2*a^3*e^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin
(1/2*d*x+1/2*c),2^(1/2))/d/cos(d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)+2*a^3*e^3*
sin(d*x+c)*(e*sec(d*x+c))^(1/2)/d+2/11*I*a*(e*sec(d*x+c))^(7/2)*(a+I*a*tan(
d*x+c))^2/d+10/33*I*(e*sec(d*x+c))^(7/2)*(a^3+I*a^3*tan(d*x+c))/d
```

Rubi [A] time = 0.20, antiderivative size = 202, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {3498, 3486, 3768, 3771, 2639}

$$\frac{2a^3e^3\sin(c+dx)\sqrt{e\sec(c+dx)}}{d}-\frac{2a^3e^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{10ia^3(e\sec(c+dx))^{7/2}}{21d}+\frac{2a^3e\sin(c+dx)(e\sec(}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(7/2)*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (-2*a^3*e^4*EllipticE[(c + d*x)/2, 2])/(d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c +
 d*x]]) + (((10*I)/21)*a^3*(e*Sec[c + d*x])^(7/2))/d + (2*a^3*e^3*Sqrt[e*Se
c[c + d*x]]*Sin[c + d*x])/d + (2*a^3*e*(e*Sec[c + d*x])^(5/2)*Sin[c + d*x])
/(3*d) + (((2*I)/11)*a*(e*Sec[c + d*x])^(7/2)*(a + I*a*Tan[c + d*x])^2)/d +
 (((10*I)/33)*(e*Sec[c + d*x])^(7/2)*(a^3 + I*a^3*Tan[c + d*x]))/d
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

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

Rule 3498

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

Rule 3768

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int (e\sec(c+dx))^{7/2}(a+ia\tan(c+dx))^3\,dx = \frac{2ia(e\sec(c+dx))^{7/2}(a+ia\tan(c+dx))^2}{11d}+\frac{1}{11}(15a)\int (e\sec(c+$$

$$= \frac{2ia(e\sec(c+dx))^{7/2}(a+ia\tan(c+dx))^2}{11d}+\frac{10i(e\sec(c+dx))^{7/2}}{3}$$

$$= \frac{10ia^3(e\sec(c+dx))^{7/2}}{21d}+\frac{2ia(e\sec(c+dx))^{7/2}(a+ia\tan(c+dx)}{11d}$$

$$= \frac{10ia^3(e\sec(c+dx))^{7/2}}{21d}+\frac{2a^3e(e\sec(c+dx))^{5/2}\sin(c+dx)}{3d}+\frac{2ia}{}$$

$$= \frac{10ia^3(e\sec(c+dx))^{7/2}}{21d}+\frac{2a^3e^3\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{d}+\frac{2a^3}{}$$

$$= \frac{10ia^3(e\sec(c+dx))^{7/2}}{21d}+\frac{2a^3e^3\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{d}+\frac{2a^3}{}$$

$$= -\frac{2a^3e^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}\,\sqrt{e\sec(c+dx)}}+\frac{10ia^3(e\sec(c+dx))^{7/2}}{21d}+\frac{2a^3e}{}$$

Mathematica [C] time = 7.85, size = 442, normalized size = 2.19

$$\frac{2i\sqrt{2}\,e^{-i(2c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\,\sqrt{1+e^{2i(c+dx)}}\left(\left(-1+e^{2ic}\right)e^{2idx}\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)-3\sqrt{1+e^{2i(c+dx)}}\right)(a+ia\tan(}{3\left(-1+e^{2ic}\right)d\sec^{\frac{13}{2}}(c+dx)(\cos(dx)+i\sin(dx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(7/2)*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (((2*I)/3)*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x)))]*Sqrt[1 +
 E^((2*I)*(c + d*x))]*(-3*Sqrt[1 + E^((2*I)*(c + d*x))] + E^((2*I)*d*x)*(-1
 + E^((2*I)*c))*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x))])*(e*
Sec[c + d*x])^(7/2)*(a + I*a*Tan[c + d*x])^3)/(d*E^(I*(2*c + d*x))*(-1 + E^
((2*I)*c))*Sec[c + d*x]^(13/2)*(Cos[d*x] + I*Sin[d*x])^3) + (Cos[c + d*x]^6
*(e*Sec[c + d*x])^(7/2)*(Sec[c + d*x]^5*(((-2*I)/11)*Cos[3*c] - (2*Sin[3*c]
)/11) + Cos[d*x]*Csc[c]*(2*Cos[3*c] - (2*I)*Sin[3*c]) + Sec[c]*Sec[c + d*x]
^3*(12*Cos[c] + (7*I)*Sin[c])*(((2*I)/21)*Cos[3*c] + (2*Sin[3*c])/21) + Sec
[c]*Sec[c + d*x]^2*((2*Cos[3*c])/3 - ((2*I)/3)*Sin[3*c])*Sin[d*x] + Sec[c]*
Sec[c + d*x]^4*((-2*Cos[3*c])/3 + ((2*I)/3)*Sin[3*c])*Sin[d*x] + Sec[c + d*
x]*((2*Cos[3*c])/3 - ((2*I)/3)*Sin[3*c])*Tan[c])*(a + I*a*Tan[c + d*x])^3)/
(d*(Cos[d*x] + I*Sin[d*x])^3)
```

fricas [F] time = 0.52, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-462i\,a^3e^3e^{(11i\,dx+11i\,c)}-2618i\,a^3e^3e^{(9i\,dx+9i\,c)}-1892i\,a^3e^3e^{(7i\,dx+7i\,c)}-1740i\,a^3e^3e^{(5i\,dx+5i\,c)}-814i\,a^3e^3e^{(3i\,dx}\right.}{231\left(de^{(1}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/2)*(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/231*(sqrt(2)*(-462*I*a^3*e^3*e^(11*I*d*x + 11*I*c) - 2618*I*a^3*e^3*e^(9*
I*d*x + 9*I*c) - 1892*I*a^3*e^3*e^(7*I*d*x + 7*I*c) - 1740*I*a^3*e^3*e^(5*I
*d*x + 5*I*c) - 814*I*a^3*e^3*e^(3*I*d*x + 3*I*c) - 154*I*a^3*e^3*e^(I*d*x
+ I*c))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 231*(d*
e^(10*I*d*x + 10*I*c) + 5*d*e^(8*I*d*x + 8*I*c) + 10*d*e^(6*I*d*x + 6*I*c)
+ 10*d*e^(4*I*d*x + 4*I*c) + 5*d*e^(2*I*d*x + 2*I*c) + d)*integral(I*sqrt(2
)*a^3*e^3*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/d, x))/
(d*e^(10*I*d*x + 10*I*c) + 5*d*e^(8*I*d*x + 8*I*c) + 10*d*e^(6*I*d*x + 6*I*
c) + 10*d*e^(4*I*d*x + 4*I*c) + 5*d*e^(2*I*d*x + 2*I*c) + d)
```

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

$$\int (e \sec (dx + c))^{\frac{7}{2}} (i a \tan (dx + c) + a)^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/2)*(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(7/2)*(I*a*tan(d*x + c) + a)^3, x)
```

maple [A] time = 1.09, size = 402, normalized size = 1.99

$$-\frac{2a^3 (1 + \cos (dx + c))^2 (-1 + \cos (dx + c))^2 \left(231i \left(\cos^6 (dx + c)\right) \sqrt{\frac{1}{1+\cos(dx+c)}} \sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}} \text{EllipticF}\left(\frac{i(-1+\cos(dx}{\sin(dx+c}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(7/2)*(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] -2/231*a^3/d*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(231*I*cos(d*x+c)^6*(1/(1+c
os(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x
+c))/sin(d*x+c),I)*sin(d*x+c)-231*I*cos(d*x+c)^6*(1/(1+cos(d*x+c)))^(1/2)*(
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*
sin(d*x+c)+231*I*cos(d*x+c)^5*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d
*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(d*x+c)-231*I*co
s(d*x+c)^5*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Ellip
ticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(d*x+c)+231*cos(d*x+c)^6-154*cos(d*
x+c)^5-132*I*cos(d*x+c)^2*sin(d*x+c)-154*cos(d*x+c)^3+21*I*sin(d*x+c)+77*co
s(d*x+c))*(e/cos(d*x+c))^(7/2)/cos(d*x+c)^2/sin(d*x+c)^5
```

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

$$\int (e \sec (dx + c))^{\frac{7}{2}} (i a \tan (dx + c) + a)^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/2)*(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] integrate((e*sec(d*x + c))^(7/2)*(I*a*tan(d*x + c) + a)^3, x)
```

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

$$\int \left(\frac{e}{\cos (c + d\,x)}\right)^{7/2} (a + a \tan (c + d\,x)\,1\mathrm{i})^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(7/2)*(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] int((e/cos(c + d*x))^(7/2)*(a + a*tan(c + d*x)*1i)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(7/2)*(a+I*a*tan(d*x+c))**3,x)
[Out] Timed out
```

3.202 $\int (e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))^3\,dx$

Optimal. Leaf size=175

$$\frac{26a^3e^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{21d}+\frac{26ia^3(e\sec(c+dx))^{5/2}}{35d}+\frac{26a^3e\sin(c+dx)(e\sec(c+dx))^{3/2}}{21d}$$

```
[Out] 26/35*I*a^3*(e*sec(d*x+c))^(5/2)/d+26/21*a^3*e*(e*sec(d*x+c))^(3/2)*sin(d*x
+c)/d+26/21*a^3*e^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipti
cF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(d*x+c))^(1/2)/d+2/9*
I*a*(e*sec(d*x+c))^(5/2)*(a+I*a*tan(d*x+c))^2/d+26/63*I*(e*sec(d*x+c))^(5/2
)*(a^3+I*a^3*tan(d*x+c))/d
```

Rubi [A] time = 0.19, antiderivative size = 175, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {3498, 3486, 3768, 3771, 2641}

$$\frac{26a^3e^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{21d}+\frac{26ia^3(e\sec(c+dx))^{5/2}}{35d}+\frac{26a^3e\sin(c+dx)(e\sec(c+dx))^{3/2}}{21d}$$

Antiderivative was successfully verified.

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

```
[Out] (26*a^3*e^2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x
]])/(21*d) + (((26*I)/35)*a^3*(e*Sec[c + d*x])^(5/2))/d + (26*a^3*e*(e*Sec[
c + d*x])^(3/2)*Sin[c + d*x])/(21*d) + (((2*I)/9)*a*(e*Sec[c + d*x])^(5/2)*
(a + I*a*Tan[c + d*x])^2)/d + (((26*I)/63)*(e*Sec[c + d*x])^(5/2)*(a^3 + I*
a^3*Tan[c + d*x]))/d
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

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

Rule 3498

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

Rule 3768

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int (e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))^3\,dx = \frac{2ia(e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))^2}{9d}+\frac{1}{9}(13a)\int (e\sec(c+$$
$$=\frac{2ia(e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))^2}{9d}+\frac{26i(e\sec(c+dx))^{5/2}}{6}$$
$$=\frac{26ia^3(e\sec(c+dx))^{5/2}}{35d}+\frac{2ia(e\sec(c+dx))^{5/2}(a+ia\tan(c+dx)}{9d}$$
$$=\frac{26ia^3(e\sec(c+dx))^{5/2}}{35d}+\frac{26a^3e(e\sec(c+dx))^{3/2}\sin(c+dx)}{21d}+\frac{2}{}$$
$$=\frac{26ia^3(e\sec(c+dx))^{5/2}}{35d}+\frac{26a^3e(e\sec(c+dx))^{3/2}\sin(c+dx)}{21d}+\frac{2}{}$$
$$=\frac{26a^3e^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{21d}+\frac{26ia^3(e\,\mathrm{s}}{}$$

Mathematica [A] time = 1.93, size = 89, normalized size = 0.51

$$\frac{a^3\sec^2(c+dx)(e\sec(c+dx))^{5/2}\left(-150\sin(2(c+dx))+195\sin(4(c+dx))+1008i\cos(2(c+dx))+1560\cos^{\frac{9}{2}}\right.}{1260d}$$

Antiderivative was successfully verified.

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

```
[Out] (a^3*Sec[c + d*x]^2*(e*Sec[c + d*x])^(5/2)*(728*I + (1008*I)*Cos[2*(c + d*x
)] + 1560*Cos[c + d*x]^(9/2)*EllipticF[(c + d*x)/2, 2] - 150*Sin[2*(c + d*x
)] + 195*Sin[4*(c + d*x)]))/(1260*d)
```

fricas [F] time = 0.69, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-390i\,a^3e^2e^{(8i\,dx+8i\,c)}+2316i\,a^3e^2e^{(6i\,dx+6i\,c)}+2912i\,a^3e^2e^{(4i\,dx+4i\,c)}+1716i\,a^3e^2e^{(2i\,dx+2i\,c)}+390i\,a^3e^2\right)\sqrt{\frac{}{e^{(2i}}}}{315\left(de^{(8i\,dx+8i\,c)}+4\,d\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/315*(sqrt(2)*(-390*I*a^3*e^2*e^(8*I*d*x + 8*I*c) + 2316*I*a^3*e^2*e^(6*I*
d*x + 6*I*c) + 2912*I*a^3*e^2*e^(4*I*d*x + 4*I*c) + 1716*I*a^3*e^2*e^(2*I*d
*x + 2*I*c) + 390*I*a^3*e^2)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x
 + 1/2*I*c) + 315*(d*e^(8*I*d*x + 8*I*c) + 4*d*e^(6*I*d*x + 6*I*c) + 6*d*e^
(4*I*d*x + 4*I*c) + 4*d*e^(2*I*d*x + 2*I*c) + d)*integral(-13/21*I*sqrt(2)*
a^3*e^2*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/d, x))/(
d*e^(8*I*d*x + 8*I*c) + 4*d*e^(6*I*d*x + 6*I*c) + 6*d*e^(4*I*d*x + 4*I*c) +
 4*d*e^(2*I*d*x + 2*I*c) + d)
```

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

$$\int (e\sec(dx+c))^{\frac{5}{2}}(i\,a\tan(dx+c)+a)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [A] time = 1.03, size = 229, normalized size = 1.31

$$2a^3(1+\cos(dx+c))^2(-1+\cos(dx+c))^2\left(195i\,\mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)\left(\cos^5(dx+c)\right)\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(d}{1+\cos(}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/315*a^3/d*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(195*I*EllipticF(I*(-1+cos(d
*x+c))/sin(d*x+c),I)*cos(d*x+c)^5*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)+195*I*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c
)^4*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+195*cos(d*x+
c)^3*sin(d*x+c)+252*I*cos(d*x+c)^2-135*cos(d*x+c)*sin(d*x+c)-35*I)*(e/cos(d
*x+c))^(5/2)/cos(d*x+c)^2/sin(d*x+c)^4
```

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

$$\int(e\sec(dx+c))^{\frac{5}{2}}(i\,a\tan(dx+c)+a)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\left(\frac{e}{\cos(c+d\,x)}\right)^{5/2}(a+a\tan(c+d\,x)\,1\mathrm{i})^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(5/2)*(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] int((e/cos(c + d*x))^(5/2)*(a + a*tan(c + d*x)*1i)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] Timed out
```

3.203 $\int (e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^3\,dx$

Optimal. Leaf size=175

$$-\frac{22a^3e^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{22ia^3(e\sec(c+dx))^{3/2}}{15d}+\frac{22a^3e\sin(c+dx)\sqrt{e\sec(c+dx)}}{5d}+\frac{22i\left(a^3+ia^3\tan\right.}{}$$

```
[Out] 22/15*I*a^3*(e*sec(d*x+c))^(3/2)/d-22/5*a^3*e^2*(cos(1/2*d*x+1/2*c)^2)^(1/2
)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/d/cos(d*x+c)^(1/
2)/(e*sec(d*x+c))^(1/2)+22/5*a^3*e*sin(d*x+c)*(e*sec(d*x+c))^(1/2)/d+2/7*I*
a*(e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^2/d+22/35*I*(e*sec(d*x+c))^(3/2)*
(a^3+I*a^3*tan(d*x+c))/d
```

Rubi [A] time = 0.19, antiderivative size = 175, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {3498, 3486, 3768, 3771, 2639}

$$-\frac{22a^3e^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{22ia^3(e\sec(c+dx))^{3/2}}{15d}+\frac{22a^3e\sin(c+dx)\sqrt{e\sec(c+dx)}}{5d}+\frac{22i\left(a^3+ia^3\tan\right.}{}$$

Antiderivative was successfully verified.

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

```
[Out] (-22*a^3*e^2*EllipticE[(c + d*x)/2, 2])/(5*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[
c + d*x]]) + (((22*I)/15)*a^3*(e*Sec[c + d*x])^(3/2))/d + (22*a^3*e*Sqrt[e*
Sec[c + d*x]]*Sin[c + d*x])/(5*d) + (((2*I)/7)*a*(e*Sec[c + d*x])^(3/2)*(a
+ I*a*Tan[c + d*x])^2)/d + (((22*I)/35)*(e*Sec[c + d*x])^(3/2)*(a^3 + I*a^3
*Tan[c + d*x]))/d
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

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

Rule 3498

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

Rule 3768

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int (e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^3\,dx = \frac{2ia(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^2}{7d}+\frac{1}{7}(11a)\int (e\sec(c+dx)$$

$$= \frac{2ia(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^2}{7d}+\frac{22i(e\sec(c+dx))^{3/2}\left(a^3\right.}{35d}$$

$$= \frac{22ia^3(e\sec(c+dx))^{3/2}}{15d}+\frac{2ia(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^2}{7d}$$

$$= \frac{22ia^3(e\sec(c+dx))^{3/2}}{15d}+\frac{22a^3e\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5d}+\frac{2ia(e\mathrm{s}}{}$$

$$= \frac{22ia^3(e\sec(c+dx))^{3/2}}{15d}+\frac{22a^3e\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5d}+\frac{2ia(e\mathrm{s}}{}$$

$$= -\frac{22a^3e^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{22ia^3(e\sec(c+dx))^{3/2}}{15d}+\frac{22a^3e}{}$$

Mathematica [C] time = 2.73, size = 129, normalized size = 0.74

$$\frac{a^3(1+i\tan(c+dx))(e\sec(c+dx))^{3/2}\left(77ie^{-2i(c+dx)}\left(1+e^{2i(c+dx)}\right)^{5/2}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)-308i\cos(2(c+dx))\right.}{210d}$$

Antiderivative was successfully verified.

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

```
[Out] (a^3*(e*Sec[c + d*x])^(3/2)*(1 + I*Tan[c + d*x])*(-116*I - (308*I)*Cos[2*(c
 + d*x)] + ((77*I)*(1 + E^((2*I)*(c + d*x)))^(5/2)*Hypergeometric2F1[1/2, 3
/4, 7/4, -E^((2*I)*(c + d*x))])/E^((2*I)*(c + d*x)) + 77*Sec[c + d*x]*Sin[3
*(c + d*x)] + 17*Tan[c + d*x]))/(210*d)
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-462i\,a^3ee^{(7i\,dx+7i\,c)}-574i\,a^3ee^{(5i\,dx+5i\,c)}-506i\,a^3ee^{(3i\,dx+3i\,c)}-154i\,a^3ee^{(i\,dx+i\,c)}\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+105}{105\left(de^{(6i\,dx+6i\,c)}+3\,de^{(4i\,dx+4i\,c)}+3\,d\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/105*(sqrt(2)*(-462*I*a^3*e*e^(7*I*d*x + 7*I*c) - 574*I*a^3*e*e^(5*I*d*x +
 5*I*c) - 506*I*a^3*e*e^(3*I*d*x + 3*I*c) - 154*I*a^3*e*e^(I*d*x + I*c))*sq
rt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 105*(d*e^(6*I*d*x
 + 6*I*c) + 3*d*e^(4*I*d*x + 4*I*c) + 3*d*e^(2*I*d*x + 2*I*c) + d)*integral
(11/5*I*sqrt(2)*a^3*e*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*
I*c)/d, x))/(d*e^(6*I*d*x + 6*I*c) + 3*d*e^(4*I*d*x + 4*I*c) + 3*d*e^(2*I*d
*x + 2*I*c) + d)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [B] time = 0.99, size = 392, normalized size = 2.24

$$2a^3(1+\cos(dx+c))^2(-1+\cos(dx+c))^2\left(231i\left(\cos^4(dx+c)\right)\sin(dx+c)\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \text{Ellipt}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 2/105*a^3/d*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(231*I*cos(d*x+c)^4*sin(d*x+
c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(
-1+cos(d*x+c))/sin(d*x+c),I)-231*I*cos(d*x+c)^4*sin(d*x+c)*(1/(1+cos(d*x+c)
))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(
d*x+c),I)+231*I*cos(d*x+c)^3*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)-231*I*cos
(d*x+c)^3*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(
1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)+140*I*cos(d*x+c)^2*sin(d*x+c
)-231*cos(d*x+c)^4+294*cos(d*x+c)^3-15*I*sin(d*x+c)-63*cos(d*x+c))*(e/cos(d
*x+c))^(3/2)/cos(d*x+c)^2/sin(d*x+c)^5
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(\frac{e}{\cos(c+d\,x)}\right)^{3/2}(a+a\tan(c+d\,x)\,1\mathrm{i})^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] int((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^3, x)
```

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

$$-ia^3\left(\int i(e\sec(c+dx))^{\frac{3}{2}}\,dx+\int\left(-3(e\sec(c+dx))^{\frac{3}{2}}\tan(c+dx)\right)dx+\int(e\sec(c+dx))^{\frac{3}{2}}\tan^3(c+dx)\,dx\right.$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.204 $\int \sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^3\,dx$

Optimal. Leaf size=139

$$\frac{6ia^3\sqrt{e\sec(c+dx)}}{d}+\frac{6i\left(a^3+ia^3\tan(c+dx)\right)\sqrt{e\sec(c+dx)}}{5d}+\frac{6a^3\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{d}+$$

```
[Out] 6*I*a^3*(e*sec(d*x+c))^(1/2)/d+6*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d
*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(d*x
+c))^(1/2)/d+2/5*I*a*(e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^2/d+6/5*I*(e*s
ec(d*x+c))^(1/2)*(a^3+I*a^3*tan(d*x+c))/d
```

Rubi [A] time = 0.14, antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {3498, 3486, 3771, 2641}

$$\frac{6ia^3\sqrt{e\sec(c+dx)}}{d}+\frac{6i\left(a^3+ia^3\tan(c+dx)\right)\sqrt{e\sec(c+dx)}}{5d}+\frac{6a^3\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{d}+$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] ((6*I)*a^3*Sqrt[e*Sec[c + d*x]])/d + (6*a^3*Sqrt[Cos[c + d*x]]*EllipticF[(c
 + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/d + (((2*I)/5)*a*Sqrt[e*Sec[c + d*x]]*(
a + I*a*Tan[c + d*x])^2)/d + (((6*I)/5)*Sqrt[e*Sec[c + d*x]]*(a^3 + I*a^3*T
an[c + d*x]))/d
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

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

Rule 3498

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^3\,dx = \frac{2ia\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^2}{5d} + \frac{1}{5}(9a)\int \sqrt{e\sec(c+dx)}$$
$$= \frac{2ia\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^2}{5d} + \frac{6i\sqrt{e\sec(c+dx)}\,\left(a^3+\right.}{5d}$$
$$= \frac{6ia^3\sqrt{e\sec(c+dx)}}{d} + \frac{2ia\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^2}{5d} + \frac{6}{}$$
$$= \frac{6ia^3\sqrt{e\sec(c+dx)}}{d} + \frac{2ia\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^2}{5d} + \frac{6}{}$$
$$= \frac{6ia^3\sqrt{e\sec(c+dx)}}{d} + \frac{6a^3\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c}}{d}$$

Mathematica [A] time = 1.45, size = 79, normalized size = 0.57

$$\frac{a^3\sec^2(c+dx)\sqrt{e\sec(c+dx)}\,\left(-5\sin(2(c+dx))+20i\cos(2(c+dx))+30\cos^{\frac{5}{2}}(c+dx)F\left(\frac{1}{2}(c+dx)\middle|2\right)+18i\right.}{5d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (a^3*Sec[c + d*x]^2*Sqrt[e*Sec[c + d*x]]*(18*I + (20*I)*Cos[2*(c + d*x)] +
30*Cos[c + d*x]^(5/2)*EllipticF[(c + d*x)/2, 2] - 5*Sin[2*(c + d*x)]))/(5*d
)
```

fricas [F] time = 0.54, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(50i\,a^3e^{(4i\,dx+4i\,c)}+72i\,a^3e^{(2i\,dx+2i\,c)}+30i\,a^3\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+5\left(de^{(4i\,dx+4i\,c)}+2\,de^{(2i\,dx+2i\,c)}+d\right)\mathrm{in}}{5\left(de^{(4i\,dx+4i\,c)}+2\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/5*(sqrt(2)*(50*I*a^3*e^(4*I*d*x + 4*I*c) + 72*I*a^3*e^(2*I*d*x + 2*I*c) +
 30*I*a^3)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 5*(d
*e^(4*I*d*x + 4*I*c) + 2*d*e^(2*I*d*x + 2*I*c) + d)*integral(-3*I*sqrt(2)*a
^3*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/d, x))/(d*e^(
4*I*d*x + 4*I*c) + 2*d*e^(2*I*d*x + 2*I*c) + d)
```

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

$$\int \sqrt{e\sec\left(dx+c\right)}\left(i\,a\tan\left(dx+c\right)+a\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*sec(d*x + c))*(I*a*tan(d*x + c) + a)^3, x)
```

maple [A] time = 0.98, size = 213, normalized size = 1.53

$$\frac{2a^3\left(1+\cos\left(dx+c\right)\right)^2\left(-1+\cos\left(dx+c\right)\right)^2\left(15i\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)\left(\cos^3\left(d\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 2/5*a^3/d*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(15*I*(1/(1+cos(d*x+c)))^(1/2)
*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I
)*cos(d*x+c)^3+15*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)^2+20*I*cos(d*x+c)^
2-5*cos(d*x+c)*sin(d*x+c)-I)*(e/cos(d*x+c))^(1/2)/cos(d*x+c)^2/sin(d*x+c)^4
```

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

$$\int \sqrt{e \sec\left(dx + c\right)} {\left(i \, a \tan\left(dx + c\right) + a\right)}^{3}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(e*sec(d*x + c))*(I*a*tan(d*x + c) + a)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \sqrt{\frac{e}{\cos\left(c+d\,x\right)}}\,{\left(a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] int((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^3, x)
```

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

$$- i a^{3} \left(\int i \sqrt{e \sec{\left(c + d x \right)}}\, dx + \int \left(- 3 \sqrt{e \sec{\left(c + d x \right)}} \tan{\left(c + d x \right)}\right)\, dx + \int \sqrt{e \sec{\left(c + d x \right)}} \tan^{3}{\left(c + d x \right)}\, dx + \int \left(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(1/2)*(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] -I*a**3*(Integral(I*sqrt(e*sec(c + d*x)), x) + Integral(-3*sqrt(e*sec(c + d
*x))*tan(c + d*x), x) + Integral(sqrt(e*sec(c + d*x))*tan(c + d*x)**3, x) +
 Integral(-3*I*sqrt(e*sec(c + d*x))*tan(c + d*x)**2, x))
```

3.205 $\int \frac{(a+ia\tan(c+dx))^3}{\sqrt{e\sec(c+dx)}}\,dx$

Optimal. Leaf size=124

$$-\frac{26ia^3}{3d\sqrt{e\sec(c+dx)}}-\frac{2ia^3\tan^2(c+dx)}{3d\sqrt{e\sec(c+dx)}}-\frac{6a^3\tan(c+dx)}{d\sqrt{e\sec(c+dx)}}+\frac{14a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}$$

```
[Out] -26/3*I*a^3/d/(e*sec(d*x+c))^(1/2)+14*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(
1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/d/cos(d*x+c)^(1/2)/(e*
sec(d*x+c))^(1/2)-6*a^3*tan(d*x+c)/d/(e*sec(d*x+c))^(1/2)-2/3*I*a^3*tan(d*x
+c)^2/d/(e*sec(d*x+c))^(1/2)
```

Rubi [A] time = 0.13, antiderivative size = 146, normalized size of antiderivative = 1.18, number of steps used = 5, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {3498, 3496, 3768, 3771, 2639}

$$-\frac{14a^3\sin(c+dx)\sqrt{e\sec(c+dx)}}{de}-\frac{28i\left(a^3+ia^3\tan(c+dx)\right)}{3d\sqrt{e\sec(c+dx)}}+\frac{14a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{2ia(a+ia\tan(c}{3d\sqrt{e\sec(c}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^3/Sqrt[e*Sec[c + d*x]],x]
```

```
[Out] (14*a^3*EllipticE[(c + d*x)/2, 2])/(d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c + d*x
]]) - (14*a^3*Sqrt[e*Sec[c + d*x]]*Sin[c + d*x])/(d*e) + (((2*I)/3)*a*(a +
I*a*Tan[c + d*x])^2)/(d*Sqrt[e*Sec[c + d*x]]) - (((28*I)/3)*(a^3 + I*a^3*Ta
n[c + d*x]))/(d*Sqrt[e*Sec[c + d*x]])
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3498

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

Rule 3768

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

```
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^3}{\sqrt{e\sec(c+dx)}}\,dx = \frac{2ia(a+ia\tan(c+dx))^2}{3d\sqrt{e\sec(c+dx)}} + \frac{1}{3}(7a)\int \frac{(a+ia\tan(c+dx))^2}{\sqrt{e\sec(c+dx)}}\,dx$$
$$= \frac{2ia(a+ia\tan(c+dx))^2}{3d\sqrt{e\sec(c+dx)}} - \frac{28i\left(a^3+ia^3\tan(c+dx)\right)}{3d\sqrt{e\sec(c+dx)}} - \frac{\left(7a^3\right)\int (e\sec(c+dx))^{3/2}\,dx}{e^2}$$
$$= -\frac{14a^3\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{de} + \frac{2ia(a+ia\tan(c+dx))^2}{3d\sqrt{e\sec(c+dx)}} - \frac{28i\left(a^3+ia^3\tan(c+\right.}{3d\sqrt{e\sec(c+dx}}$$
$$= -\frac{14a^3\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{de} + \frac{2ia(a+ia\tan(c+dx))^2}{3d\sqrt{e\sec(c+dx)}} - \frac{28i\left(a^3+ia^3\tan(c+\right.}{3d\sqrt{e\sec(c+dx}}$$
$$= \frac{14a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} - \frac{14a^3\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{de} + \frac{2ia(a+ia\tan(c}{3d\sqrt{e\sec(c-}}$$

Mathematica [C] time = 1.81, size = 101, normalized size = 0.81

$$\frac{2a^3(\cos(c)+i\sin(c))(\sin(dx)-i\cos(dx))\sqrt{e\sec(c+dx)}\left(7\sqrt{1+e^{2i(c+dx)}}\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)-i\tan(c+dx)-\right.}{3de}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^3/Sqrt[e*Sec[c + d*x]],x]
```

```
[Out] (2*a^3*Sqrt[e*Sec[c + d*x]]*(Cos[c] + I*Sin[c])*((-I)*Cos[d*x] + Sin[d*x])*
(-8 + 7*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/2, 3/4, 7/4, -E^(
(2*I)*(c + d*x))] - I*Tan[c + d*x]))/(3*d*e)
```

fricas [F] time = 0.82, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-24i\,a^3e^{(4i\,dx+4i\,c)}-18i\,a^3e^{(3i\,dx+3i\,c)}-70i\,a^3e^{(2i\,dx+2i\,c)}-14i\,a^3e^{(i\,dx+i\,c)}-42i\,a^3\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+3\left(d\right.}{3\left(dee^{(3i\,dx+3i\,c)}-dee^{(2i\,dx\cdot}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/3*(sqrt(2)*(-24*I*a^3*e^(4*I*d*x + 4*I*c) - 18*I*a^3*e^(3*I*d*x + 3*I*c)
- 70*I*a^3*e^(2*I*d*x + 2*I*c) - 14*I*a^3*e^(I*d*x + I*c) - 42*I*a^3)*sqrt(
e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 3*(d*e*e^(3*I*d*x +
3*I*c) - d*e*e^(2*I*d*x + 2*I*c) + d*e*e^(I*d*x + I*c) - d*e)*integral(sqrt
(2)*(-7*I*a^3*e^(2*I*d*x + 2*I*c) - 14*I*a^3*e^(I*d*x + I*c) - 7*I*a^3)*sqr
t(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(d*e*e^(3*I*d*x + 3*
I*c) - 2*d*e*e^(2*I*d*x + 2*I*c) + d*e*e^(I*d*x + I*c)), x))/(d*e*e^(3*I*d*
x + 3*I*c) - d*e*e^(2*I*d*x + 2*I*c) + d*e*e^(I*d*x + I*c) - d*e)
```

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

$$\int \frac{(i a \tan(dx + c) + a)^3}{\sqrt{e \sec(dx + c)}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^3/sqrt(e*sec(d*x + c)), x)
```

maple [B] time = 1.02, size = 1564, normalized size = 12.61

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(1/2),x)
```

```
[Out] -2/3*a^3/d*(-1+cos(d*x+c))^2*(-126*I*cos(d*x+c)^3*sin(d*x+c)*(-cos(d*x+c)/(
1+cos(d*x+c))^2)^(3/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-3*I*cos(d*x+c)^3*sin(d*x+c
)*ln(-(2*cos(d*x+c)^2*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)-cos(d*x+c)^2+2*c
os(d*x+c)-2*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)-1)/sin(d*x+c)^2)-21*I*cos(
d*x+c)^5*sin(d*x+c)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*(1/(1+cos(d*x+c)))
^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*
x+c),I)+84*I*cos(d*x+c)^2*sin(d*x+c)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*(
1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+c
os(d*x+c))/sin(d*x+c),I)+37*I*cos(d*x+c)^3*sin(d*x+c)*(-cos(d*x+c)/(1+cos(d
*x+c))^2)^(3/2)+3*I*cos(d*x+c)^3*sin(d*x+c)*ln(-2*(2*cos(d*x+c)^2*(-cos(d*x
+c)/(1+cos(d*x+c))^2)^(1/2)-cos(d*x+c)^2+2*cos(d*x+c)-2*(-cos(d*x+c)/(1+cos
(d*x+c))^2)^(1/2)-1)/sin(d*x+c)^2)+21*I*cos(d*x+c)*sin(d*x+c)*(-cos(d*x+c)/
(1+cos(d*x+c))^2)^(3/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)-84*I*cos(d*x+c)^4*sin(d*x
+c)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)+126*I*co
s(d*x+c)^3*sin(d*x+c)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*(1/(1+cos(d*x+c)
))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(
d*x+c),I)+21*I*cos(d*x+c)^5*sin(d*x+c)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)
*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1
+cos(d*x+c))/sin(d*x+c),I)-21*I*cos(d*x+c)*sin(d*x+c)*(-cos(d*x+c)/(1+cos(d
*x+c))^2)^(3/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*
EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)+I*(-cos(d*x+c)/(1+cos(d*x+c))^2)^
(3/2)*sin(d*x+c)+12*cos(d*x+c)^6*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)+12*I*
cos(d*x+c)^5*sin(d*x+c)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)+15*cos(d*x+c)^
5*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)+84*I*cos(d*x+c)^4*sin(d*x+c)*(-cos(d
*x+c)/(1+cos(d*x+c))^2)^(3/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d
*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)-18*cos(d*x+c)^4*(-c
os(d*x+c)/(1+cos(d*x+c))^2)^(3/2)+3*I*cos(d*x+c)*sin(d*x+c)*(-cos(d*x+c)/(1
+cos(d*x+c))^2)^(3/2)+36*I*cos(d*x+c)^4*sin(d*x+c)*(-cos(d*x+c)/(1+cos(d*x+
c))^2)^(3/2)-84*I*cos(d*x+c)^2*sin(d*x+c)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3
/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*
(-1+cos(d*x+c))/sin(d*x+c),I)-24*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*cos(d
*x+c)^3+15*I*cos(d*x+c)^2*sin(d*x+c)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)+6
*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*cos(d*x+c)^2+9*cos(d*x+c)*(-cos(d*x+c
)/(1+cos(d*x+c))^2)^(3/2))/(1+cos(d*x+c))/cos(d*x+c)^2/sin(d*x+c)^5/(e/cos(
d*x+c))^(1/2)/(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)
```

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

$$\int \frac{(i a \tan(dx + c) + a)^3}{\sqrt{e \sec(dx + c)}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^3/sqrt(e*sec(d*x + c)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a + a\tan(c + d\,x)\,1\mathrm{i})^3}{\sqrt{\frac{e}{\cos(c+d\,x)}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^3/(e/cos(c + d*x))^(1/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^3/(e/cos(c + d*x))^(1/2), x)
```

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

$$-ia^3\left(\int \frac{i}{\sqrt{e\sec(c+dx)}}\,dx + \int\left(-\frac{3\tan(c+dx)}{\sqrt{e\sec(c+dx)}}\right)dx + \int \frac{\tan^3(c+dx)}{\sqrt{e\sec(c+dx)}}\,dx + \int\left(-\frac{3i\tan^2(c+dx)}{\sqrt{e\sec(c+dx)}}\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**3/(e*sec(d*x+c))**(1/2),x)
```

```
[Out] -I*a**3*(Integral(I/sqrt(e*sec(c + d*x)), x) + Integral(-3*tan(c + d*x)/sqr
t(e*sec(c + d*x)), x) + Integral(tan(c + d*x)**3/sqrt(e*sec(c + d*x)), x) +
 Integral(-3*I*tan(c + d*x)**2/sqrt(e*sec(c + d*x)), x))
```

3.206 $\int \frac{(a+ia\tan(c+dx))^3}{(e\sec(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=111

$$-\frac{10ia^3\sqrt{e\sec(c+dx)}}{3de^2}-\frac{10a^3\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3de^2}-\frac{4ia(a+ia\tan(c+dx))^2}{3d(e\sec(c+dx))^{3/2}}$$

```
[Out] -10/3*I*a^3*(e*sec(d*x+c))^(1/2)/d/e^2-10/3*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2
)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)
*(e*sec(d*x+c))^(1/2)/d/e^2-4/3*I*a*(a+I*a*tan(d*x+c))^2/d/(e*sec(d*x+c))^(
3/2)
```

Rubi [A] time = 0.10, antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {3496, 3486, 3771, 2641}

$$-\frac{10ia^3\sqrt{e\sec(c+dx)}}{3de^2}-\frac{10a^3\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3de^2}-\frac{4ia(a+ia\tan(c+dx))^2}{3d(e\sec(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

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

```
[Out] (((-10*I)/3)*a^3*Sqrt[e*Sec[c + d*x]])/(d*e^2) - (10*a^3*Sqrt[Cos[c + d*x]]
*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(3*d*e^2) - (((4*I)/3)*a*(
a + I*a*Tan[c + d*x])^2)/(d*(e*Sec[c + d*x])^(3/2))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

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

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^3}{(e\sec(c+dx))^{3/2}}\,dx = -\frac{4ia(a+ia\tan(c+dx))^2}{3d(e\sec(c+dx))^{3/2}} - \frac{(5a^2)\int\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))\,dx}{3e^2}$$

$$= -\frac{10ia^3\sqrt{e\sec(c+dx)}}{3de^2} - \frac{4ia(a+ia\tan(c+dx))^2}{3d(e\sec(c+dx))^{3/2}} - \frac{(5a^3)\int\sqrt{e\sec(c+dx)}\,dx}{3e^2}$$

$$= -\frac{10ia^3\sqrt{e\sec(c+dx)}}{3de^2} - \frac{4ia(a+ia\tan(c+dx))^2}{3d(e\sec(c+dx))^{3/2}} - \frac{(5a^3\sqrt{\cos(c+dx)}\sqrt{e\sec(c+d}}{3e^2}$$

$$= -\frac{10ia^3\sqrt{e\sec(c+dx)}}{3de^2} - \frac{10a^3\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3de^2} - \frac{4ia(a}{3d(}$$

Mathematica [A] time = 0.81, size = 123, normalized size = 1.11

$$-\frac{2a^3\sec^2(c+dx)(\cos(c+4dx)+i\sin(c+4dx))\left(3\sin(c+dx)+7i\cos(c+dx)+5\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\right.}{3d(\cos(dx)+i\sin(dx))^3(e\sec(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

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

```
[Out] (-2*a^3*Sec[c + d*x]^2*((7*I)*Cos[c + d*x] + 5*Sqrt[Cos[c + d*x]]*EllipticF
[(c + d*x)/2, 2]*(Cos[c + d*x] - I*Sin[c + d*x]) + 3*Sin[c + d*x])*(Cos[c +
 4*d*x] + I*Sin[c + 4*d*x]))/(3*d*(e*Sec[c + d*x])^(3/2)*(Cos[d*x] + I*Sin[
d*x])^3)
```

fricas [F] time = 0.52, size = 0, normalized size = 0.00

$$\frac{3\,de^2\text{integral}\left(\frac{5i\sqrt{2}\,a^3\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{3\,de^2},x\right)+\sqrt{2}\left(-4i\,a^3e^{(2i\,dx+2i\,c)}-10i\,a^3\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}}{3\,de^2}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/3*(3*d*e^2*integral(5/3*I*sqrt(2)*a^3*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e
^(-1/2*I*d*x - 1/2*I*c)/(d*e^2), x) + sqrt(2)*(-4*I*a^3*e^(2*I*d*x + 2*I*c)
 - 10*I*a^3)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))/(d*
e^2)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [A] time = 0.96, size = 175, normalized size = 1.58

$$-\frac{2a^3\left(5i\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\text{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)\cos(dx+c)+5i\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\text{Ellipti}\right.}{3d\cos(dx+c)^2\left(\frac{e}{\cos(dx+c)}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -2/3*a^3/d*(5*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*
EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)+5*I*(1/(1+cos(d*x+c)))
^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*
x+c),I)+4*I*cos(d*x+c)^2-4*cos(d*x+c)*sin(d*x+c)+3*I)/cos(d*x+c)^2/(e/cos(d
*x+c))^(3/2)
```

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

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

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a + a \tan (c + d\,x)\, 1\mathrm{i})^3}{\left(\frac{e}{\cos(c+d\,x)}\right)^{3/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^3/(e/cos(c + d*x))^(3/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^3/(e/cos(c + d*x))^(3/2), x)
```

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

$$-ia^3 \left(\int \frac{i}{(e \sec (c + dx))^{\frac{3}{2}}}\, dx + \int \left(-\frac{3 \tan (c + dx)}{(e \sec (c + dx))^{\frac{3}{2}}} \right) dx + \int \frac{\tan^3 (c + dx)}{(e \sec (c + dx))^{\frac{3}{2}}}\, dx + \int \left(-\frac{3i \tan^2 (c + dx)}{(e \sec (c + dx))^{\frac{3}{2}}} \right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

3.207 $\int \frac{(a+ia\tan(c+dx))^3}{(e\sec(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=111

$$\frac{6ia^3}{5de^2\sqrt{e\sec(c+dx)}}-\frac{6a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5de^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{4ia(a+ia\tan(c+dx))^2}{5d(e\sec(c+dx))^{5/2}}$$

```
[Out] 6/5*I*a^3/d/e^2/(e*sec(d*x+c))^(1/2)-6/5*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/c
os(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/d/e^2/cos(d*x+c)^(1
/2)/(e*sec(d*x+c))^(1/2)-4/5*I*a*(a+I*a*tan(d*x+c))^2/d/(e*sec(d*x+c))^(5/2
)
```

Rubi [A] time = 0.10, antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3496, 3486, 3771, 2639}

$$\frac{6ia^3}{5de^2\sqrt{e\sec(c+dx)}}-\frac{6a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5de^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{4ia(a+ia\tan(c+dx))^2}{5d(e\sec(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

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

```
[Out] (((6*I)/5)*a^3)/(d*e^2*Sqrt[e*Sec[c + d*x]]) - (6*a^3*EllipticE[(c + d*x)/2
, 2])/(5*d*e^2*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c + d*x]]) - (((4*I)/5)*a*(a +
 I*a*Tan[c + d*x])^2)/(d*(e*Sec[c + d*x])^(5/2))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

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

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^3}{(e\sec(c+dx))^{5/2}}\,dx = -\frac{4ia(a+ia\tan(c+dx))^2}{5d(e\sec(c+dx))^{5/2}} - \frac{(3a^2)\int \frac{a+ia\tan(c+dx)}{\sqrt{e\sec(c+dx)}}\,dx}{5e^2}$$

$$= \frac{6ia^3}{5de^2\sqrt{e\sec(c+dx)}} - \frac{4ia(a+ia\tan(c+dx))^2}{5d(e\sec(c+dx))^{5/2}} - \frac{(3a^3)\int \frac{1}{\sqrt{e\sec(c+dx)}}\,dx}{5e^2}$$

$$= \frac{6ia^3}{5de^2\sqrt{e\sec(c+dx)}} - \frac{4ia(a+ia\tan(c+dx))^2}{5d(e\sec(c+dx))^{5/2}} - \frac{(3a^3)\int \sqrt{\cos(c+dx)}\,dx}{5e^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx}}$$

$$= \frac{6ia^3}{5de^2\sqrt{e\sec(c+dx)}} - \frac{6a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5de^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} - \frac{4ia(a+ia\tan(c+dx}{5d(e\sec(c+dx))^{5/2}}$$

Mathematica [C] time = 1.45, size = 108, normalized size = 0.97

$$-\frac{4ia^3e^{2i(c+dx)}\left(-\sqrt{1+e^{2i(c+dx)}}\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)+e^{2i(c+dx)}+1\right)}{5de^2\left(1+e^{2i(c+dx)}\right)\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

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

```
[Out] (((-4*I)/5)*a^3*E^((2*I)*(c + d*x))*(1 + E^((2*I)*(c + d*x)) - Sqrt[1 + E^(
(2*I)*(c + d*x))]*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x))]))/
(d*e^2*(1 + E^((2*I)*(c + d*x)))*Sqrt[e*Sec[c + d*x]])
```

fricas [F] time = 0.67, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-2i\,a^3e^{(4i\,dx+4i\,c)}+2i\,a^3e^{(3i\,dx+3i\,c)}+4i\,a^3e^{(2i\,dx+2i\,c)}+2i\,a^3e^{(i\,dx+i\,c)}+6i\,a^3\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+5\left(de^3e\right.}{5\left(de^3e^{(i\,dx+i\,c)}-de^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] 1/5*(sqrt(2)*(-2*I*a^3*e^(4*I*d*x + 4*I*c) + 2*I*a^3*e^(3*I*d*x + 3*I*c) +
4*I*a^3*e^(2*I*d*x + 2*I*c) + 2*I*a^3*e^(I*d*x + I*c) + 6*I*a^3)*sqrt(e/(e^
(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 5*(d*e^3*e^(I*d*x + I*c)
- d*e^3)*integral(1/5*sqrt(2)*(3*I*a^3*e^(2*I*d*x + 2*I*c) + 6*I*a^3*e^(I*d
*x + I*c) + 3*I*a^3)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I
*c)/(d*e^3*e^(3*I*d*x + 3*I*c) - 2*d*e^3*e^(2*I*d*x + 2*I*c) + d*e^3*e^(I*d
*x + I*c)), x))/(d*e^3*e^(I*d*x + I*c) - d*e^3)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^3}{(e\sec(dx+c))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

maple [B] time = 0.96, size = 1086, normalized size = 9.78

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -1/10*a^3/d*(1+cos(d*x+c))*(-1+cos(d*x+c))^2*(-24*I*(1/(1+cos(d*x+c)))^(1/2
)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)*El
lipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)*sin(d*x+c)+12*I*(1/(1+co
s(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+
c))/sin(d*x+c),I)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)*sin(d*x+c)-12*I*(-co
s(d*x+c)/(1+cos(d*x+c))^2)^(1/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(d*x+c)+24*I*
(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+
cos(d*x+c))/sin(d*x+c),I)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)*cos(d*x+c)*s
in(d*x+c)+12*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*E
llipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)^2*sin(d*x+c)*(-cos(d*x+
c)/(1+cos(d*x+c))^2)^(1/2)+16*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)*cos(d*x+
c)^5+16*I*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)*cos(d*x+c)^4*sin(d*x+c)-20*I
*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)*cos(d*x+c)*sin(d*x+c)+5*I*cos(d*x+c)*
ln(-2*(2*cos(d*x+c)^2*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)-cos(d*x+c)^2+2*c
os(d*x+c)-2*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)-1)/sin(d*x+c)^2)*sin(d*x+c
)+16*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)*cos(d*x+c)^4-20*I*(-cos(d*x+c)/(1
+cos(d*x+c))^2)^(1/2)*cos(d*x+c)^2*sin(d*x+c)-28*cos(d*x+c)^3*(-cos(d*x+c)/
(1+cos(d*x+c))^2)^(1/2)+16*I*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)*cos(d*x+c
)^3*sin(d*x+c)-12*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)^2*sin(d*x+c)*(-cos
(d*x+c)/(1+cos(d*x+c))^2)^(1/2)-5*I*cos(d*x+c)*ln(-(2*cos(d*x+c)^2*(-cos(d*
x+c)/(1+cos(d*x+c))^2)^(1/2)-cos(d*x+c)^2+2*cos(d*x+c)-2*(-cos(d*x+c)/(1+co
s(d*x+c))^2)^(1/2)-1)/sin(d*x+c)^2)*sin(d*x+c)-16*cos(d*x+c)^2*(-cos(d*x+c)
/(1+cos(d*x+c))^2)^(1/2)+12*cos(d*x+c)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)
)/cos(d*x+c)^3/sin(d*x+c)^5/(e/cos(d*x+c))^(5/2)/(-cos(d*x+c)/(1+cos(d*x+c)
)^2)^(1/2)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^3}{(e\sec(dx+c))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

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

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

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+a\tan(c+d\,x)\,1\mathrm{i})^3}{\left(\frac{e}{\cos(c+d\,x)}\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^3/(e/cos(c + d*x))^(5/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^3/(e/cos(c + d*x))^(5/2), x)
```

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

$$-ia^3\left(\int \frac{i}{(e\sec(c+dx))^{\frac{5}{2}}}\,dx+\int\left(-\frac{3\tan(c+dx)}{(e\sec(c+dx))^{\frac{5}{2}}}\right)dx+\int \frac{\tan^3(c+dx)}{(e\sec(c+dx))^{\frac{5}{2}}}\,dx+\int\left(-\frac{3i\tan^2(c+dx)}{(e\sec(c+dx))^{\frac{5}{2}}}\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

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

```
[Out] -I*a**3*(Integral(I/(e*sec(c + d*x))**(5/2), x) + Integral(-3*tan(c + d*x)/
(e*sec(c + d*x))**(5/2), x) + Integral(tan(c + d*x)**3/(e*sec(c + d*x))**(5
/2), x) + Integral(-3*I*tan(c + d*x)**2/(e*sec(c + d*x))**(5/2), x))
```

3.208 $\int \frac{(a+ia\tan(c+dx))^3}{(e\sec(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=124

$$-\frac{2a^3\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{21de^4}-\frac{4i\left(a^3+ia^3\tan(c+dx)\right)}{21de^2(e\sec(c+dx))^{3/2}}-\frac{2i(a+ia\tan(c+dx))^3}{7d(e\sec(c+dx))^{7/2}}$$

```
[Out] -2/21*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2
*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(d*x+c))^(1/2)/d/e^4-2/7*I*(a+I
*a*tan(d*x+c))^3/d/(e*sec(d*x+c))^(7/2)-4/21*I*(a^3+I*a^3*tan(d*x+c))/d/e^2
/(e*sec(d*x+c))^(3/2)
```

Rubi [A] time = 0.13, antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3497, 3496, 3771, 2641}

$$-\frac{4i\left(a^3+ia^3\tan(c+dx)\right)}{21de^2(e\sec(c+dx))^{3/2}}-\frac{2a^3\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{21de^4}-\frac{2i(a+ia\tan(c+dx))^3}{7d(e\sec(c+dx))^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^3/(e*Sec[c + d*x])^(7/2),x]
```

```
[Out] (-2*a^3*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/
(21*d*e^4) - (((2*I)/7)*(a + I*a*Tan[c + d*x])^3)/(d*(e*Sec[c + d*x])^(7/2)
) - (((4*I)/21)*(a^3 + I*a^3*Tan[c + d*x]))/(d*e^2*(e*Sec[c + d*x])^(3/2))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^3}{(e\sec(c+dx))^{7/2}}\,dx = -\frac{2i(a+ia\tan(c+dx))^3}{7d(e\sec(c+dx))^{7/2}} + \frac{a\int \frac{(a+ia\tan(c+dx))^2}{(e\sec(c+dx))^{3/2}}\,dx}{7e^2}$$
$$= -\frac{2i(a+ia\tan(c+dx))^3}{7d(e\sec(c+dx))^{7/2}} - \frac{4i\left(a^3+ia^3\tan(c+dx)\right)}{21de^2(e\sec(c+dx))^{3/2}} - \frac{a^3\int \sqrt{e\sec(c+dx)}\,dx}{21e^4}$$
$$= -\frac{2i(a+ia\tan(c+dx))^3}{7d(e\sec(c+dx))^{7/2}} - \frac{4i\left(a^3+ia^3\tan(c+dx)\right)}{21de^2(e\sec(c+dx))^{3/2}} - \frac{\left(a^3\sqrt{\cos(c+dx)}\sqrt{e\sec(c\right.}{21e}$$
$$= -\frac{2a^3\sqrt{\cos(c+dx)}F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{21de^4} - \frac{2i(a+ia\tan(c+dx))^3}{7d(e\sec(c+dx))^{7/2}} - 4$$

Mathematica [A] time = 1.03, size = 133, normalized size = 1.07

$$-\frac{a^3\sqrt{e\sec(c+dx)}(\cos(2c+5dx)+i\sin(2c+5dx))\left(-\sin(2(c+dx))+5i\cos(2(c+dx))+2\sqrt{\cos(c+dx)}F\right(}{21de^4(\cos(dx)+i\sin(dx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^3/(e*Sec[c + d*x])^(7/2),x]
```

```
[Out] -1/21*(a^3*Sqrt[e*Sec[c + d*x]]*(5*I + (5*I)*Cos[2*(c + d*x)] + 2*Sqrt[Cos[
c + d*x]]*EllipticF[(c + d*x)/2, 2]*(Cos[2*(c + d*x)] - I*Sin[2*(c + d*x)])
 - Sin[2*(c + d*x)])*(Cos[2*c + 5*d*x] + I*Sin[2*c + 5*d*x]))/(d*e^4*(Cos[d
*x] + I*Sin[d*x])^3)
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\frac{21\,de^4\text{integral}\left(\frac{i\sqrt{2}a^3\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{21\,de^4},x\right)+\sqrt{2}\left(-3i\,a^3e^{(4i\,dx+4i\,c)}-5i\,a^3e^{(2i\,dx+2i\,c)}-2i\,a^3\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}e^{(}}{21\,de^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/21*(21*d*e^4*integral(1/21*I*sqrt(2)*a^3*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1)
)*e^(-1/2*I*d*x - 1/2*I*c)/(d*e^4), x) + sqrt(2)*(-3*I*a^3*e^(4*I*d*x + 4*I
*c) - 5*I*a^3*e^(2*I*d*x + 2*I*c) - 2*I*a^3)*sqrt(e/(e^(2*I*d*x + 2*I*c) +
1))*e^(1/2*I*d*x + 1/2*I*c))/(d*e^4)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^3}{(e\sec(dx+c))^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^3/(e*sec(d*x + c))^(7/2), x)
```

maple [A] time = 0.90, size = 199, normalized size = 1.60

$$-\frac{2a^3\left(12i\left(\cos^4(dx+c)\right)+i\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\text{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)\cos(dx+c)-12\left(\cos^3(dx\right.\right.}{21d\cos}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(7/2),x)
```

```
[Out] -2/21*a^3/d*(12*I*cos(d*x+c)^4+I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)-12*co
s(d*x+c)^3*sin(d*x+c)+I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-7*I*cos(d*x+c)^2+cos(d*x+
c)*sin(d*x+c))/cos(d*x+c)^4/(e/cos(d*x+c))^(7/2)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^3}{(e\sec(dx+c))^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^3/(e*sec(d*x + c))^(7/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+a\tan(c+d\,x)\,1\mathrm{i})^3}{\left(\frac{e}{\cos(c+d\,x)}\right)^{7/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^3/(e/cos(c + d*x))^(7/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^3/(e/cos(c + d*x))^(7/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**3/(e*sec(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.209 $\int \frac{(a+ia\tan(c+dx))^3}{(e\sec(c+dx))^{9/2}}\,dx$

Optimal. Leaf size=124

$$\frac{2a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15de^4\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{4i\left(a^3+ia^3\tan(c+dx)\right)}{15de^2(e\sec(c+dx))^{5/2}}-\frac{2i(a+ia\tan(c+dx))^3}{9d(e\sec(c+dx))^{9/2}}$$

```
[Out] 2/15*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*
d*x+1/2*c),2^(1/2))/d/e^4/cos(d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)-2/9*I*(a+I*
a*tan(d*x+c))^3/d/(e*sec(d*x+c))^(9/2)-4/15*I*(a^3+I*a^3*tan(d*x+c))/d/e^2/
(e*sec(d*x+c))^(5/2)
```

Rubi [A] time = 0.13, antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3497, 3496, 3771, 2639}

$$-\frac{4i\left(a^3+ia^3\tan(c+dx)\right)}{15de^2(e\sec(c+dx))^{5/2}}+\frac{2a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15de^4\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{2i(a+ia\tan(c+dx))^3}{9d(e\sec(c+dx))^{9/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^3/(e*Sec[c + d*x])^(9/2),x]
```

```
[Out] (2*a^3*EllipticE[(c + d*x)/2, 2])/(15*d*e^4*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c
 + d*x]]) - (((2*I)/9)*(a + I*a*Tan[c + d*x])^3)/(d*(e*Sec[c + d*x])^(9/2))
 - (((4*I)/15)*(a^3 + I*a^3*Tan[c + d*x]))/(d*e^2*(e*Sec[c + d*x])^(5/2))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^3}{(e\sec(c+dx))^{9/2}}\,dx = -\frac{2i(a+ia\tan(c+dx))^3}{9d(e\sec(c+dx))^{9/2}} + \frac{a\int \frac{(a+ia\tan(c+dx))^2}{(e\sec(c+dx))^{5/2}}\,dx}{3e^2}$$
$$= -\frac{2i(a+ia\tan(c+dx))^3}{9d(e\sec(c+dx))^{9/2}} - \frac{4i\left(a^3+ia^3\tan(c+dx)\right)}{15de^2(e\sec(c+dx))^{5/2}} + \frac{a^3\int \frac{1}{\sqrt{e\sec(c+dx)}}\,dx}{15e^4}$$
$$= -\frac{2i(a+ia\tan(c+dx))^3}{9d(e\sec(c+dx))^{9/2}} - \frac{4i\left(a^3+ia^3\tan(c+dx)\right)}{15de^2(e\sec(c+dx))^{5/2}} + \frac{a^3\int \sqrt{\cos(c+dx)}\,dx}{15e^4\sqrt{\cos(c+dx)}\sqrt{e\sec(c+}}$$
$$= \frac{2a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15de^4\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} - \frac{2i(a+ia\tan(c+dx))^3}{9d(e\sec(c+dx))^{9/2}} - \frac{4i\left(a^3+ia^3\tan(c+\right.}{15de^2(e\sec(c+dx)}$$

Mathematica [C] time = 2.67, size = 118, normalized size = 0.95

$$-\frac{a^3e^{-2i(c+dx)}\left(4\sqrt{1+e^{2i(c+dx)}}\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)+16e^{2i(c+dx)}+5e^{4i(c+dx)}+11\right)(\tan(c+dx)-i)^3}{90de^2(e\sec(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^3/(e*Sec[c + d*x])^(9/2),x]
```

```
[Out] -1/90*(a^3*(11 + 16*E^((2*I)*(c + d*x)) + 5*E^((4*I)*(c + d*x)) + 4*Sqrt[1
+ E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x)
)])*(-I + Tan[c + d*x])^3)/(d*e^2*E^((2*I)*(c + d*x))*(e*Sec[c + d*x])^(5/2
))
```

fricas [F] time = 0.52, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-5i\,a^3e^{(6i\,dx+6i\,c)}+5i\,a^3e^{(5i\,dx+5i\,c)}-16i\,a^3e^{(4i\,dx+4i\,c)}+16i\,a^3e^{(3i\,dx+3i\,c)}-23i\,a^3e^{(2i\,dx+2i\,c)}+11i\,a^3e^{(i\,dx+i\,c)}-12i\right.}{90\left(de^5e^{(i\right.}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(9/2),x, algorithm="fricas")
```

```
[Out] 1/90*(sqrt(2)*(-5*I*a^3*e^(6*I*d*x + 6*I*c) + 5*I*a^3*e^(5*I*d*x + 5*I*c) -
 16*I*a^3*e^(4*I*d*x + 4*I*c) + 16*I*a^3*e^(3*I*d*x + 3*I*c) - 23*I*a^3*e^(
2*I*d*x + 2*I*c) + 11*I*a^3*e^(I*d*x + I*c) - 12*I*a^3)*sqrt(e/(e^(2*I*d*x
+ 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 90*(d*e^5*e^(I*d*x + I*c) - d*e^5)
*integral(1/15*sqrt(2)*(-I*a^3*e^(2*I*d*x + 2*I*c) - 2*I*a^3*e^(I*d*x + I*c
) - I*a^3)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(d*e^5
*e^(3*I*d*x + 3*I*c) - 2*d*e^5*e^(2*I*d*x + 2*I*c) + d*e^5*e^(I*d*x + I*c))
, x))/(d*e^5*e^(I*d*x + I*c) - d*e^5)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^3}{(e\sec(dx+c))^{\frac{9}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(9/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^3/(e*sec(d*x + c))^(9/2), x)
```

maple [B] time = 0.98, size = 370, normalized size = 2.98

$$-\frac{2a^3\left(20i\left(\cos^5\left(dx+c\right)\right)\sin\left(dx+c\right)+20\left(\cos^6\left(dx+c\right)\right)+3i\cos\left(dx+c\right)\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \text{Elliptic}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(9/2),x)
```

```
[Out] -2/45*a^3/d*(20*I*cos(d*x+c)^5*sin(d*x+c)+20*cos(d*x+c)^6+3*I*cos(d*x+c)*(1
/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+co
s(d*x+c))/sin(d*x+c),I)*sin(d*x+c)-3*I*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*
(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)
*sin(d*x+c)-9*I*cos(d*x+c)^3*sin(d*x+c)+3*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d
*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+
c),I)-3*I*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(d*x+c)*(1/(1+cos(d*
x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-19*cos(d*x+c)^4+2*cos(d*x+c)
^2-3*cos(d*x+c))/cos(d*x+c)^5/sin(d*x+c)/(e/cos(d*x+c))^(9/2)
```

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

$$\int \frac{\left(i\,a\tan\left(dx+c\right)+a\right)^3}{\left(e\sec\left(dx+c\right)\right)^{\frac{9}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(9/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^3/(e*sec(d*x + c))^(9/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+a\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)^3}{\left(\frac{e}{\cos\left(c+d\,x\right)}\right)^{9/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^3/(e/cos(c + d*x))^(9/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^3/(e/cos(c + d*x))^(9/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**3/(e*sec(d*x+c))**(9/2),x)
```

```
[Out] Timed out
```

3.210 $\int \frac{(a+ia\tan(c+dx))^3}{(e\sec(c+dx))^{11/2}}\,dx$

Optimal. Leaf size=155

$$\frac{10a^3\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{77de^6}+\frac{10a^3\sin(c+dx)}{77de^5\sqrt{e\sec(c+dx)}}-\frac{20i\left(a^3+ia^3\tan(c+dx)\right)}{77de^2(e\sec(c+dx))^{7/2}}-\frac{2i(a+ia\tan(c+dx))^3}{11d(e\sec(c+dx))^{11/2}}$$

```
[Out] 10/77*a^3*sin(d*x+c)/d/e^5/(e*sec(d*x+c))^(1/2)+10/77*a^3*(cos(1/2*d*x+1/2*
c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*
x+c)^(1/2)*(e*sec(d*x+c))^(1/2)/d/e^6-2/11*I*(a+I*a*tan(d*x+c))^3/d/(e*sec(
d*x+c))^(11/2)-20/77*I*(a^3+I*a^3*tan(d*x+c))/d/e^2/(e*sec(d*x+c))^(7/2)
```

Rubi [A] time = 0.15, antiderivative size = 155, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {3497, 3496, 3769, 3771, 2641}

$$\frac{10a^3\sin(c+dx)}{77de^5\sqrt{e\sec(c+dx)}}-\frac{20i\left(a^3+ia^3\tan(c+dx)\right)}{77de^2(e\sec(c+dx))^{7/2}}+\frac{10a^3\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{77de^6}-\frac{2i(a+ia\tan(c+dx))^3}{11d(e\sec(c+dx))^{11/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^3/(e*Sec[c + d*x])^(11/2),x]
```

```
[Out] (10*a^3*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/
(77*d*e^6) + (10*a^3*Sin[c + d*x])/(77*d*e^5*Sqrt[e*Sec[c + d*x]]) - (((2*I
)/11)*(a + I*a*Tan[c + d*x])^3)/(d*(e*Sec[c + d*x])^(11/2)) - (((20*I)/77)*
(a^3 + I*a^3*Tan[c + d*x]))/(d*e^2*(e*Sec[c + d*x])^(7/2))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3769

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^3}{(e\sec(c+dx))^{11/2}}\,dx = -\frac{2i(a+ia\tan(c+dx))^3}{11d(e\sec(c+dx))^{11/2}} + \frac{(5a)\int \frac{(a+ia\tan(c+dx))^2}{(e\sec(c+dx))^{7/2}}\,dx}{11e^2}$$

$$= -\frac{2i(a+ia\tan(c+dx))^3}{11d(e\sec(c+dx))^{11/2}} - \frac{20i\left(a^3+ia^3\tan(c+dx)\right)}{77de^2(e\sec(c+dx))^{7/2}} + \frac{\left(15a^3\right)\int \frac{1}{(e\sec(c+dx))^{3/2}}\,dx}{77e^4}$$

$$= \frac{10a^3\sin(c+dx)}{77de^5\sqrt{e\sec(c+dx)}} - \frac{2i(a+ia\tan(c+dx))^3}{11d(e\sec(c+dx))^{11/2}} - \frac{20i\left(a^3+ia^3\tan(c+dx)\right)}{77de^2(e\sec(c+dx))^{7/2}} + \frac{(5}{}$$

$$= \frac{10a^3\sin(c+dx)}{77de^5\sqrt{e\sec(c+dx)}} - \frac{2i(a+ia\tan(c+dx))^3}{11d(e\sec(c+dx))^{11/2}} - \frac{20i\left(a^3+ia^3\tan(c+dx)\right)}{77de^2(e\sec(c+dx))^{7/2}} + \frac{(5}{}$$

$$= \frac{10a^3\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{77de^6} + \frac{10a^3\sin(c+dx)}{77de^5\sqrt{e\sec(c+dx)}} - \frac{2i(}{11}$$

Mathematica [A] time = 1.38, size = 148, normalized size = 0.95

$$\frac{a^3\sqrt{e\sec(c+dx)}\,(\cos(3(c+2dx))+i\sin(3(c+2dx)))\left(-15\sin(c+dx)-15\sin(3(c+dx))-46i\cos(c+dx)-\right.}{154de^6(\cos(dx)+i\sin(d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^3/(e*Sec[c + d*x])^(11/2),x]
```

```
[Out] (a^3*Sqrt[e*Sec[c + d*x]]*((-46*I)*Cos[c + d*x] - (22*I)*Cos[3*(c + d*x)] -
 15*Sin[c + d*x] + 20*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*(Cos[3*(
c + d*x)] - I*Sin[3*(c + d*x)]) - 15*Sin[3*(c + d*x)])*(Cos[3*(c + 2*d*x)]
+ I*Sin[3*(c + 2*d*x)]))/(154*d*e^6*(Cos[d*x] + I*Sin[d*x])^3)
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\frac{308\,de^6\text{integral}\left(-\frac{5i\sqrt{2}\,a^3\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{77\,de^6}, x\right) + \sqrt{2}\left(-7i\,a^3e^{(6i\,dx+6i\,c)} - 31i\,a^3e^{(4i\,dx+4i\,c)} - 61i\,a^3e^{(2i\,dx+2i\,c)}\right.}{308\,de^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(11/2),x, algorithm="fricas")
```

```
[Out] 1/308*(308*d*e^6*integral(-5/77*I*sqrt(2)*a^3*sqrt(e/(e^(2*I*d*x + 2*I*c) +
 1))*e^(-1/2*I*d*x - 1/2*I*c)/(d*e^6), x) + sqrt(2)*(-7*I*a^3*e^(6*I*d*x +
6*I*c) - 31*I*a^3*e^(4*I*d*x + 4*I*c) - 61*I*a^3*e^(2*I*d*x + 2*I*c) - 37*I
*a^3)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))/(d*e^6)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^3}{(e\sec(dx+c))^{\frac{11}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(11/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^3/(e*sec(d*x + c))^(11/2), x)
```

maple [A] time = 1.00, size = 216, normalized size = 1.39

$$-\frac{2a^3\left(28i\left(\cos^6\left(dx+c\right)\right)-28\left(\cos^5\left(dx+c\right)\right)\sin\left(dx+c\right)-11i\left(\cos^4\left(dx+c\right)\right)-5i\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \mathrm{El}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(11/2),x)
```

```
[Out] -2/77*a^3/d*(28*I*cos(d*x+c)^6-28*cos(d*x+c)^5*sin(d*x+c)-11*I*cos(d*x+c)^4
-5*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I
*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)-3*cos(d*x+c)^3*sin(d*x+c)-5*I*(1/
(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos
(d*x+c))/sin(d*x+c),I)-5*cos(d*x+c)*sin(d*x+c))/cos(d*x+c)^6/(e/cos(d*x+c))
^(11/2)
```

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

$$\int \frac{\left(i\,a\tan\left(dx+c\right)+a\right)^3}{\left(e\sec\left(dx+c\right)\right)^{\frac{11}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(11/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^3/(e*sec(d*x + c))^(11/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+a\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)^3}{{\left(\frac{e}{\cos\left(c+d\,x\right)}\right)}^{11/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^3/(e/cos(c + d*x))^(11/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^3/(e/cos(c + d*x))^(11/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**3/(e*sec(d*x+c))**(11/2),x)
```

```
[Out] Timed out
```

3.211 $\int \frac{(a+ia\tan(c+dx))^3}{(e\sec(c+dx))^{13/2}}\,dx$

Optimal. Leaf size=155

$$\frac{14a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{39de^6\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{14a^3\sin(c+dx)}{117de^5(e\sec(c+dx))^{3/2}}-\frac{28i\left(a^3+ia^3\tan(c+dx)\right)}{117de^2(e\sec(c+dx))^{9/2}}-\frac{2i(a+ia\tan(c+dx)}{13d(e\sec(c+dx))^{13}}$$

```
[Out] 14/117*a^3*sin(d*x+c)/d/e^5/(e*sec(d*x+c))^(3/2)+14/39*a^3*(cos(1/2*d*x+1/2
*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/d/e^6
/cos(d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)-2/13*I*(a+I*a*tan(d*x+c))^3/d/(e*sec
(d*x+c))^(13/2)-28/117*I*(a^3+I*a^3*tan(d*x+c))/d/e^2/(e*sec(d*x+c))^(9/2)
```

Rubi [A] time = 0.15, antiderivative size = 155, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {3497, 3496, 3769, 3771, 2639}

$$\frac{14a^3\sin(c+dx)}{117de^5(e\sec(c+dx))^{3/2}}-\frac{28i\left(a^3+ia^3\tan(c+dx)\right)}{117de^2(e\sec(c+dx))^{9/2}}+\frac{14a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{39de^6\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{2i(a+ia\tan(c+dx)}{13d(e\sec(c+dx))^{13}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^3/(e*Sec[c + d*x])^(13/2),x]
```

```
[Out] (14*a^3*EllipticE[(c + d*x)/2, 2])/(39*d*e^6*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[
c + d*x]]) + (14*a^3*Sin[c + d*x])/(117*d*e^5*(e*Sec[c + d*x])^(3/2)) - (((
2*I)/13)*(a + I*a*Tan[c + d*x])^3)/(d*(e*Sec[c + d*x])^(13/2)) - (((28*I)/1
17)*(a^3 + I*a^3*Tan[c + d*x]))/(d*e^2*(e*Sec[c + d*x])^(9/2))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3769

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^3}{(e\sec(c+dx))^{13/2}}\,dx = -\frac{2i(a+ia\tan(c+dx))^3}{13d(e\sec(c+dx))^{13/2}} + \frac{(7a)\int \frac{(a+ia\tan(c+dx))^2}{(e\sec(c+dx))^{9/2}}\,dx}{13e^2}$$

$$= -\frac{2i(a+ia\tan(c+dx))^3}{13d(e\sec(c+dx))^{13/2}} - \frac{28i\left(a^3+ia^3\tan(c+dx)\right)}{117de^2(e\sec(c+dx))^{9/2}} + \frac{\left(35a^3\right)\int \frac{1}{(e\sec(c+dx))^{5/2}}\,dx}{117e^4}$$

$$= \frac{14a^3\sin(c+dx)}{117de^5(e\sec(c+dx))^{3/2}} - \frac{2i(a+ia\tan(c+dx))^3}{13d(e\sec(c+dx))^{13/2}} - \frac{28i\left(a^3+ia^3\tan(c+dx)\right)}{117de^2(e\sec(c+dx))^{9/2}} + \frac{(7\ldots}{\ldots}$$

$$= \frac{14a^3\sin(c+dx)}{117de^5(e\sec(c+dx))^{3/2}} - \frac{2i(a+ia\tan(c+dx))^3}{13d(e\sec(c+dx))^{13/2}} - \frac{28i\left(a^3+ia^3\tan(c+dx)\right)}{117de^2(e\sec(c+dx))^{9/2}} + \frac{\ldots}{39\ldots}$$

$$= \frac{14a^3E\left(\frac{1}{2}(c+dx)\middle|2\right)}{39de^6\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} + \frac{14a^3\sin(c+dx)}{117de^5(e\sec(c+dx))^{3/2}} - \frac{2i(a+ia\tan(c+d\ldots}{13d(e\sec(c+dx))\ldots}$$

Mathematica [C] time = 6.67, size = 155, normalized size = 1.00

$$-\frac{a^3e^{-4i(c+dx)}\left(112e^{2i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)-34e^{2i(c+dx)}+124e^{4i(c+dx)}+50e^{6i(c+dx)}+9e^{8i(c+dx)}\ldots}{936de^4(e\sec(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^3/(e*Sec[c + d*x])^(13/2),x]
```

```
[Out] -1/936*(a^3*(-117 - 34*E^((2*I)*(c + d*x)) + 124*E^((4*I)*(c + d*x)) + 50*E
^((6*I)*(c + d*x)) + 9*E^((8*I)*(c + d*x)) + 112*E^((2*I)*(c + d*x))*Sqrt[1
 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x
))])*(-I + Tan[c + d*x])^3)/(d*e^4*E^((4*I)*(c + d*x))*(e*Sec[c + d*x])^(5/
2))
```

fricas [F] time = 0.65, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-9i\,a^3e^{(9i\,dx+9i\,c)}+9i\,a^3e^{(8i\,dx+8i\,c)}-50i\,a^3e^{(7i\,dx+7i\,c)}+50i\,a^3e^{(6i\,dx+6i\,c)}-124i\,a^3e^{(5i\,dx+5i\,c)}+124i\,a^3e^{(4i\,dx+4i\,c)}-\ldots\right.}{\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(13/2),x, algorithm="fricas")
```

```
[Out] 1/936*(sqrt(2)*(-9*I*a^3*e^(9*I*d*x + 9*I*c) + 9*I*a^3*e^(8*I*d*x + 8*I*c)
- 50*I*a^3*e^(7*I*d*x + 7*I*c) + 50*I*a^3*e^(6*I*d*x + 6*I*c) - 124*I*a^3*e
^(5*I*d*x + 5*I*c) + 124*I*a^3*e^(4*I*d*x + 4*I*c) - 302*I*a^3*e^(3*I*d*x +
 3*I*c) - 34*I*a^3*e^(2*I*d*x + 2*I*c) - 219*I*a^3*e^(I*d*x + I*c) - 117*I*
a^3)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 936*(d*e^7
*e^(2*I*d*x + 2*I*c) - d*e^7*e^(I*d*x + I*c))*integral(1/39*sqrt(2)*(-7*I*a
^3*e^(2*I*d*x + 2*I*c) - 14*I*a^3*e^(I*d*x + I*c) - 7*I*a^3)*sqrt(e/(e^(2*I
```

```
*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(d*e^7*e^(3*I*d*x + 3*I*c) - 2*
d*e^7*e^(2*I*d*x + 2*I*c) + d*e^7*e^(I*d*x + I*c)), x))/(d*e^7*e^(2*I*d*x +
 2*I*c) - d*e^7*e^(I*d*x + I*c))
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^3}{(e\sec(dx+c))^{\frac{13}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(13/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^3/(e*sec(d*x + c))^(13/2), x)
```

maple [B] time = 1.16, size = 380, normalized size = 2.45

$$-\frac{2a^3\left(36i\left(\cos^7(dx+c)\right)\sin(dx+c)+36\left(\cos^8(dx+c)\right)-13i\left(\cos^5(dx+c)\right)\sin(dx+c)+21i\cos(dx+c)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(13/2),x)
```

```
[Out] -2/117*a^3/d*(36*I*cos(d*x+c)^7*sin(d*x+c)+36*cos(d*x+c)^8-13*I*cos(d*x+c)^
5*sin(d*x+c)+21*I*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)*sin(
d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-21*I*Elli
pticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)*sin(d*x+c)*(1/(1+cos(d*x+c
)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-31*cos(d*x+c)^6+21*I*EllipticE(
I*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)-21*I*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*s
in(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+2*cos(
d*x+c)^4+14*cos(d*x+c)^2-21*cos(d*x+c))/cos(d*x+c)^7/sin(d*x+c)/(e/cos(d*x+
c))^(13/2)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^3}{(e\sec(dx+c))^{\frac{13}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(13/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^3/(e*sec(d*x + c))^(13/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+a\tan(c+d\,x)\,1\mathrm{i})^3}{\left(\frac{e}{\cos(c+d\,x)}\right)^{13/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^3/(e/cos(c + d*x))^(13/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^3/(e/cos(c + d*x))^(13/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**3/(e*sec(d*x+c))**(13/2),x)
```

```
[Out] Timed out
```

3.212 $\int \frac{(a+ia\tan(c+dx))^3}{(e\sec(c+dx))^{15/2}}\,dx$

Optimal. Leaf size=186

$$\frac{2a^3\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{11de^8}+\frac{2a^3\sin(c+dx)}{11de^7\sqrt{e\sec(c+dx)}}+\frac{6a^3\sin(c+dx)}{55de^5(e\sec(c+dx))^{5/2}}-\frac{12i\left(a^3+ia^3\right.}{55de^2(e\sec}$$

```
[Out] 6/55*a^3*sin(d*x+c)/d/e^5/(e*sec(d*x+c))^(5/2)+2/11*a^3*sin(d*x+c)/d/e^7/(e
*sec(d*x+c))^(1/2)+2/11*a^3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)
*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(d*x+c))^(1/2
)/d/e^8-2/15*I*(a+I*a*tan(d*x+c))^3/d/(e*sec(d*x+c))^(15/2)-12/55*I*(a^3+I*
a^3*tan(d*x+c))/d/e^2/(e*sec(d*x+c))^(11/2)
```

Rubi [A] time = 0.17, antiderivative size = 186, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {3497, 3496, 3769, 3771, 2641}

$$\frac{2a^3\sin(c+dx)}{11de^7\sqrt{e\sec(c+dx)}}+\frac{6a^3\sin(c+dx)}{55de^5(e\sec(c+dx))^{5/2}}-\frac{12i\left(a^3+ia^3\tan(c+dx)\right)}{55de^2(e\sec(c+dx))^{11/2}}+\frac{2a^3\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{}}{11de^8}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^3/(e*Sec[c + d*x])^(15/2),x]
```

```
[Out] (2*a^3*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(
11*d*e^8) + (6*a^3*Sin[c + d*x])/(55*d*e^5*(e*Sec[c + d*x])^(5/2)) + (2*a^3
*Sin[c + d*x])/(11*d*e^7*Sqrt[e*Sec[c + d*x]]) - (((2*I)/15)*(a + I*a*Tan[c
 + d*x])^3)/(d*(e*Sec[c + d*x])^(15/2)) - (((12*I)/55)*(a^3 + I*a^3*Tan[c +
 d*x]))/(d*e^2*(e*Sec[c + d*x])^(11/2))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
```

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^3}{(e\sec(c+dx))^{15/2}}\,dx = -\frac{2i(a+ia\tan(c+dx))^3}{15d(e\sec(c+dx))^{15/2}} + \frac{(3a)\int \frac{(a+ia\tan(c+dx))^2}{(e\sec(c+dx))^{11/2}}\,dx}{5e^2}$$

$$= -\frac{2i(a+ia\tan(c+dx))^3}{15d(e\sec(c+dx))^{15/2}} - \frac{12i\left(a^3+ia^3\tan(c+dx)\right)}{55de^2(e\sec(c+dx))^{11/2}} + \frac{\left(21a^3\right)\int \frac{1}{(e\sec(c+dx))^{7/2}}\,dx}{55e^4}$$

$$= \frac{6a^3\sin(c+dx)}{55de^5(e\sec(c+dx))^{5/2}} - \frac{2i(a+ia\tan(c+dx))^3}{15d(e\sec(c+dx))^{15/2}} - \frac{12i\left(a^3+ia^3\tan(c+dx)\right)}{55de^2(e\sec(c+dx))^{11/2}} + \frac{(3a}{}$$

$$= \frac{6a^3\sin(c+dx)}{55de^5(e\sec(c+dx))^{5/2}} + \frac{2a^3\sin(c+dx)}{11de^7\sqrt{e\sec(c+dx)}} - \frac{2i(a+ia\tan(c+dx))^3}{15d(e\sec(c+dx))^{15/2}} - \frac{12i\left(a^3\right.}{55de^2(e}$$

$$= \frac{6a^3\sin(c+dx)}{55de^5(e\sec(c+dx))^{5/2}} + \frac{2a^3\sin(c+dx)}{11de^7\sqrt{e\sec(c+dx)}} - \frac{2i(a+ia\tan(c+dx))^3}{15d(e\sec(c+dx))^{15/2}} - \frac{12i\left(a^3\right.}{55de^2(e}$$

$$= \frac{2a^3\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{11de^8} + \frac{6a^3\sin(c+dx)}{55de^5(e\sec(c+dx))^{5/2}} + \frac{2a}{11de^7}$$

Mathematica [A] time = 2.03, size = 170, normalized size = 0.91

$$\frac{a^3\sqrt{e\sec(c+dx)}\,(\cos(3(c+2dx))+i\sin(3(c+2dx)))\left(-114\sin(c+dx)-81\sin(3(c+dx))+33\sin(5(c+dx))-\right.}{1320d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^3/(e*Sec[c + d*x])^(15/2),x]
```

```
[Out] (a^3*Sqrt[e*Sec[c + d*x]]*((-332*I)*Cos[c + d*x] - (154*I)*Cos[3*(c + d*x)]
 + (22*I)*Cos[5*(c + d*x)] - 114*Sin[c + d*x] + 240*Sqrt[Cos[c + d*x]]*Elli
pticF[(c + d*x)/2, 2]*(Cos[3*(c + d*x)] - I*Sin[3*(c + d*x)]) - 81*Sin[3*(c
 + d*x)] + 33*Sin[5*(c + d*x)])*(Cos[3*(c + 2*d*x)] + I*Sin[3*(c + 2*d*x)])
)/(1320*d*e^8*(Cos[d*x] + I*Sin[d*x])^3)
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\frac{\left(2640\,de^8e^{(2i\,dx+2i\,c)}\text{integral}\left(-\frac{i\sqrt{2}\,a^3\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{11\,de^8},x\right)+\sqrt{2}\left(-11i\,a^3e^{(10i\,dx+10i\,c)}-73i\,a^3e^{(8i\,dx+8i\,c)}-218i\right.\right.}{2640\,de^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(15/2),x, algorithm="fricas")
```

```
[Out] 1/2640*(2640*d*e^8*e^(2*I*d*x + 2*I*c)*integral(-1/11*I*sqrt(2)*a^3*sqrt(e/
(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(d*e^8), x) + sqrt(2)*(
```

```
-11*I*a^3*e^(10*I*d*x + 10*I*c) - 73*I*a^3*e^(8*I*d*x + 8*I*c) - 218*I*a^3*
e^(6*I*d*x + 6*I*c) - 446*I*a^3*e^(4*I*d*x + 4*I*c) - 235*I*a^3*e^(2*I*d*x
+ 2*I*c) + 55*I*a^3)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I
*c))*e^(-2*I*d*x - 2*I*c)/(d*e^8)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^3}{(e\sec(dx+c))^{\frac{15}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(15/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^3/(e*sec(d*x + c))^(15/2), x)
```

maple [A] time = 1.21, size = 232, normalized size = 1.25

$$-\frac{2a^3\left(44i\left(\cos^8(dx+c)\right)-44\sin(dx+c)\left(\cos^7(dx+c)\right)-15i\left(\cos^6(dx+c)\right)-7\left(\cos^5(dx+c)\right)\sin(dx+c)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(15/2),x)
```

```
[Out] -2/165*a^3/d*(44*I*cos(d*x+c)^8-44*sin(d*x+c)*cos(d*x+c)^7-15*I*cos(d*x+c)^
6-7*cos(d*x+c)^5*sin(d*x+c)-15*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)-15*I*
(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+
cos(d*x+c))/sin(d*x+c),I)-9*cos(d*x+c)^3*sin(d*x+c)-15*cos(d*x+c)*sin(d*x+c
))/cos(d*x+c)^8/(e/cos(d*x+c))^(15/2)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^3}{(e\sec(dx+c))^{\frac{15}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^3/(e*sec(d*x+c))^(15/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^3/(e*sec(d*x + c))^(15/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+a\tan(c+d\,x)\,1\mathrm{i})^3}{\left(\frac{e}{\cos(c+d\,x)}\right)^{15/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^3/(e/cos(c + d*x))^(15/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^3/(e/cos(c + d*x))^(15/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**3/(e*sec(d*x+c))**(15/2),x)
```

```
[Out] Timed out
```

3.213 $\int (e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^4\,dx$

Optimal. Leaf size=215

$$-\frac{22a^4e^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{3d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{22ia^4(e\sec(c+dx))^{3/2}}{9d}+\frac{22a^4e\sin(c+dx)\sqrt{e\sec(c+dx)}}{3d}+\frac{22i\left(a^4+ia^4\tan(c\right.}{}$$

```
[Out] 22/9*I*a^4*(e*sec(d*x+c))^(3/2)/d-22/3*a^4*e^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)
/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/d/cos(d*x+c)^(1/2
)/(e*sec(d*x+c))^(1/2)+22/3*a^4*e*sin(d*x+c)*(e*sec(d*x+c))^(1/2)/d+2/9*I*a
*(e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^3/d+10/21*I*(e*sec(d*x+c))^(3/2)*(
a^2+I*a^2*tan(d*x+c))^2/d+22/21*I*(e*sec(d*x+c))^(3/2)*(a^4+I*a^4*tan(d*x+c
))/d
```

Rubi [A] time = 0.26, antiderivative size = 215, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used = {3498, 3486, 3768, 3771, 2639}

$$-\frac{22a^4e^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{3d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{22ia^4(e\sec(c+dx))^{3/2}}{9d}+\frac{22a^4e\sin(c+dx)\sqrt{e\sec(c+dx)}}{3d}+\frac{10i\left(a^2+ia^2\tan(c\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (-22*a^4*e^2*EllipticE[(c + d*x)/2, 2])/(3*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[
c + d*x]]) + (((22*I)/9)*a^4*(e*Sec[c + d*x])^(3/2))/d + (22*a^4*e*Sqrt[e*S
ec[c + d*x]]*Sin[c + d*x])/(3*d) + (((2*I)/9)*a*(e*Sec[c + d*x])^(3/2)*(a +
 I*a*Tan[c + d*x])^3)/d + (((10*I)/21)*(e*Sec[c + d*x])^(3/2)*(a^2 + I*a^2*
Tan[c + d*x])^2)/d + (((22*I)/21)*(e*Sec[c + d*x])^(3/2)*(a^4 + I*a^4*Tan[c
 + d*x]))/d
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

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

Rule 3498

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

Rule 3768

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

```
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int (e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^4\,dx = \frac{2ia(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^3}{9d} + \frac{1}{3}(5a)\int (e\sec(c+d$$

$$= \frac{2ia(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^3}{9d} + \frac{10i(e\sec(c+dx))^{3/2}}{2}$$

$$= \frac{2ia(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^3}{9d} + \frac{10i(e\sec(c+dx))^{3/2}}{2}$$

$$= \frac{22ia^4(e\sec(c+dx))^{3/2}}{9d} + \frac{2ia(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx)}{9d}$$

$$= \frac{22ia^4(e\sec(c+dx))^{3/2}}{9d} + \frac{22a^4e\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{3d} + \frac{2ia}{}$$

$$= \frac{22ia^4(e\sec(c+dx))^{3/2}}{9d} + \frac{22a^4e\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{3d} + \frac{2ia}{}$$

$$= -\frac{22a^4e^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{3d\sqrt{\cos(c+dx)}\,\sqrt{e\sec(c+dx)}} + \frac{22ia^4(e\sec(c+dx))^{3/2}}{9d} + \frac{22}{}$$

Mathematica [C] time = 7.82, size = 429, normalized size = 2.00

$$\frac{22i\sqrt{2}\,e^{-i(3c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\,\sqrt{1+e^{2i(c+dx)}}\left(\left(-1+e^{2ic}\right)e^{2idx}\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)-3\sqrt{1+e^{2i(c+dx)}}\right)(a+ia\tan}{9\left(-1+e^{2ic}\right)d\sec^{\frac{11}{2}}(c+dx)(\cos(dx)+i\sin(dx))^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (((22*I)/9)*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x)))]*Sqrt[1
+ E^((2*I)*(c + d*x))]*(-3*Sqrt[1 + E^((2*I)*(c + d*x))] + E^((2*I)*d*x)*(-
1 + E^((2*I)*c))*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x))])*(e
*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^4)/(d*E^(I*(3*c + d*x))*(-1 + E
^((2*I)*c))*Sec[c + d*x]^(11/2)*(Cos[d*x] + I*Sin[d*x])^4) + (Cos[c + d*x]^
5*(e*Sec[c + d*x])^(3/2)*(Sec[c]*Sec[c + d*x]^3*(36*Cos[c] + (7*I)*Sin[c])*
(((-2*I)/63)*Cos[4*c] - (2*Sin[4*c])/63) + Cos[d*x]*Csc[c]*((22*Cos[4*c])/3
 - ((22*I)/3)*Sin[4*c]) + Sec[c]*Sec[c + d*x]*(24*Cos[c] + (13*I)*Sin[c])*(
((2*I)/9)*Cos[4*c] + (2*Sin[4*c])/9) + Sec[c]*Sec[c + d*x]^4*((2*Cos[4*c])/
9 - ((2*I)/9)*Sin[4*c])*Sin[d*x] + Sec[c]*Sec[c + d*x]^2*((-26*Cos[4*c])/9
+ ((26*I)/9)*Sin[4*c])*Sin[d*x])*(a + I*a*Tan[c + d*x])^4)/(d*(Cos[d*x] + I
*Sin[d*x])^4)
```

fricas [F] time = 0.66, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-462i\,a^4ee^{(9i\,dx+9i\,c)}-812i\,a^4ee^{(7i\,dx+7i\,c)}-1080i\,a^4ee^{(5i\,dx+5i\,c)}-660i\,a^4ee^{(3i\,dx+3i\,c)}-154i\,a^4ee^{(i\,dx+i\,c)}\right)\sqrt{\frac{e}{e^{(2i\,dx+2}}}}{63\left(de^{(8i\,dx+8i\,c)}+4\,de^{(6i\,dx+}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/63*(sqrt(2)*(-462*I*a^4*e*e^(9*I*d*x + 9*I*c) - 812*I*a^4*e*e^(7*I*d*x +
7*I*c) - 1080*I*a^4*e*e^(5*I*d*x + 5*I*c) - 660*I*a^4*e*e^(3*I*d*x + 3*I*c)
 - 154*I*a^4*e*e^(I*d*x + I*c))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*
d*x + 1/2*I*c) + 63*(d*e^(8*I*d*x + 8*I*c) + 4*d*e^(6*I*d*x + 6*I*c) + 6*d*
e^(4*I*d*x + 4*I*c) + 4*d*e^(2*I*d*x + 2*I*c) + d)*integral(11/3*I*sqrt(2)*
a^4*e*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/d, x))/(d*e
^(8*I*d*x + 8*I*c) + 4*d*e^(6*I*d*x + 6*I*c) + 6*d*e^(4*I*d*x + 4*I*c) + 4*
d*e^(2*I*d*x + 2*I*c) + d)
```

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

$$\int (e\sec(dx+c))^{\frac{3}{2}}\,(i\,a\tan(dx+c)+a)^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(3/2)*(I*a*tan(d*x + c) + a)^4, x)
```

maple [A] time = 1.01, size = 401, normalized size = 1.87

$$-\frac{2a^4\,(1+\cos(dx+c))^2\,(-1+\cos(dx+c))^2\left(231i\left(\cos^5(dx+c)\right)\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\mathrm{EllipticF}\left(\frac{i(-1+\cos(d}{\sin(dx+}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] -2/63*a^4/d*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(231*I*cos(d*x+c)^5*(1/(1+co
s(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+
c))/sin(d*x+c),I)*sin(d*x+c)-231*I*cos(d*x+c)^5*(1/(1+cos(d*x+c)))^(1/2)*(c
os(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*s
in(d*x+c)+231*I*cos(d*x+c)^4*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*
x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(d*x+c)-231*I*cos
(d*x+c)^4*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Ellipt
icE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(d*x+c)-168*I*cos(d*x+c)^3*sin(d*x+c
)+231*cos(d*x+c)^5-322*cos(d*x+c)^4+36*I*cos(d*x+c)*sin(d*x+c)+98*cos(d*x+c
)^2-7)*(e/cos(d*x+c))^(3/2)/cos(d*x+c)^3/sin(d*x+c)^5
```

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

$$\int (e\sec(dx+c))^{\frac{3}{2}}\,(i\,a\tan(dx+c)+a)^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] integrate((e*sec(d*x + c))^(3/2)*(I*a*tan(d*x + c) + a)^4, x)
```

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

$$\int \left(\frac{e}{\cos(c+d\,x)}\right)^{3/2} (a+a\tan(c+d\,x)\,1\mathrm{i})^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^4,x)
```

```
[Out] int((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^4, x)
```

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

$$a^4 \left(\int (e\sec(c+dx))^{\frac{3}{2}}\,dx + \int \left(-6(e\sec(c+dx))^{\frac{3}{2}}\tan^2(c+dx)\right)dx + \int (e\sec(c+dx))^{\frac{3}{2}}\tan^4(c+dx)\,dx + \right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(3/2)*(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] a**4*(Integral((e*sec(c + d*x))**(3/2), x) + Integral(-6*(e*sec(c + d*x))**
(3/2)*tan(c + d*x)**2, x) + Integral((e*sec(c + d*x))**(3/2)*tan(c + d*x)**
4, x) + Integral(4*I*(e*sec(c + d*x))**(3/2)*tan(c + d*x), x) + Integral(-4
*I*(e*sec(c + d*x))**(3/2)*tan(c + d*x)**3, x))
```

3.214 $\int \sqrt{e \sec(c+dx)}\,(a+ia\tan(c+dx))^4\,dx$

Optimal. Leaf size=183

$$\frac{78ia^4\sqrt{e\sec(c+dx)}}{7d}+\frac{78i\left(a^4+ia^4\tan(c+dx)\right)\sqrt{e\sec(c+dx)}}{35d}+\frac{78a^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+d}}{7d}$$

```
[Out] 78/7*I*a^4*(e*sec(d*x+c))^(1/2)/d+78/7*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos
(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*s
ec(d*x+c))^(1/2)/d+2/7*I*a*(e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^3/d+26/3
5*I*(e*sec(d*x+c))^(1/2)*(a^2+I*a^2*tan(d*x+c))^2/d+78/35*I*(e*sec(d*x+c))^
(1/2)*(a^4+I*a^4*tan(d*x+c))/d
```

Rubi [A] time = 0.20, antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {3498, 3486, 3771, 2641}

$$\frac{78ia^4\sqrt{e\sec(c+dx)}}{7d}+\frac{26i\left(a^2+ia^2\tan(c+dx)\right)^2\sqrt{e\sec(c+dx)}}{35d}+\frac{78i\left(a^4+ia^4\tan(c+dx)\right)\sqrt{e\sec(c+dx)}}{35d}+\frac{78a}{}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (((78*I)/7)*a^4*Sqrt[e*Sec[c + d*x]])/d + (78*a^4*Sqrt[Cos[c + d*x]]*Ellipt
icF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(7*d) + (((2*I)/7)*a*Sqrt[e*Sec[c
 + d*x]]*(a + I*a*Tan[c + d*x])^3)/d + (((26*I)/35)*Sqrt[e*Sec[c + d*x]]*(a
^2 + I*a^2*Tan[c + d*x])^2)/d + (((78*I)/35)*Sqrt[e*Sec[c + d*x]]*(a^4 + I*
a^4*Tan[c + d*x]))/d
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

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

Rule 3498

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^4\,dx = \frac{2ia\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^3}{7d} + \frac{1}{7}(13a)\int \sqrt{e\sec(c+dx}$$

$$= \frac{2ia\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^3}{7d} + \frac{26i\sqrt{e\sec(c+dx)}\,\left(a^2+\right.}{35d}$$

$$= \frac{2ia\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^3}{7d} + \frac{26i\sqrt{e\sec(c+dx)}\,\left(a^2+\right.}{35d}$$

$$= \frac{78ia^4\sqrt{e\sec(c+dx)}}{7d} + \frac{2ia\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^3}{7d} +$$

$$= \frac{78ia^4\sqrt{e\sec(c+dx)}}{7d} + \frac{2ia\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^3}{7d} +$$

$$= \frac{78ia^4\sqrt{e\sec(c+dx)}}{7d} + \frac{78a^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec}}{7d}$$

Mathematica [A] time = 1.76, size = 101, normalized size = 0.55

$$\frac{a^4\sec^4(c+dx)\sqrt{e\sec(c+dx)}\,\left(-150\sin(2(c+dx))-85\sin(4(c+dx))+1008i\cos(2(c+dx))+280i\cos(4(c\right.}{140d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (a^4*Sec[c + d*x]^4*Sqrt[e*Sec[c + d*x]]*(728*I + (1008*I)*Cos[2*(c + d*x)]
 + (280*I)*Cos[4*(c + d*x)] + 1560*Cos[c + d*x]^(9/2)*EllipticF[(c + d*x)/2
, 2] - 150*Sin[2*(c + d*x)] - 85*Sin[4*(c + d*x)]))/(140*d)
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(730i\,a^4e^{(6i\,dx+6i\,c)}+1586i\,a^4e^{(4i\,dx+4i\,c)}+1326i\,a^4e^{(2i\,dx+2i\,c)}+390i\,a^4\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+35\left(de^{(6i\,dx}\right.}{35\left(de^{(6i\,dx+6i\,c)}+3\,de^{(4i\,dx+4i\,c)}+3\,de^{(2}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/35*(sqrt(2)*(730*I*a^4*e^(6*I*d*x + 6*I*c) + 1586*I*a^4*e^(4*I*d*x + 4*I*
c) + 1326*I*a^4*e^(2*I*d*x + 2*I*c) + 390*I*a^4)*sqrt(e/(e^(2*I*d*x + 2*I*c
) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 35*(d*e^(6*I*d*x + 6*I*c) + 3*d*e^(4*I*d*
x + 4*I*c) + 3*d*e^(2*I*d*x + 2*I*c) + d)*integral(-39/7*I*sqrt(2)*a^4*sqrt
(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/d, x))/(d*e^(6*I*d*x
 + 6*I*c) + 3*d*e^(4*I*d*x + 4*I*c) + 3*d*e^(2*I*d*x + 2*I*c) + d)
```

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

$$\int \sqrt{e\sec(dx+c)}\,(i\,a\tan(dx+c)+a)^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*sec(d*x + c))*(I*a*tan(d*x + c) + a)^4, x)
```

maple [A] time = 1.00, size = 230, normalized size = 1.26

$$2a^4(1+\cos(dx+c))^2(-1+\cos(dx+c))^2\left(195i\,\text{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)\left(\cos^4(dx+c)\right)\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(d}{1+\cos(}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 2/35*a^4/d*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(195*I*EllipticF(I*(-1+cos(d*
x+c))/sin(d*x+c),I)*cos(d*x+c)^4*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)+195*I*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)
^3*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+280*I*cos(d*x
+c)^3-85*cos(d*x+c)^2*sin(d*x+c)-28*I*cos(d*x+c)+5*sin(d*x+c))*(e/cos(d*x+c
))^(1/2)/cos(d*x+c)^3/sin(d*x+c)^4
```

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

$$\int\sqrt{e\sec(dx+c)}\,(i\,a\tan(dx+c)+a)^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(e*sec(d*x + c))*(I*a*tan(d*x + c) + a)^4, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\sqrt{\frac{e}{\cos(c+d\,x)}}\,\left(a+a\tan(c+d\,x)\,1\mathrm{i}\right)^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^4,x)
```

```
[Out] int((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^4, x)
```

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

$$a^4\left(\int\sqrt{e\sec(c+dx)}\,dx+\int\left(-6\sqrt{e\sec(c+dx)}\tan^2(c+dx)\right)dx+\int\sqrt{e\sec(c+dx)}\tan^4(c+dx)\,dx+\int 4i\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(1/2)*(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] a**4*(Integral(sqrt(e*sec(c + d*x)), x) + Integral(-6*sqrt(e*sec(c + d*x))*
tan(c + d*x)**2, x) + Integral(sqrt(e*sec(c + d*x))*tan(c + d*x)**4, x) + I
ntegral(4*I*sqrt(e*sec(c + d*x))*tan(c + d*x), x) + Integral(-4*I*sqrt(e*se
c(c + d*x))*tan(c + d*x)**3, x))
```

3.215 $\int \frac{(a+ia\tan(c+dx))^4}{\sqrt{e\sec(c+dx)}}\,dx$

Optimal. Leaf size=178

$$-\frac{154ia^4(e\sec(c+dx))^{3/2}}{15de^2}-\frac{22i\left(a^4+ia^4\tan(c+dx)\right)(e\sec(c+dx))^{3/2}}{5de^2}-\frac{154a^4\sin(c+dx)\sqrt{e\sec(c+dx)}}{5de}+\frac{}{5d\sqrt{}}$$

```
[Out] -154/15*I*a^4*(e*sec(d*x+c))^(3/2)/d/e^2+154/5*a^4*(cos(1/2*d*x+1/2*c)^2)^(
1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/d/cos(d*x+c)^
(1/2)/(e*sec(d*x+c))^(1/2)-154/5*a^4*sin(d*x+c)*(e*sec(d*x+c))^(1/2)/d/e-4*
I*a*(a+I*a*tan(d*x+c))^3/d/(e*sec(d*x+c))^(1/2)-22/5*I*(e*sec(d*x+c))^(3/2)
*(a^4+I*a^4*tan(d*x+c))/d/e^2
```

Rubi [A] time = 0.19, antiderivative size = 178, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.214, Rules used = {3496, 3498, 3486, 3768, 3771, 2639}

$$-\frac{154ia^4(e\sec(c+dx))^{3/2}}{15de^2}-\frac{22i\left(a^4+ia^4\tan(c+dx)\right)(e\sec(c+dx))^{3/2}}{5de^2}-\frac{154a^4\sin(c+dx)\sqrt{e\sec(c+dx)}}{5de}+\frac{}{5d\sqrt{}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^4/Sqrt[e*Sec[c + d*x]],x]
```

```
[Out] (154*a^4*EllipticE[(c + d*x)/2, 2])/(5*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c +
d*x]]) - (((154*I)/15)*a^4*(e*Sec[c + d*x])^(3/2))/(d*e^2) - (154*a^4*Sqrt[
e*Sec[c + d*x]]*Sin[c + d*x])/(5*d*e) - ((4*I)*a*(a + I*a*Tan[c + d*x])^3)/
(d*Sqrt[e*Sec[c + d*x]]) - (((22*I)/5)*(e*Sec[c + d*x])^(3/2)*(a^4 + I*a^4*
Tan[c + d*x]))/(d*e^2)
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

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

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3498

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
```

```
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m}, x] && EqQ[a^2 + b^2, 0] && GtQ[n, 0] && NeQ[m + n - 1, 0] && IntegersQ[
2*m, 2*n]
```

Rule 3768

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^4}{\sqrt{e\sec(c+dx)}}\,dx = -\frac{4ia(a+ia\tan(c+dx))^3}{d\sqrt{e\sec(c+dx)}} - \frac{\left(11a^2\right)\int (e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^2\,dx}{e^2}$$

$$= -\frac{4ia(a+ia\tan(c+dx))^3}{d\sqrt{e\sec(c+dx)}} - \frac{22i(e\sec(c+dx))^{3/2}\left(a^4+ia^4\tan(c+dx)\right)}{5de^2} - \frac{\left(77a^3\right)\int (\cdots}{}$$

$$= -\frac{154ia^4(e\sec(c+dx))^{3/2}}{15de^2} - \frac{4ia(a+ia\tan(c+dx))^3}{d\sqrt{e\sec(c+dx)}} - \frac{22i(e\sec(c+dx))^{3/2}\left(a^4+ia\cdots\right.}{5de^2}$$

$$= -\frac{154ia^4(e\sec(c+dx))^{3/2}}{15de^2} - \frac{154a^4\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5de} - \frac{4ia(a+ia\tan(c+d\cdots}{d\sqrt{e\sec(c+dx)}}$$

$$= -\frac{154ia^4(e\sec(c+dx))^{3/2}}{15de^2} - \frac{154a^4\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5de} - \frac{4ia(a+ia\tan(c+d\cdots}{d\sqrt{e\sec(c+dx)}}$$

$$= \frac{154a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} - \frac{154ia^4(e\sec(c+dx))^{3/2}}{15de^2} - \frac{154a^4\sqrt{e\sec(c+dx)}\,\mathrm{s}\cdots}{5de}$$

Mathematica [C] time = 4.36, size = 123, normalized size = 0.69

$$-\frac{2ia^4e^{i(c+dx)}\left(77\left(1+e^{2i(c+dx)}\right)^{5/2}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)-176e^{2i(c+dx)}-111e^{4i(c+dx)}-77\right)\sqrt{e\sec(c+dx)}}{15de\left(1+e^{2i(c+dx)}\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^4/Sqrt[e*Sec[c + d*x]],x]
```

```
[Out] (((-2*I)/15)*a^4*E^(I*(c + d*x))*(-77 - 176*E^((2*I)*(c + d*x)) - 111*E^((4
*I)*(c + d*x)) + 77*(1 + E^((2*I)*(c + d*x)))^(5/2)*Hypergeometric2F1[1/2,
3/4, 7/4, -E^((2*I)*(c + d*x))])*Sqrt[e*Sec[c + d*x]])/(d*e*(1 + E^((2*I)*(
c + d*x)))^2)
```

fricas [F] time = 0.63, size = 0, normalized size = 0.00

$$\sqrt{2}\left(-240i\,a^4e^{(6i\,dx+6i\,c)}-222i\,a^4e^{(5i\,dx+5i\,c)}-1034i\,a^4e^{(4i\,dx+4i\,c)}-352i\,a^4e^{(3i\,dx+3i\,c)}-1232i\,a^4e^{(2i\,dx+2i\,c)}-154i\,a^4e^{(\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/15*(sqrt(2)*(-240*I*a^4*e^(6*I*d*x + 6*I*c) - 222*I*a^4*e^(5*I*d*x + 5*I*
c) - 1034*I*a^4*e^(4*I*d*x + 4*I*c) - 352*I*a^4*e^(3*I*d*x + 3*I*c) - 1232*
I*a^4*e^(2*I*d*x + 2*I*c) - 154*I*a^4*e^(I*d*x + I*c) - 462*I*a^4)*sqrt(e/(
e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 15*(d*e*e^(5*I*d*x + 5*
I*c) - d*e*e^(4*I*d*x + 4*I*c) + 2*d*e*e^(3*I*d*x + 3*I*c) - 2*d*e*e^(2*I*d
*x + 2*I*c) + d*e*e^(I*d*x + I*c) - d*e)*integral(1/5*sqrt(2)*(-77*I*a^4*e^
(2*I*d*x + 2*I*c) - 154*I*a^4*e^(I*d*x + I*c) - 77*I*a^4)*sqrt(e/(e^(2*I*d*
x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(d*e*e^(3*I*d*x + 3*I*c) - 2*d*e*e
^(2*I*d*x + 2*I*c) + d*e*e^(I*d*x + I*c)), x))/(d*e*e^(5*I*d*x + 5*I*c) - d
*e*e^(4*I*d*x + 4*I*c) + 2*d*e*e^(3*I*d*x + 3*I*c) - 2*d*e*e^(2*I*d*x + 2*I
*c) + d*e*e^(I*d*x + I*c) - d*e)
```

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

$$\int \frac{(i\,a\tan\left(dx+c\right)+a)^4}{\sqrt{e\sec\left(dx+c\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^4/sqrt(e*sec(d*x + c)), x)
```

maple [B] time = 1.05, size = 1618, normalized size = 9.09

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(1/2),x)
```

```
[Out] -2/15*a^4/d*(-1+cos(d*x+c))^3*(231*I*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*(
1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^6*sin(
d*x+c)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-231*I*(-cos(d*x+c)/(1+cos(
d*x+c))^2)^(3/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*cos(d*x+c)^6*sin(d*x+c)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)+924*I*(-
cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+
cos(d*x+c)))^(1/2)*cos(d*x+c)^5*sin(d*x+c)*EllipticF(I*(-1+cos(d*x+c))/sin(
d*x+c),I)-924*I*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*(1/(1+cos(d*x+c)))^(1/
2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^5*sin(d*x+c)*EllipticE(I*(-
1+cos(d*x+c))/sin(d*x+c),I)+1386*I*cos(d*x+c)^4*sin(d*x+c)*(-cos(d*x+c)/(1+
cos(d*x+c))^2)^(3/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(
1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-1386*I*(-cos(d*x+c)/(1+cos(d
*x+c))^2)^(3/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*
cos(d*x+c)^4*sin(d*x+c)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)+924*I*(-c
os(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)*cos(d*x+c)^3*sin(d*x+c)*EllipticF(I*(-1+cos(d*x+c))/sin(d
*x+c),I)-924*I*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*(1/(1+cos(d*x+c)))^(1/2
)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)^3*sin(d*x+c)*EllipticE(I*(-1
+cos(d*x+c))/sin(d*x+c),I)+231*I*cos(d*x+c)^2*sin(d*x+c)*(-cos(d*x+c)/(1+co
s(d*x+c))^2)^(3/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/
2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-231*I*(-cos(d*x+c)/(1+cos(d*x+
c))^2)^(3/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos
(d*x+c)^2*sin(d*x+c)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)-120*cos(d*x+
c)^7*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)-120*I*cos(d*x+c)^6*sin(d*x+c)*(-c
os(d*x+c)/(1+cos(d*x+c))^2)^(3/2)-360*I*cos(d*x+c)^5*sin(d*x+c)*(-cos(d*x+c
)/(1+cos(d*x+c))^2)^(3/2)-380*I*cos(d*x+c)^4*sin(d*x+c)*(-cos(d*x+c)/(1+cos
```

```
(d*x+c))^2)^(3/2)-180*I*cos(d*x+c)^3*sin(d*x+c)*(-cos(d*x+c)/(1+cos(d*x+c))
^2)^(3/2)+30*I*cos(d*x+c)^4*sin(d*x+c)*ln(-(2*cos(d*x+c)^2*(-cos(d*x+c)/(1+
cos(d*x+c))^2)^(1/2)-cos(d*x+c)^2+2*cos(d*x+c)-2*(-cos(d*x+c)/(1+cos(d*x+c)
)^2)^(1/2)-1)/sin(d*x+c)^2)-30*I*cos(d*x+c)^4*sin(d*x+c)*ln(-2*(2*cos(d*x+c
)^2*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)-cos(d*x+c)^2+2*cos(d*x+c)-2*(-cos(
d*x+c)/(1+cos(d*x+c))^2)^(1/2)-1)/sin(d*x+c)^2)-60*I*cos(d*x+c)^2*sin(d*x+c
)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)-20*I*cos(d*x+c)*sin(d*x+c)*(-cos(d*x
+c)/(1+cos(d*x+c))^2)^(3/2)+3*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)-129*cos(
d*x+c)^6*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)+219*cos(d*x+c)^5*(-cos(d*x+c)
/(1+cos(d*x+c))^2)^(3/2)+231*cos(d*x+c)^4*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3
/2)-108*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*cos(d*x+c)^3-105*(-cos(d*x+c)/
(1+cos(d*x+c))^2)^(3/2)*cos(d*x+c)^2+9*cos(d*x+c)*(-cos(d*x+c)/(1+cos(d*x+c
))^2)^(3/2))/cos(d*x+c)^3/sin(d*x+c)^7/(e/cos(d*x+c))^(1/2)/(-cos(d*x+c)/(1
+cos(d*x+c))^2)^(3/2)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^4}{\sqrt{e\sec(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^4/sqrt(e*sec(d*x + c)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+a\tan(c+d\,x)\,1\mathrm{i})^4}{\sqrt{\frac{e}{\cos(c+d\,x)}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^4/(e/cos(c + d*x))^(1/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^4/(e/cos(c + d*x))^(1/2), x)
```

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

$$a^4\left(\int \frac{1}{\sqrt{e\sec(c+dx)}}\,dx+\int\left(-\frac{6\tan^2(c+dx)}{\sqrt{e\sec(c+dx)}}\right)dx+\int \frac{\tan^4(c+dx)}{\sqrt{e\sec(c+dx)}}\,dx+\int \frac{4i\tan(c+dx)}{\sqrt{e\sec(c+dx)}}\,dx+\int\left(-\frac{4\ldots}{\ldots}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**4/(e*sec(d*x+c))**(1/2),x)
```

```
[Out] a**4*(Integral(1/sqrt(e*sec(c + d*x)), x) + Integral(-6*tan(c + d*x)**2/sqr
t(e*sec(c + d*x)), x) + Integral(tan(c + d*x)**4/sqrt(e*sec(c + d*x)), x) +
 Integral(4*I*tan(c + d*x)/sqrt(e*sec(c + d*x)), x) + Integral(-4*I*tan(c +
 d*x)**3/sqrt(e*sec(c + d*x)), x))
```

3.216 $\int \frac{(a+ia\tan(c+dx))^4}{(e\sec(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=146

$$-\frac{10ia^4\sqrt{e\sec(c+dx)}}{de^2}-\frac{2i\left(a^4+ia^4\tan(c+dx)\right)\sqrt{e\sec(c+dx)}}{de^2}-\frac{10a^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{de^2}$$

```
[Out] -10*I*a^4*(e*sec(d*x+c))^(1/2)/d/e^2-10*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/co
s(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*
sec(d*x+c))^(1/2)/d/e^2-4/3*I*a*(a+I*a*tan(d*x+c))^3/d/(e*sec(d*x+c))^(3/2)
-2*I*(e*sec(d*x+c))^(1/2)*(a^4+I*a^4*tan(d*x+c))/d/e^2
```

Rubi [A] time = 0.15, antiderivative size = 146, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used = {3496, 3498, 3486, 3771, 2641}

$$-\frac{10ia^4\sqrt{e\sec(c+dx)}}{de^2}-\frac{2i\left(a^4+ia^4\tan(c+dx)\right)\sqrt{e\sec(c+dx)}}{de^2}-\frac{10a^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{de^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^4/(e*Sec[c + d*x])^(3/2),x]
```

```
[Out] ((-10*I)*a^4*Sqrt[e*Sec[c + d*x]])/(d*e^2) - (10*a^4*Sqrt[Cos[c + d*x]]*Ell
ipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(d*e^2) - (((4*I)/3)*a*(a + I*
a*Tan[c + d*x])^3)/(d*(e*Sec[c + d*x])^(3/2)) - ((2*I)*Sqrt[e*Sec[c + d*x]]
*(a^4 + I*a^4*Tan[c + d*x]))/(d*e^2)
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

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

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3498

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

```
2*m, 2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^4}{(e\sec(c+dx))^{3/2}}\,dx = -\frac{4ia(a+ia\tan(c+dx))^3}{3d(e\sec(c+dx))^{3/2}} - \frac{(3a^2)\int \sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^2\,dx}{e^2}$$

$$= -\frac{4ia(a+ia\tan(c+dx))^3}{3d(e\sec(c+dx))^{3/2}} - \frac{2i\sqrt{e\sec(c+dx)}\left(a^4+ia^4\tan(c+dx)\right)}{de^2} - \frac{(5a^3)\int \sqrt{e\,\mathrm{s}}}{}$$

$$= -\frac{10ia^4\sqrt{e\sec(c+dx)}}{de^2} - \frac{4ia(a+ia\tan(c+dx))^3}{3d(e\sec(c+dx))^{3/2}} - \frac{2i\sqrt{e\sec(c+dx)}\left(a^4+ia^4\tan(\right.}{de^2}$$

$$= -\frac{10ia^4\sqrt{e\sec(c+dx)}}{de^2} - \frac{4ia(a+ia\tan(c+dx))^3}{3d(e\sec(c+dx))^{3/2}} - \frac{2i\sqrt{e\sec(c+dx)}\left(a^4+ia^4\tan(\right.}{de^2}$$

$$= -\frac{10ia^4\sqrt{e\sec(c+dx)}}{de^2} - \frac{10a^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{de^2} - \frac{4ia(a}{3d(}$$

Mathematica [A] time = 1.39, size = 130, normalized size = 0.89

$$\frac{a^4\sec^3(c+dx)(\sin(c+5dx)-i\cos(c+5dx))\left(-11i\sin(2(c+dx))+19\cos(2(c+dx))-30i\cos^{\frac{3}{2}}(c+dx)F\left(\frac{1}{2}(c+\right.\right.}{3d(\cos(dx)+i\sin(dx))^4(e\sec(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^4/(e*Sec[c + d*x])^(3/2),x]
```

```
[Out] (a^4*Sec[c + d*x]^3*(21 + 19*Cos[2*(c + d*x)] - (30*I)*Cos[c + d*x]^(3/2)*E
llipticF[(c + d*x)/2, 2]*(Cos[c + d*x] - I*Sin[c + d*x]) - (11*I)*Sin[2*(c
+ d*x)])*((-I)*Cos[c + 5*d*x] + Sin[c + 5*d*x]))/(3*d*(e*Sec[c + d*x])^(3/2
)*(Cos[d*x] + I*Sin[d*x])^4)
```

fricas [F] time = 0.70, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-8i\,a^4e^{(4i\,dx+4i\,c)}-42i\,a^4e^{(2i\,dx+2i\,c)}-30i\,a^4\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+3\left(de^2e^{(2i\,dx+2i\,c)}+de^2\right)\mathrm{integral}\left(\frac{5i\sqrt{2}a^4}{}\right.}{3\left(de^2e^{(2i\,dx+2i\,c)}+de^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/3*(sqrt(2)*(-8*I*a^4*e^(4*I*d*x + 4*I*c) - 42*I*a^4*e^(2*I*d*x + 2*I*c) -
 30*I*a^4)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 3*(d
*e^2*e^(2*I*d*x + 2*I*c) + d*e^2)*integral(5*I*sqrt(2)*a^4*sqrt(e/(e^(2*I*d
*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(d*e^2), x))/(d*e^2*e^(2*I*d*x +
 2*I*c) + d*e^2)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^4}{(e\sec(dx+c))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^4/(e*sec(d*x + c))^(3/2), x)
```

maple [A] time = 0.97, size = 200, normalized size = 1.37

$$-\frac{2a^4\left(15i\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\left(\cos^2(dx+c)\right)\mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)+15i\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right.}{3d\,\mathrm{co}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(3/2),x)
```

```
[Out] -2/3*a^4/d*(15*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)^2+15*I*(1/(1+cos(d*x+
c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/si
n(d*x+c),I)*cos(d*x+c)+8*I*cos(d*x+c)^3-8*cos(d*x+c)^2*sin(d*x+c)+12*I*cos(
d*x+c)-sin(d*x+c))/cos(d*x+c)^3/(e/cos(d*x+c))^(3/2)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^4}{(e\sec(dx+c))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^4/(e*sec(d*x + c))^(3/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+a\tan(c+d\,x)\,1\mathrm{i})^4}{\left(\frac{e}{\cos(c+d\,x)}\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^4/(e/cos(c + d*x))^(3/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^4/(e/cos(c + d*x))^(3/2), x)
```

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

$$a^4\left(\int \frac{1}{(e\sec(c+dx))^{\frac{3}{2}}}\,dx+\int\left(-\frac{6\tan^2(c+dx)}{(e\sec(c+dx))^{\frac{3}{2}}}\right)dx+\int \frac{\tan^4(c+dx)}{(e\sec(c+dx))^{\frac{3}{2}}}\,dx+\int \frac{4i\tan(c+dx)}{(e\sec(c+dx))^{\frac{3}{2}}}\,dx+\int\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**4/(e*sec(d*x+c))**(3/2),x)
```

```
[Out] a**4*(Integral((e*sec(c + d*x))**(-3/2), x) + Integral(-6*tan(c + d*x)**2/(
e*sec(c + d*x))**(3/2), x) + Integral(tan(c + d*x)**4/(e*sec(c + d*x))**(3/
2), x) + Integral(4*I*tan(c + d*x)/(e*sec(c + d*x))**(3/2), x) + Integral(-
4*I*tan(c + d*x)**3/(e*sec(c + d*x))**(3/2), x))
```

3.217 $\int \frac{(a+ia\tan(c+dx))^4}{(e\sec(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=156

$$\frac{42a^4\sin(c+dx)\sqrt{e\sec(c+dx)}}{5de^3}+\frac{28i\left(a^4+ia^4\tan(c+dx)\right)}{5de^2\sqrt{e\sec(c+dx)}}-\frac{42a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5de^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{4ia(a+ia\tan(c+ \cdots}{5d(e\sec(c+d\cdots}$$

```
[Out] -42/5*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2
*d*x+1/2*c),2^(1/2))/d/e^2/cos(d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)+42/5*a^4*s
in(d*x+c)*(e*sec(d*x+c))^(1/2)/d/e^3-4/5*I*a*(a+I*a*tan(d*x+c))^3/d/(e*sec(
d*x+c))^(5/2)+28/5*I*(a^4+I*a^4*tan(d*x+c))/d/e^2/(e*sec(d*x+c))^(1/2)
```

Rubi [A] time = 0.14, antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3496, 3768, 3771, 2639}

$$\frac{42a^4\sin(c+dx)\sqrt{e\sec(c+dx)}}{5de^3}+\frac{28i\left(a^4+ia^4\tan(c+dx)\right)}{5de^2\sqrt{e\sec(c+dx)}}-\frac{42a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5de^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{4ia(a+ia\tan(c+ \cdots}{5d(e\sec(c+d\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^4/(e*Sec[c + d*x])^(5/2),x]
```

```
[Out] (-42*a^4*EllipticE[(c + d*x)/2, 2])/(5*d*e^2*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[
c + d*x]]) + (42*a^4*Sqrt[e*Sec[c + d*x]]*Sin[c + d*x])/(5*d*e^3) - (((4*I)
/5)*a*(a + I*a*Tan[c + d*x])^3)/(d*(e*Sec[c + d*x])^(5/2)) + (((28*I)/5)*(a
^4 + I*a^4*Tan[c + d*x]))/(d*e^2*Sqrt[e*Sec[c + d*x]])
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3768

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^4}{(e\sec(c+dx))^{5/2}}\,dx = -\frac{4ia(a+ia\tan(c+dx))^3}{5d(e\sec(c+dx))^{5/2}} - \frac{(7a^2)\int \frac{(a+ia\tan(c+dx))^2}{\sqrt{e\sec(c+dx)}}\,dx}{5e^2}$$

$$= -\frac{4ia(a+ia\tan(c+dx))^3}{5d(e\sec(c+dx))^{5/2}} + \frac{28i\left(a^4+ia^4\tan(c+dx)\right)}{5de^2\sqrt{e\sec(c+dx)}} + \frac{(21a^4)\int(e\sec(c+dx))}{5e^4}$$

$$= \frac{42a^4\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5de^3} - \frac{4ia(a+ia\tan(c+dx))^3}{5d(e\sec(c+dx))^{5/2}} + \frac{28i\left(a^4+ia^4\tan(c\right.}{5de^2\sqrt{e\sec(c+}}$$

$$= \frac{42a^4\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5de^3} - \frac{4ia(a+ia\tan(c+dx))^3}{5d(e\sec(c+dx))^{5/2}} + \frac{28i\left(a^4+ia^4\tan(c\right.}{5de^2\sqrt{e\sec(c+}}$$

$$= -\frac{42a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5de^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} + \frac{42a^4\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5de^3} - \frac{4ia(a+}{5d(e\,s}$$

Mathematica [C] time = 2.79, size = 110, normalized size = 0.71

$$-\frac{4ia^4e^{2i(c+dx)}\left(-7\sqrt{1+e^{2i(c+dx)}}\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)+2e^{2i(c+dx)}+7\right)}{5de^2\left(1+e^{2i(c+dx)}\right)\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^4/(e*Sec[c + d*x])^(5/2),x]
```

```
[Out] (((-4*I)/5)*a^4*E^((2*I)*(c + d*x))*(7 + 2*E^((2*I)*(c + d*x)) - 7*Sqrt[1 +
 E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x))
]))/(d*e^2*(1 + E^((2*I)*(c + d*x)))*Sqrt[e*Sec[c + d*x]])
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-4i\,a^4e^{(4i\,dx+4i\,c)}+4i\,a^4e^{(3i\,dx+3i\,c)}+28i\,a^4e^{(2i\,dx+2i\,c)}+14i\,a^4e^{(i\,dx+i\,c)}+42i\,a^4\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+5\,(}{5\left(de^3e^{(i\,dx+i\,c)}-de^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/5*(sqrt(2)*(-4*I*a^4*e^(4*I*d*x + 4*I*c) + 4*I*a^4*e^(3*I*d*x + 3*I*c) +
28*I*a^4*e^(2*I*d*x + 2*I*c) + 14*I*a^4*e^(I*d*x + I*c) + 42*I*a^4)*sqrt(e/
(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 5*(d*e^3*e^(I*d*x + I*
c) - d*e^3)*integral(1/5*sqrt(2)*(21*I*a^4*e^(2*I*d*x + 2*I*c) + 42*I*a^4*e
^(I*d*x + I*c) + 21*I*a^4)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x +
 1/2*I*c)/(d*e^3*e^(3*I*d*x + 3*I*c) - 2*d*e^3*e^(2*I*d*x + 2*I*c) + d*e^3*
e^(I*d*x + I*c)), x))/(d*e^3*e^(I*d*x + I*c) - d*e^3)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^4}{(e\sec(dx+c))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^4/(e*sec(d*x + c))^(5/2), x)
```

maple [B] time = 1.07, size = 2196, normalized size = 14.08

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(5/2),x)
```

```
[Out] 1/10*a^4/d*(-1+cos(d*x+c))^3*(32*I*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*cos
(d*x+c)^6*sin(d*x+c)+96*I*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*cos(d*x+c)^5
*sin(d*x+c)+16*I*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*cos(d*x+c)^4*sin(d*x+
c)-208*I*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*cos(d*x+c)^3*sin(d*x+c)-240*I
*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*cos(d*x+c)^2*sin(d*x+c)-80*I*(-cos(d*
x+c)/(1+cos(d*x+c))^2)^(3/2)*cos(d*x+c)*sin(d*x+c)-20*I*cos(d*x+c)^2*ln(-(2
*cos(d*x+c)^2*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)-cos(d*x+c)^2+2*cos(d*x+c
)-2*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)-1)/sin(d*x+c)^2)*sin(d*x+c)+20*I*c
os(d*x+c)^2*ln(-2*(2*cos(d*x+c)^2*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)-cos(
d*x+c)^2+2*cos(d*x+c)-2*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)-1)/sin(d*x+c)^
2)*sin(d*x+c)+63*I*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*(1/(1+cos(d*x+c)))^
(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x
+c),I)*sin(d*x+c)-84*I*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*(1/(1+cos(d*x+c
)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin
(d*x+c),I)*sin(d*x+c)-21*I*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*(1/(1+cos(d
*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))
/sin(d*x+c),I)*cos(d*x+c)^6*sin(d*x+c)-231*I*(-cos(d*x+c)/(1+cos(d*x+c))^2)
^(3/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF
(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)^4*sin(d*x+c)+32*cos(d*x+c)^7*(-
cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)-20*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)+
96*cos(d*x+c)^6*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)-172*cos(d*x+c)^4*(-cos
(d*x+c)/(1+cos(d*x+c))^2)^(3/2)-56*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*cos
(d*x+c)^3+96*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*cos(d*x+c)^2+24*cos(d*x+c
)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)-84*I*(-cos(d*x+c)/(1+cos(d*x+c))^2)^
(3/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(
I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)^4*sin(d*x+c)-21*I*cos(d*x+c)^5*s
in(d*x+c)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)*(1/(1+cos(d*x+c)))^(1/2)*(co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-33
6*I*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+
c)^3*sin(d*x+c)-84*I*cos(d*x+c)^4*sin(d*x+c)*(-cos(d*x+c)/(1+cos(d*x+c))^2)
^(1/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF
(I*(-1+cos(d*x+c))/sin(d*x+c),I)+189*I*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)
*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1
+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)^2*sin(d*x+c)-504*I*(-cos(d*x+c)/(1+co
s(d*x+c))^2)^(3/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/
2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)^2*sin(d*x+c)-126*I*
(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)^3
*sin(d*x+c)+210*I*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*(1/(1+cos(d*x+c)))^(
1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+
c),I)*cos(d*x+c)*sin(d*x+c)-336*I*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*(1/(
1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(
d*x+c))/sin(d*x+c),I)*cos(d*x+c)*sin(d*x+c)-84*I*(-cos(d*x+c)/(1+cos(d*x+c)
)^2)^(1/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Ellip
ticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)^2*sin(d*x+c)-84*I*(-cos(d*x
+c)/(1+cos(d*x+c))^2)^(3/2)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x
+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)^3*sin(d*x+
c)-21*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Elliptic
F(I*(-1+cos(d*x+c))/sin(d*x+c),I)*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(1/2)*cos(
d*x+c)*sin(d*x+c)-126*I*(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)*(1/(1+cos(d*x+
```

```
c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/si
n(d*x+c),I)*cos(d*x+c)^5*sin(d*x+c))/cos(d*x+c)^3/sin(d*x+c)^7/(e/cos(d*x+c
))^(5/2)/(-cos(d*x+c)/(1+cos(d*x+c))^2)^(3/2)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^4}{(e\sec(dx+c))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^4/(e*sec(d*x + c))^(5/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+a\tan(c+d\,x)\,1\mathrm{i})^4}{\left(\frac{e}{\cos(c+d\,x)}\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^4/(e/cos(c + d*x))^(5/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^4/(e/cos(c + d*x))^(5/2), x)
```

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

$$a^4\left(\int \frac{1}{(e\sec(c+dx))^{\frac{5}{2}}}\,dx + \int \left(-\frac{6\tan^2(c+dx)}{(e\sec(c+dx))^{\frac{5}{2}}}\right)dx + \int \frac{\tan^4(c+dx)}{(e\sec(c+dx))^{\frac{5}{2}}}\,dx + \int \frac{4i\tan(c+dx)}{(e\sec(c+dx))^{\frac{5}{2}}}\,dx + \int$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**4/(e*sec(d*x+c))**(5/2),x)
```

```
[Out] a**4*(Integral((e*sec(c + d*x))**(-5/2), x) + Integral(-6*tan(c + d*x)**2/(
e*sec(c + d*x))**(5/2), x) + Integral(tan(c + d*x)**4/(e*sec(c + d*x))**(5/
2), x) + Integral(4*I*tan(c + d*x)/(e*sec(c + d*x))**(5/2), x) + Integral(-
4*I*tan(c + d*x)**3/(e*sec(c + d*x))**(5/2), x))
```

3.218 $\int \frac{(a+ia\tan(c+dx))^4}{(e\sec(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=125

$$\frac{10a^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{21de^4}+\frac{20i\left(a^4+ia^4\tan(c+dx)\right)}{21de^2(e\sec(c+dx))^{3/2}}-\frac{4ia(a+ia\tan(c+dx))^3}{7d(e\sec(c+dx))^{7/2}}$$

```
[Out] 10/21*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2
*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(d*x+c))^(1/2)/d/e^4-4/7*I*a*(a
+I*a*tan(d*x+c))^3/d/(e*sec(d*x+c))^(7/2)+20/21*I*(a^4+I*a^4*tan(d*x+c))/d/
e^2/(e*sec(d*x+c))^(3/2)
```

Rubi [A] time = 0.13, antiderivative size = 125, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.107$, Rules used = {3496, 3771, 2641}

$$\frac{20i\left(a^4+ia^4\tan(c+dx)\right)}{21de^2(e\sec(c+dx))^{3/2}}+\frac{10a^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{21de^4}-\frac{4ia(a+ia\tan(c+dx))^3}{7d(e\sec(c+dx))^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^4/(e*Sec[c + d*x])^(7/2),x]
```

```
[Out] (10*a^4*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/
(21*d*e^4) - (((4*I)/7)*a*(a + I*a*Tan[c + d*x])^3)/(d*(e*Sec[c + d*x])^(7/
2)) + (((20*I)/21)*(a^4 + I*a^4*Tan[c + d*x]))/(d*e^2*(e*Sec[c + d*x])^(3/2
))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^4}{(e\sec(c+dx))^{7/2}}\,dx = -\frac{4ia(a+ia\tan(c+dx))^3}{7d(e\sec(c+dx))^{7/2}} - \frac{\left(5a^2\right)\int \frac{(a+ia\tan(c+dx))^2}{(e\sec(c+dx))^{3/2}}\,dx}{7e^2}$$

$$= -\frac{4ia(a+ia\tan(c+dx))^3}{7d(e\sec(c+dx))^{7/2}} + \frac{20i\left(a^4+ia^4\tan(c+dx)\right)}{21de^2(e\sec(c+dx))^{3/2}} + \frac{\left(5a^4\right)\int \sqrt{e\sec(c+dx)}$$

$$= -\frac{4ia(a+ia\tan(c+dx))^3}{7d(e\sec(c+dx))^{7/2}} + \frac{20i\left(a^4+ia^4\tan(c+dx)\right)}{21de^2(e\sec(c+dx))^{3/2}} + \frac{\left(5a^4\sqrt{\cos(c+dx)}\sqrt{e\,\mathrm{se}}$$

$$= \frac{10a^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{21de^4} - \frac{4ia(a+ia\tan(c+dx))^3}{7d(e\sec(c+dx))^{7/2}} +$$

Mathematica [A] time = 1.23, size = 133, normalized size = 1.06

$$\frac{2a^4\sqrt{e\sec(c+dx)}\,(\cos(2(c+3dx))+i\sin(2(c+3dx)))\left(8\sin(2(c+dx))+2i\cos(2(c+dx))+5\sqrt{\cos(c+dx)}\right.}{21de^4(\cos(dx)+i\sin(dx))^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^4/(e*Sec[c + d*x])^(7/2),x]
```

```
[Out] (2*a^4*Sqrt[e*Sec[c + d*x]]*(2*I + (2*I)*Cos[2*(c + d*x)] + 5*Sqrt[Cos[c +
d*x]]*EllipticF[(c + d*x)/2, 2]*(Cos[2*(c + d*x)] - I*Sin[2*(c + d*x)]) + 8
*Sin[2*(c + d*x)])*(Cos[2*(c + 3*d*x)] + I*Sin[2*(c + 3*d*x)]))/(21*d*e^4*(
Cos[d*x] + I*Sin[d*x])^4)
```

fricas [F] time = 0.63, size = 0, normalized size = 0.00

$$\frac{21\,de^4\mathrm{integral}\left(-\frac{5i\sqrt{2}\,a^4\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{21\,de^4},x\right)+\sqrt{2}\left(-6i\,a^4e^{(4i\,dx+4i\,c)}+4i\,a^4e^{(2i\,dx+2i\,c)}+10i\,a^4\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+}}}{21\,de^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/21*(21*d*e^4*integral(-5/21*I*sqrt(2)*a^4*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1
))*e^(-1/2*I*d*x - 1/2*I*c)/(d*e^4), x) + sqrt(2)*(-6*I*a^4*e^(4*I*d*x + 4*
I*c) + 4*I*a^4*e^(2*I*d*x + 2*I*c) + 10*I*a^4)*sqrt(e/(e^(2*I*d*x + 2*I*c)
+ 1))*e^(1/2*I*d*x + 1/2*I*c))/(d*e^4)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^4}{(e\sec(dx+c))^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^4/(e*sec(d*x + c))^(7/2), x)
```

maple [A] time = 0.92, size = 200, normalized size = 1.60

$$-\frac{2a^4\left(24i\left(\cos^4(dx+c)\right)-5i\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)\cos(dx+c)-24\left(\cos^3(d\right.}{21d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(7/2),x)
```

```
[Out] -2/21*a^4/d*(24*I*cos(d*x+c)^4-5*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+
cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)-24*
cos(d*x+c)^3*sin(d*x+c)-5*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x
+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-28*I*cos(d*x+c)^2+16*
cos(d*x+c)*sin(d*x+c))/cos(d*x+c)^4/(e/cos(d*x+c))^(7/2)
```

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

$$\int \frac{(i\,a\tan\left(dx+c\right)+a)^4}{(e\sec\left(dx+c\right))^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^4/(e*sec(d*x + c))^(7/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+a\tan\left(c+d\,x\right)\,1\mathrm{i})^4}{\left(\frac{e}{\cos(c+d\,x)}\right)^{7/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^4/(e/cos(c + d*x))^(7/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^4/(e/cos(c + d*x))^(7/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**4/(e*sec(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.219 $\int \frac{(a+ia\tan(c+dx))^4}{(e\sec(c+dx))^{9/2}}\,dx$

Optimal. Leaf size=125

$$-\frac{2a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15de^4\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{4i\left(a^4+ia^4\tan(c+dx)\right)}{15de^2(e\sec(c+dx))^{5/2}}-\frac{4ia(a+ia\tan(c+dx))^3}{9d(e\sec(c+dx))^{9/2}}$$

```
[Out] -2/15*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2
*d*x+1/2*c),2^(1/2))/d/e^4/cos(d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)-4/9*I*a*(a
+I*a*tan(d*x+c))^3/d/(e*sec(d*x+c))^(9/2)+4/15*I*(a^4+I*a^4*tan(d*x+c))/d/e
^2/(e*sec(d*x+c))^(5/2)
```

Rubi [A] time = 0.13, antiderivative size = 125, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.107, Rules used = {3496, 3771, 2639}

$$\frac{4i\left(a^4+ia^4\tan(c+dx)\right)}{15de^2(e\sec(c+dx))^{5/2}}-\frac{2a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15de^4\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{4ia(a+ia\tan(c+dx))^3}{9d(e\sec(c+dx))^{9/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^4/(e*Sec[c + d*x])^(9/2),x]
```

```
[Out] (-2*a^4*EllipticE[(c + d*x)/2, 2])/(15*d*e^4*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[
c + d*x]]) - (((4*I)/9)*a*(a + I*a*Tan[c + d*x])^3)/(d*(e*Sec[c + d*x])^(9/
2)) + (((4*I)/15)*(a^4 + I*a^4*Tan[c + d*x]))/(d*e^2*(e*Sec[c + d*x])^(5/2)
)
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^4}{(e\sec(c+dx))^{9/2}}dx = -\frac{4ia(a+ia\tan(c+dx))^3}{9d(e\sec(c+dx))^{9/2}} - \frac{a^2\int\frac{(a+ia\tan(c+dx))^2}{(e\sec(c+dx))^{5/2}}dx}{3e^2}$$

$$= -\frac{4ia(a+ia\tan(c+dx))^3}{9d(e\sec(c+dx))^{9/2}} + \frac{4i\left(a^4+ia^4\tan(c+dx)\right)}{15de^2(e\sec(c+dx))^{5/2}} - \frac{a^4\int\frac{1}{\sqrt{e\sec(c+dx)}}dx}{15e^4}$$

$$= -\frac{4ia(a+ia\tan(c+dx))^3}{9d(e\sec(c+dx))^{9/2}} + \frac{4i\left(a^4+ia^4\tan(c+dx)\right)}{15de^2(e\sec(c+dx))^{5/2}} - \frac{a^4\int\sqrt{\cos(c+dx)}\,dx}{15e^4\sqrt{\cos(c+dx)}\sqrt{e\sec(c}$$

$$= -\frac{2a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15de^4\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} - \frac{4ia(a+ia\tan(c+dx))^3}{9d(e\sec(c+dx))^{9/2}} + \frac{4i\left(a^4+ia^4\tan(c\right.}{15de^2(e\sec(c+}$$

Mathematica [C] time = 3.95, size = 108, normalized size = 0.86

$$-\frac{ia^4e^{i(c+dx)}\left(-2\sqrt{1+e^{2i(c+dx)}}\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)+7e^{2i(c+dx)}+5e^{4i(c+dx)}+2\right)\sqrt{e\sec(c+dx)}}{45de^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^4/(e*Sec[c + d*x])^(9/2),x]
```

```
[Out] ((-1/45*I)*a^4*E^(I*(c + d*x))*(2 + 7*E^((2*I)*(c + d*x)) + 5*E^((4*I)*(c +
 d*x)) - 2*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/2, 3/4, 7/4, -
E^((2*I)*(c + d*x))])*Sqrt[e*Sec[c + d*x]])/(d*e^5)
```

fricas [F] time = 0.63, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-5i\,a^4e^{(6i\,dx+6i\,c)}+5i\,a^4e^{(5i\,dx+5i\,c)}-7i\,a^4e^{(4i\,dx+4i\,c)}+7i\,a^4e^{(3i\,dx+3i\,c)}+4i\,a^4e^{(2i\,dx+2i\,c)}+2i\,a^4e^{(i\,dx+i\,c)}+6i\,a^4\right)\sqrt{}}{45\left(de^5e^{(i\,dx+}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(9/2),x, algorithm="fricas")
```

```
[Out] 1/45*(sqrt(2)*(-5*I*a^4*e^(6*I*d*x + 6*I*c) + 5*I*a^4*e^(5*I*d*x + 5*I*c) -
 7*I*a^4*e^(4*I*d*x + 4*I*c) + 7*I*a^4*e^(3*I*d*x + 3*I*c) + 4*I*a^4*e^(2*I
*d*x + 2*I*c) + 2*I*a^4*e^(I*d*x + I*c) + 6*I*a^4)*sqrt(e/(e^(2*I*d*x + 2*I
*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 45*(d*e^5*e^(I*d*x + I*c) - d*e^5)*inte
gral(1/15*sqrt(2)*(I*a^4*e^(2*I*d*x + 2*I*c) + 2*I*a^4*e^(I*d*x + I*c) + I*
a^4)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(d*e^5*e^(3*
I*d*x + 3*I*c) - 2*d*e^5*e^(2*I*d*x + 2*I*c) + d*e^5*e^(I*d*x + I*c)), x))/
(d*e^5*e^(I*d*x + I*c) - d*e^5)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^4}{(e\sec(dx+c))^{\frac{9}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(9/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^4/(e*sec(d*x + c))^(9/2), x)
```

maple [B] time = 0.96, size = 370, normalized size = 2.96

$$-\frac{2a^4\left(40i\left(\cos^5\left(dx+c\right)\right)\sin\left(dx+c\right)+40\left(\cos^6\left(dx+c\right)\right)-3i\cos\left(dx+c\right)\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \text{Elliptic}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(9/2),x)

[Out] -2/45*a^4/d*(40*I*cos(d*x+c)^5*sin(d*x+c)+40*cos(d*x+c)^6-3*I*sin(d*x+c)*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)+3*I*sin(d*x+c)*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-36*I*cos(d*x+c)^3*sin(d*x+c)-3*I*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)+3*I*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-56*cos(d*x+c)^4+13*cos(d*x+c)^2+3*cos(d*x+c))/cos(d*x+c)^5/sin(d*x+c)/(e/cos(d*x+c))^(9/2)

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

$$\int \frac{(i\,a\tan\left(dx+c\right)+a)^4}{(e\sec\left(dx+c\right))^{\frac{9}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(9/2),x, algorithm="maxima")

[Out] integrate((I*a*tan(d*x + c) + a)^4/(e*sec(d*x + c))^(9/2), x)

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+a\tan\left(c+d\,x\right)\,1\mathrm{i})^4}{\left(\frac{e}{\cos(c+d\,x)}\right)^{9/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a + a*tan(c + d*x)*1i)^4/(e/cos(c + d*x))^(9/2),x)

[Out] int((a + a*tan(c + d*x)*1i)^4/(e/cos(c + d*x))^(9/2), x)

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+I*a*tan(d*x+c))**4/(e*sec(d*x+c))**(9/2),x)

[Out] Timed out

3.220 $\int \frac{(a+ia\tan(c+dx))^4}{(e\sec(c+dx))^{11/2}}\,dx$

Optimal. Leaf size=156

$$-\frac{2a^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{77de^6}-\frac{2a^4\sin(c+dx)}{77de^5\sqrt{e\sec(c+dx)}}+\frac{4i\left(a^4+ia^4\tan(c+dx)\right)}{77de^2(e\sec(c+dx))^{7/2}}-\frac{4ia(a+ia\,\text{ta}}{11d(e\sec(}$$

```
[Out] -2/77*a^4*sin(d*x+c)/d/e^5/(e*sec(d*x+c))^(1/2)-2/77*a^4*(cos(1/2*d*x+1/2*c
)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x
+c)^(1/2)*(e*sec(d*x+c))^(1/2)/d/e^6-4/11*I*a*(a+I*a*tan(d*x+c))^3/d/(e*sec
(d*x+c))^(11/2)+4/77*I*(a^4+I*a^4*tan(d*x+c))/d/e^2/(e*sec(d*x+c))^(7/2)
```

Rubi [A] time = 0.15, antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3496, 3769, 3771, 2641}

$$-\frac{2a^4\sin(c+dx)}{77de^5\sqrt{e\sec(c+dx)}}+\frac{4i\left(a^4+ia^4\tan(c+dx)\right)}{77de^2(e\sec(c+dx))^{7/2}}-\frac{2a^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{77de^6}-\frac{4ia(a+ia\,\text{ta}}{11d(e\sec(}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^4/(e*Sec[c + d*x])^(11/2),x]
```

```
[Out] (-2*a^4*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/
(77*d*e^6) - (2*a^4*Sin[c + d*x])/(77*d*e^5*Sqrt[e*Sec[c + d*x]]) - (((4*I)
/11)*a*(a + I*a*Tan[c + d*x])^3)/(d*(e*Sec[c + d*x])^(11/2)) + (((4*I)/77)*
(a^4 + I*a^4*Tan[c + d*x]))/(d*e^2*(e*Sec[c + d*x])^(7/2))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3769

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^4}{(e\sec(c+dx))^{11/2}}\,dx = -\frac{4ia(a+ia\tan(c+dx))^3}{11d(e\sec(c+dx))^{11/2}} - \frac{a^2\int \frac{(a+ia\tan(c+dx))^2}{(e\sec(c+dx))^{7/2}}\,dx}{11e^2}$$

$$= -\frac{4ia(a+ia\tan(c+dx))^3}{11d(e\sec(c+dx))^{11/2}} + \frac{4i\left(a^4+ia^4\tan(c+dx)\right)}{77de^2(e\sec(c+dx))^{7/2}} - \frac{\left(3a^4\right)\int \frac{1}{(e\sec(c+dx))^{3/2}}\,dx}{77e^4}$$

$$= -\frac{2a^4\sin(c+dx)}{77de^5\sqrt{e\sec(c+dx)}} - \frac{4ia(a+ia\tan(c+dx))^3}{11d(e\sec(c+dx))^{11/2}} + \frac{4i\left(a^4+ia^4\tan(c+dx)\right)}{77de^2(e\sec(c+dx))^{7/2}} -$$

$$= -\frac{2a^4\sin(c+dx)}{77de^5\sqrt{e\sec(c+dx)}} - \frac{4ia(a+ia\tan(c+dx))^3}{11d(e\sec(c+dx))^{11/2}} + \frac{4i\left(a^4+ia^4\tan(c+dx)\right)}{77de^2(e\sec(c+dx))^{7/2}} -$$

$$= -\frac{2a^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{77de^6} - \frac{2a^4\sin(c+dx)}{77de^5\sqrt{e\sec(c+dx)}} - \frac{4ia}{11}$$

Mathematica [A] time = 1.65, size = 148, normalized size = 0.95

$$-\frac{a^4\sqrt{e\sec(c+dx)}\,(\cos(3c+7dx)+i\sin(3c+7dx))\left(-3\sin(c+dx)-3\sin(3(c+dx))+37i\cos(c+dx)+11i\right.}{154de^6(\cos(dx)+i\sin(dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^4/(e*Sec[c + d*x])^(11/2),x]
```

```
[Out] -1/154*(a^4*Sqrt[e*Sec[c + d*x]]*((37*I)*Cos[c + d*x] + (11*I)*Cos[3*(c + d
*x)] - 3*Sin[c + d*x] + 4*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*(Cos
[3*(c + d*x)] - I*Sin[3*(c + d*x)]) - 3*Sin[3*(c + d*x)])*(Cos[3*c + 7*d*x]
 + I*Sin[3*c + 7*d*x]))/(d*e^6*(Cos[d*x] + I*Sin[d*x])^4)
```

fricas [F] time = 0.59, size = 0, normalized size = 0.00

$$\frac{154\,de^6\text{integral}\left(\frac{i\sqrt{2}\,a^4\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{77\,de^6}, x\right) + \sqrt{2}\left(-7i\,a^4e^{(6i\,dx+6i\,c)} - 20i\,a^4e^{(4i\,dx+4i\,c)} - 17i\,a^4e^{(2i\,dx+2i\,c)} - \right.}{154\,de^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(11/2),x, algorithm="fricas")
```

```
[Out] 1/154*(154*d*e^6*integral(1/77*I*sqrt(2)*a^4*sqrt(e/(e^(2*I*d*x + 2*I*c) +
1))*e^(-1/2*I*d*x - 1/2*I*c)/(d*e^6), x) + sqrt(2)*(-7*I*a^4*e^(6*I*d*x + 6
*I*c) - 20*I*a^4*e^(4*I*d*x + 4*I*c) - 17*I*a^4*e^(2*I*d*x + 2*I*c) - 4*I*a
^4)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))/(d*e^6)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^4}{(e\sec(dx+c))^{\frac{11}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(11/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^4/(e*sec(d*x + c))^(11/2), x)
```

maple [A] time = 1.03, size = 215, normalized size = 1.38

$$-\frac{2a^4\left(56i\left(\cos^6(dx+c)\right)-56\left(\cos^5(dx+c)\right)\sin(dx+c)-44i\left(\cos^4(dx+c)\right)+i\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \mathrm{Elli}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(11/2),x)
```

```
[Out] -2/77*a^4/d*(56*I*cos(d*x+c)^6-56*cos(d*x+c)^5*sin(d*x+c)-44*I*cos(d*x+c)^4
+I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(
-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)+I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x
+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)+16*cos(
d*x+c)^3*sin(d*x+c)+cos(d*x+c)*sin(d*x+c))/cos(d*x+c)^6/(e/cos(d*x+c))^(11/
2)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^4}{(e\sec(dx+c))^{\frac{11}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(11/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^4/(e*sec(d*x + c))^(11/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+a\tan(c+d\,x)\,1\mathrm{i})^4}{\left(\frac{e}{\cos(c+d\,x)}\right)^{11/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^4/(e/cos(c + d*x))^(11/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^4/(e/cos(c + d*x))^(11/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**4/(e*sec(d*x+c))**(11/2),x)
```

```
[Out] Timed out
```

3.221 $\int \frac{(a+ia\tan(c+dx))^4}{(e\sec(c+dx))^{13/2}}\,dx$

Optimal. Leaf size=156

$$\frac{2a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{39de^6\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{2a^4\sin(c+dx)}{117de^5(e\sec(c+dx))^{3/2}}-\frac{4i\left(a^4+ia^4\tan(c+dx)\right)}{117de^2(e\sec(c+dx))^{9/2}}-\frac{4ia(a+ia\tan(c+dx))}{13d(e\sec(c+dx))^{13/2}}$$

```
[Out] 2/117*a^4*sin(d*x+c)/d/e^5/(e*sec(d*x+c))^(3/2)+2/39*a^4*(cos(1/2*d*x+1/2*c
)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/d/e^6/c
os(d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)-4/13*I*a*(a+I*a*tan(d*x+c))^3/d/(e*sec
(d*x+c))^(13/2)-4/117*I*(a^4+I*a^4*tan(d*x+c))/d/e^2/(e*sec(d*x+c))^(9/2)
```

Rubi [A] time = 0.15, antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3496, 3769, 3771, 2639}

$$\frac{2a^4\sin(c+dx)}{117de^5(e\sec(c+dx))^{3/2}}-\frac{4i\left(a^4+ia^4\tan(c+dx)\right)}{117de^2(e\sec(c+dx))^{9/2}}+\frac{2a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{39de^6\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{4ia(a+ia\tan(c+dx))}{13d(e\sec(c+dx))^{13/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^4/(e*Sec[c + d*x])^(13/2),x]
```

```
[Out] (2*a^4*EllipticE[(c + d*x)/2, 2])/(39*d*e^6*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c
 + d*x]]) + (2*a^4*Sin[c + d*x])/(117*d*e^5*(e*Sec[c + d*x])^(3/2)) - (((4*
I)/13)*a*(a + I*a*Tan[c + d*x])^3)/(d*(e*Sec[c + d*x])^(13/2)) - (((4*I)/11
7)*(a^4 + I*a^4*Tan[c + d*x]))/(d*e^2*(e*Sec[c + d*x])^(9/2))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3769

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^4}{(e\sec(c+dx))^{13/2}}\,dx = -\frac{4ia(a+ia\tan(c+dx))^3}{13d(e\sec(c+dx))^{13/2}} + \frac{a^2\int \frac{(a+ia\tan(c+dx))^2}{(e\sec(c+dx))^{9/2}}dx}{13e^2}$$
$$= -\frac{4ia(a+ia\tan(c+dx))^3}{13d(e\sec(c+dx))^{13/2}} - \frac{4i\left(a^4+ia^4\tan(c+dx)\right)}{117de^2(e\sec(c+dx))^{9/2}} + \frac{\left(5a^4\right)\int \frac{1}{(e\sec(c+dx))^{5/2}}dx}{117e^4}$$
$$= \frac{2a^4\sin(c+dx)}{117de^5(e\sec(c+dx))^{3/2}} - \frac{4ia(a+ia\tan(c+dx))^3}{13d(e\sec(c+dx))^{13/2}} - \frac{4i\left(a^4+ia^4\tan(c+dx)\right)}{117de^2(e\sec(c+dx))^{9/2}} + \frac{a^4}{}$$
$$= \frac{2a^4\sin(c+dx)}{117de^5(e\sec(c+dx))^{3/2}} - \frac{4ia(a+ia\tan(c+dx))^3}{13d(e\sec(c+dx))^{13/2}} - \frac{4i\left(a^4+ia^4\tan(c+dx)\right)}{117de^2(e\sec(c+dx))^{9/2}} + \frac{}{39}$$
$$= \frac{2a^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{39de^6\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} + \frac{2a^4\sin(c+dx)}{117de^5(e\sec(c+dx))^{3/2}} - \frac{4ia(a+ia\tan(c+}{13d(e\sec(c+dx)}$$

Mathematica [C] time = 7.22, size = 450, normalized size = 2.88

$$\frac{\sec^3(c+dx)(a+ia\tan(c+dx))^4\left(\left(-\frac{59\sin(c)}{468}-\frac{59}{468}i\cos(c)\right)\cos(3dx)+\left(\frac{37\sin(c)}{468}-\frac{37}{468}i\cos(c)\right)\cos(5dx)+\left(\frac{1}{52}\sin(\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^4/(e*Sec[c + d*x])^(13/2),x]
```

```
[Out] (((-2*I)/117)*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x)))]*Sqrt[
1 + E^((2*I)*(c + d*x))]*(-3*Sqrt[1 + E^((2*I)*(c + d*x))] + E^((2*I)*d*x)*
(-1 + E^((2*I)*c))*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x))])*
Sec[c + d*x]^(5/2)*(a + I*a*Tan[c + d*x])^4)/(d*E^(I*(3*c + d*x))*(-1 + E^(
(2*I)*c))*(e*Sec[c + d*x])^(13/2)*(Cos[d*x] + I*Sin[d*x])^4) + (Sec[c + d*x
]^3*(Cos[3*d*x]*(((-59*I)/468)*Cos[c] - (59*Sin[c])/468) + Cos[5*d*x]*(((-3
7*I)/468)*Cos[c] + (37*Sin[c])/468) + Cos[d*x]*Csc[c]*(24*Cos[c] + (31*I)*S
in[c])*(-1/468*Cos[3*c] + (I/468)*Sin[3*c]) + Cos[7*d*x]*((-1/52*I)*Cos[3*c
] + Sin[3*c]/52) + ((55*Cos[3*c])/468 - ((55*I)/468)*Sin[3*c])*Sin[d*x] + (
(59*Cos[c])/468 - ((59*I)/468)*Sin[c])*Sin[3*d*x] + ((37*Cos[c])/468 + ((37
*I)/468)*Sin[c])*Sin[5*d*x] + (Cos[3*c]/52 + (I/52)*Sin[3*c])*Sin[7*d*x])*(
a + I*a*Tan[c + d*x])^4)/(d*(e*Sec[c + d*x])^(13/2)*(Cos[d*x] + I*Sin[d*x])
^4)
```

fricas [F] time = 0.52, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-9i\,a^4e^{(8i\,dx+8i\,c)}+9i\,a^4e^{(7i\,dx+7i\,c)}-37i\,a^4e^{(6i\,dx+6i\,c)}+37i\,a^4e^{(5i\,dx+5i\,c)}-59i\,a^4e^{(4i\,dx+4i\,c)}+59i\,a^4e^{(3i\,dx+3i\,c)}-5\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(13/2),x, algorithm="fricas")
```

```
[Out] 1/468*(sqrt(2)*(-9*I*a^4*e^(8*I*d*x + 8*I*c) + 9*I*a^4*e^(7*I*d*x + 7*I*c)
- 37*I*a^4*e^(6*I*d*x + 6*I*c) + 37*I*a^4*e^(5*I*d*x + 5*I*c) - 59*I*a^4*e^
(4*I*d*x + 4*I*c) + 59*I*a^4*e^(3*I*d*x + 3*I*c) - 55*I*a^4*e^(2*I*d*x + 2*
I*c) + 31*I*a^4*e^(I*d*x + I*c) - 24*I*a^4)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1
))*e^(1/2*I*d*x + 1/2*I*c) + 468*(d*e^7*e^(I*d*x + I*c) - d*e^7)*integral(1
/39*sqrt(2)*(-I*a^4*e^(2*I*d*x + 2*I*c) - 2*I*a^4*e^(I*d*x + I*c) - I*a^4)*
```

```
sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(d*e^7*e^(3*I*d*x
 + 3*I*c) - 2*d*e^7*e^(2*I*d*x + 2*I*c) + d*e^7*e^(I*d*x + I*c)), x))/(d*e^
7*e^(I*d*x + I*c) - d*e^7)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^4}{(e\sec(dx+c))^{\frac{13}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(13/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^4/(e*sec(d*x + c))^(13/2), x)
```

maple [B] time = 1.14, size = 380, normalized size = 2.44

$$-\frac{2a^4\left(72i\left(\cos^7(dx+c)\right)\sin(dx+c)+72\left(\cos^8(dx+c)\right)-52i\left(\cos^5(dx+c)\right)\sin(dx+c)+3i\cos(dx+c)\sqrt{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(13/2),x)
```

```
[Out] -2/117*a^4/d*(72*I*cos(d*x+c)^7*sin(d*x+c)+72*cos(d*x+c)^8-52*I*cos(d*x+c)^
5*sin(d*x+c)+3*I*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x
+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(d*x+c)-3*I*cos(d*
x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I
*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(d*x+c)-88*cos(d*x+c)^6+3*I*(1/(1+cos(d*x
+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)*EllipticE(I*(-1+co
s(d*x+c))/sin(d*x+c),I)-3*I*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(d
*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+17*cos(d*x
+c)^4+2*cos(d*x+c)^2-3*cos(d*x+c))/cos(d*x+c)^7/sin(d*x+c)/(e/cos(d*x+c))^(
13/2)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^4}{(e\sec(dx+c))^{\frac{13}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(13/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^4/(e*sec(d*x + c))^(13/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+a\tan(c+d\,x)\,1{}i)^4}{\left(\frac{e}{\cos(c+d\,x)}\right)^{13/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^4/(e/cos(c + d*x))^(13/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^4/(e/cos(c + d*x))^(13/2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**4/(e*sec(d*x+c))**(13/2),x)
```

```
[Out] Timed out
```

3.222 $\int \frac{(a+ia\tan(c+dx))^4}{(e\sec(c+dx))^{15/2}}\,dx$

Optimal. Leaf size=187

$$\frac{2a^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{33de^8}+\frac{2a^4\sin(c+dx)}{33de^7\sqrt{e\sec(c+dx)}}+\frac{2a^4\sin(c+dx)}{55de^5(e\sec(c+dx))^{5/2}}-\frac{4i\left(a^4+ia^4\right.}{55de^2(e\sec}$$

```
[Out] 2/55*a^4*sin(d*x+c)/d/e^5/(e*sec(d*x+c))^(5/2)+2/33*a^4*sin(d*x+c)/d/e^7/(e
*sec(d*x+c))^(1/2)+2/33*a^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)
*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(d*x+c))^(1/2
)/d/e^8-4/15*I*a*(a+I*a*tan(d*x+c))^3/d/(e*sec(d*x+c))^(15/2)-4/55*I*(a^4+I
*a^4*tan(d*x+c))/d/e^2/(e*sec(d*x+c))^(11/2)
```

Rubi [A] time = 0.17, antiderivative size = 187, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3496, 3769, 3771, 2641}

$$\frac{2a^4\sin(c+dx)}{33de^7\sqrt{e\sec(c+dx)}}+\frac{2a^4\sin(c+dx)}{55de^5(e\sec(c+dx))^{5/2}}-\frac{4i\left(a^4+ia^4\tan(c+dx)\right)}{55de^2(e\sec(c+dx))^{11/2}}+\frac{2a^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e}}{33de^8}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^4/(e*Sec[c + d*x])^(15/2),x]
```

```
[Out] (2*a^4*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(
33*d*e^8) + (2*a^4*Sin[c + d*x])/(55*d*e^5*(e*Sec[c + d*x])^(5/2)) + (2*a^4
*Sin[c + d*x])/(33*d*e^7*Sqrt[e*Sec[c + d*x]]) - (((4*I)/15)*a*(a + I*a*Tan
[c + d*x])^3)/(d*(e*Sec[c + d*x])^(15/2)) - (((4*I)/55)*(a^4 + I*a^4*Tan[c
+ d*x]))/(d*e^2*(e*Sec[c + d*x])^(11/2))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3769

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^4}{(e\sec(c+dx))^{15/2}}\,dx = -\frac{4ia(a+ia\tan(c+dx))^3}{15d(e\sec(c+dx))^{15/2}} + \frac{a^2\int \frac{(a+ia\tan(c+dx))^2}{(e\sec(c+dx))^{11/2}}\,dx}{5e^2}$$

$$= -\frac{4ia(a+ia\tan(c+dx))^3}{15d(e\sec(c+dx))^{15/2}} - \frac{4i\left(a^4+ia^4\tan(c+dx)\right)}{55de^2(e\sec(c+dx))^{11/2}} + \frac{\left(7a^4\right)\int \frac{1}{(e\sec(c+dx))^{7/2}}\,dx}{55e^4}$$

$$= \frac{2a^4\sin(c+dx)}{55de^5(e\sec(c+dx))^{5/2}} - \frac{4ia(a+ia\tan(c+dx))^3}{15d(e\sec(c+dx))^{15/2}} - \frac{4i\left(a^4+ia^4\tan(c+dx)\right)}{55de^2(e\sec(c+dx))^{11/2}} + \frac{a^4}{\ldots}$$

$$= \frac{2a^4\sin(c+dx)}{55de^5(e\sec(c+dx))^{5/2}} + \frac{2a^4\sin(c+dx)}{33de^7\sqrt{e\sec(c+dx)}} - \frac{4ia(a+ia\tan(c+dx))^3}{15d(e\sec(c+dx))^{15/2}} - \frac{4i\left(a^4\ldots\right.}{55de^2(\ldots}$$

$$= \frac{2a^4\sin(c+dx)}{55de^5(e\sec(c+dx))^{5/2}} + \frac{2a^4\sin(c+dx)}{33de^7\sqrt{e\sec(c+dx)}} - \frac{4ia(a+ia\tan(c+dx))^3}{15d(e\sec(c+dx))^{15/2}} - \frac{4i\left(a^4\ldots\right.}{55de^2(\ldots}$$

$$= \frac{2a^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{33de^8} + \frac{2a^4\sin(c+dx)}{55de^5(e\sec(c+dx))^{5/2}} + \frac{2a\ldots}{33de^7\ldots}$$

Mathematica [A] time = 2.32, size = 155, normalized size = 0.83

$$-\frac{ia^4\sqrt{e\sec(c+dx)}\,(\cos(4(c+2dx))+i\sin(4(c+2dx)))\left(-54i\sin(2(c+dx))-37i\sin(4(c+dx))+112\cos(2(c+\ldots\right.}{660de^8(\cos(dx)+i\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^4/(e*Sec[c + d*x])^(15/2),x]
```

```
[Out] ((-1/660*I)*a^4*Sqrt[e*Sec[c + d*x]]*(64 + 112*Cos[2*(c + d*x)] + 48*Cos[4*
(c + d*x)] - (54*I)*Sin[2*(c + d*x)] - (37*I)*Sin[4*(c + d*x)] + 40*Sqrt[Co
s[c + d*x]]*EllipticF[(c + d*x)/2, 2]*(I*Cos[4*(c + d*x)] + Sin[4*(c + d*x)
]))*(Cos[4*(c + 2*d*x)] + I*Sin[4*(c + 2*d*x)]))/(d*e^8*(Cos[d*x] + I*Sin[d
*x])^4)
```

fricas [F] time = 0.70, size = 0, normalized size = 0.00

$$\frac{1320\,de^8\text{integral}\left(-\frac{i\sqrt{2}\,a^4\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{33\,de^8},x\right)+\sqrt{2}\left(-11i\,a^4e^{(8i\,dx+8i\,c)}-58i\,a^4e^{(6i\,dx+6i\,c)}-128i\,a^4e^{(4i\,dx+4i\,c)}\ldots\right.}{1320\,de^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(15/2),x, algorithm="fricas")
```

```
[Out] 1/1320*(1320*d*e^8*integral(-1/33*I*sqrt(2)*a^4*sqrt(e/(e^(2*I*d*x + 2*I*c)
 + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(d*e^8), x) + sqrt(2)*(-11*I*a^4*e^(8*I*d*x
 + 8*I*c) - 58*I*a^4*e^(6*I*d*x + 6*I*c) - 128*I*a^4*e^(4*I*d*x + 4*I*c) -
166*I*a^4*e^(2*I*d*x + 2*I*c) - 85*I*a^4)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))
*e^(1/2*I*d*x + 1/2*I*c))/(d*e^8)
```

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

$$\int \frac{(i\,a\tan(dx+c)+a)^4}{(e\sec(dx+c))^{\frac{15}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(15/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^4/(e*sec(d*x + c))^(15/2), x)
```

maple [A] time = 1.15, size = 232, normalized size = 1.24

$$-\frac{2a^4\left(88i\left(\cos^8(dx+c)\right)-88\sin(dx+c)\left(\cos^7(dx+c)\right)-60i\left(\cos^6(dx+c)\right)+16\left(\cos^5(dx+c)\right)\sin(dx+c\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(15/2),x)
```

```
[Out] -2/165*a^4/d*(88*I*cos(d*x+c)^8-88*sin(d*x+c)*cos(d*x+c)^7-60*I*cos(d*x+c)^
6+16*cos(d*x+c)^5*sin(d*x+c)-5*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)-3*cos
(d*x+c)^3*sin(d*x+c)-5*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)
))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-5*cos(d*x+c)*sin(d*x+c))
/cos(d*x+c)^8/(e/cos(d*x+c))^(15/2)
```

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

$$\int \frac{(i a \tan(dx+c)+a)^4}{(e \sec(dx+c))^{\frac{15}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^4/(e*sec(d*x+c))^(15/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^4/(e*sec(d*x + c))^(15/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+a\tan(c+d\,x)\,1\mathrm{i})^4}{\left(\frac{e}{\cos(c+d\,x)}\right)^{15/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^4/(e/cos(c + d*x))^(15/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^4/(e/cos(c + d*x))^(15/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**4/(e*sec(d*x+c))**(15/2),x)
```

```
[Out] Timed out
```

3.223 $\int \frac{(e\sec(c+dx))^{11/2}}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=136

$$-\frac{6e^6E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5ad\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{6e^5\sin(c+dx)\sqrt{e\sec(c+dx)}}{5ad}+\frac{2e^3\sin(c+dx)(e\sec(c+dx))^{5/2}}{5ad}-\frac{2ie^2(e\sec(c$$

```
[Out] -2/7*I*e^2*(e*sec(d*x+c))^(7/2)/a/d+2/5*e^3*(e*sec(d*x+c))^(5/2)*sin(d*x+c)
/a/d-6/5*e^6*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(
1/2*d*x+1/2*c),2^(1/2))/a/d/cos(d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)+6/5*e^5*s
in(d*x+c)*(e*sec(d*x+c))^(1/2)/a/d
```

Rubi [A] time = 0.11, antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {3501, 3768, 3771, 2639}

$$-\frac{2ie^2(e\sec(c+dx))^{7/2}}{7ad}+\frac{6e^5\sin(c+dx)\sqrt{e\sec(c+dx)}}{5ad}+\frac{2e^3\sin(c+dx)(e\sec(c+dx))^{5/2}}{5ad}-\frac{6e^6E\left(\frac{1}{2}(c+dx)\right.}{5ad\sqrt{\cos(c+dx)}\sqrt{e\sec}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(11/2)/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (-6*e^6*EllipticE[(c + d*x)/2, 2])/(5*a*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c +
 d*x]]) - (((2*I)/7)*e^2*(e*Sec[c + d*x])^(7/2))/(a*d) + (6*e^5*Sqrt[e*Sec[
c + d*x]]*Sin[c + d*x])/(5*a*d) + (2*e^3*(e*Sec[c + d*x])^(5/2)*Sin[c + d*x
])/(5*a*d)
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3768

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{11/2}}{a+ia\tan(c+dx)}\,dx = -\frac{2ie^2(e\sec(c+dx))^{7/2}}{7ad} + \frac{e^2\int (e\sec(c+dx))^{7/2}\,dx}{a}$$
$$= -\frac{2ie^2(e\sec(c+dx))^{7/2}}{7ad} + \frac{2e^3(e\sec(c+dx))^{5/2}\sin(c+dx)}{5ad} + \frac{(3e^4)\int (e\sec(c+dx))^{3}}{5a}$$
$$= -\frac{2ie^2(e\sec(c+dx))^{7/2}}{7ad} + \frac{6e^5\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5ad} + \frac{2e^3(e\sec(c+dx))^{5/2}\sin}{5ad}$$
$$= -\frac{2ie^2(e\sec(c+dx))^{7/2}}{7ad} + \frac{6e^5\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5ad} + \frac{2e^3(e\sec(c+dx))^{5/2}\sin}{5ad}$$
$$= -\frac{6e^6E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5ad\sqrt{\cos(c+dx)}\,\sqrt{e\sec(c+dx)}} - \frac{2ie^2(e\sec(c+dx))^{7/2}}{7ad} + \frac{6e^5\sqrt{e\sec(c+dx)}\,\sin}{5ad}$$

Mathematica [C] time = 1.59, size = 128, normalized size = 0.94

$$\frac{e^4(\tan(c+dx)-i)(e\sec(c+dx))^{3/2}\left(-7e^{-2i(c+dx)}\left(1+e^{2i(c+dx)}\right)^{5/2}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)+28\cos(2(c+dx))-\right.}{70ad}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(11/2)/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (e^4*(e*Sec[c + d*x])^(3/2)*(76 + 28*Cos[2*(c + d*x)] - (7*(1 + E^((2*I)*(c
 + d*x)))^(5/2)*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x))])/E^(
(2*I)*(c + d*x)) + (7*I)*Sec[c + d*x]*Sin[3*(c + d*x)] - (13*I)*Tan[c + d*x
])*(-I + Tan[c + d*x]))/(70*a*d)
```

fricas [F] time = 0.51, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-42ie^5e^{(7idx+7ic)}-154ie^5e^{(5idx+5ic)}-206ie^5e^{(3idx+3ic)}-14ie^5e^{(idx+ic)}\right)\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}\,e^{\left(\frac{1}{2}idx+\frac{1}{2}ic\right)}+35\left(ade^{(\right.}}{35\left(ade^{(6idx+6ic)}+3\,ade^{(4idx+4ic)}+3\,a\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(11/2)/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/35*(sqrt(2)*(-42*I*e^5*e^(7*I*d*x + 7*I*c) - 154*I*e^5*e^(5*I*d*x + 5*I*c
) - 206*I*e^5*e^(3*I*d*x + 3*I*c) - 14*I*e^5*e^(I*d*x + I*c))*sqrt(e/(e^(2*
I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 35*(a*d*e^(6*I*d*x + 6*I*c)
+ 3*a*d*e^(4*I*d*x + 4*I*c) + 3*a*d*e^(2*I*d*x + 2*I*c) + a*d)*integral(3/5
*I*sqrt(2)*e^5*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(a
*d), x))/(a*d*e^(6*I*d*x + 6*I*c) + 3*a*d*e^(4*I*d*x + 4*I*c) + 3*a*d*e^(2*
I*d*x + 2*I*c) + a*d)
```

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

$$\int \frac{(e\sec(dx+c))^{\frac{11}{2}}}{i\,a\tan(dx+c)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(11/2)/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

[Out] integrate((e*sec(d*x + c))^(11/2)/(I*a*tan(d*x + c) + a), x)

maple [B] time = 1.16, size = 375, normalized size = 2.76

$$\frac{2\left(1+\cos\left(dx+c\right)\right)^{2}\left(-1+\cos\left(dx+c\right)\right)^{2}\left(21i\left(\cos^{4}\left(dx+c\right)\right)\sin\left(dx+c\right)\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \mathrm{EllipticE}\left(\frac{i(-}{}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(11/2)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] 2/35/a/d*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(21*I*cos(d*x+c)^4*sin(d*x+c)*(
1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+c
os(d*x+c))/sin(d*x+c),I)-21*I*cos(d*x+c)^4*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1
/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c
),I)+21*I*cos(d*x+c)^3*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)-21*I*cos(d*x+c)
^3*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*El
lipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-21*cos(d*x+c)^4+14*cos(d*x+c)^3-5*I
*sin(d*x+c)+7*cos(d*x+c))*(e/cos(d*x+c))^(11/2)*cos(d*x+c)^2/sin(d*x+c)^5
```

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(11/2)/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{11/2}}{a+a\tan\left(c+d\,x\right)\,1{}\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(11/2)/(a + a*tan(c + d*x)*1i),x)
```

```
[Out] int((e/cos(c + d*x))^(11/2)/(a + a*tan(c + d*x)*1i), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(11/2)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] Timed out
```

3.224 $\int \frac{(e\sec(c+dx))^{9/2}}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=105

$$\frac{2e^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3ad}+\frac{2e^3\sin(c+dx)(e\sec(c+dx))^{3/2}}{3ad}-\frac{2ie^2(e\sec(c+dx))^{5/2}}{5ad}$$

```
[Out] -2/5*I*e^2*(e*sec(d*x+c))^(5/2)/a/d+2/3*e^3*(e*sec(d*x+c))^(3/2)*sin(d*x+c)
/a/d+2/3*e^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(
1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(d*x+c))^(1/2)/a/d
```

Rubi [A] time = 0.09, antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3501, 3768, 3771, 2641}

$$-\frac{2ie^2(e\sec(c+dx))^{5/2}}{5ad}+\frac{2e^3\sin(c+dx)(e\sec(c+dx))^{3/2}}{3ad}+\frac{2e^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3ad}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(9/2)/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (2*e^4*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(
3*a*d) - (((2*I)/5)*e^2*(e*Sec[c + d*x])^(5/2))/(a*d) + (2*e^3*(e*Sec[c + d
*x])^(3/2)*Sin[c + d*x])/(3*a*d)
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3768

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

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{9/2}}{a+ia\tan(c+dx)}\,dx = -\frac{2ie^2(e\sec(c+dx))^{5/2}}{5ad} + \frac{e^2\int (e\sec(c+dx))^{5/2}\,dx}{a}$$
$$= -\frac{2ie^2(e\sec(c+dx))^{5/2}}{5ad} + \frac{2e^3(e\sec(c+dx))^{3/2}\sin(c+dx)}{3ad} + \frac{e^4\int \sqrt{e\sec(c+dx)}\,dx}{3a}$$
$$= -\frac{2ie^2(e\sec(c+dx))^{5/2}}{5ad} + \frac{2e^3(e\sec(c+dx))^{3/2}\sin(c+dx)}{3ad} + \frac{\left(e^4\sqrt{\cos(c+dx)}\sqrt{e\sec(c\right.}{3a}$$
$$= \frac{2e^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3ad} - \frac{2ie^2(e\sec(c+dx))^{5/2}}{5ad} + \frac{2e^3(e\sec(}{}$$

Mathematica [A] time = 0.69, size = 62, normalized size = 0.59

$$\frac{e^2(e\sec(c+dx))^{5/2}\left(5\sin(2(c+dx))+10\cos^{\frac{5}{2}}(c+dx)F\left(\frac{1}{2}(c+dx)\middle|2\right)-6i\right)}{15ad}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(9/2)/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (e^2*(e*Sec[c + d*x])^(5/2)*(-6*I + 10*Cos[c + d*x]^(5/2)*EllipticF[(c + d*
x)/2, 2] + 5*Sin[2*(c + d*x)]))/(15*a*d)
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-10i\,e^4e^{(4i\,dx+4i\,c)}-24i\,e^4e^{(2i\,dx+2i\,c)}+10i\,e^4\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+15\left(ade^{(4i\,dx+4i\,c)}+2\,ade^{(2i\,dx+2i\,c)}+ad\right)}{15\left(ade^{(4i\,dx+4i\,c)}+2\,ade^{(2i\,dx+2i\,c)}+ad\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(9/2)/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/15*(sqrt(2)*(-10*I*e^4*e^(4*I*d*x + 4*I*c) - 24*I*e^4*e^(2*I*d*x + 2*I*c)
 + 10*I*e^4)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 15
*(a*d*e^(4*I*d*x + 4*I*c) + 2*a*d*e^(2*I*d*x + 2*I*c) + a*d)*integral(-1/3*
I*sqrt(2)*e^4*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(a
*d), x))/(a*d*e^(4*I*d*x + 4*I*c) + 2*a*d*e^(2*I*d*x + 2*I*c) + a*d)
```

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

$$\int \frac{(e\sec(dx+c))^{\frac{9}{2}}}{i\,a\tan(dx+c)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(9/2)/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(9/2)/(I*a*tan(d*x + c) + a), x)
```

maple [A] time = 1.09, size = 202, normalized size = 1.92

$$\frac{2(1+\cos(dx+c))^2(-1+\cos(dx+c))^2\left(5i\,\mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)\left(\cos^3(dx+c)\right)\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((e*sec(d*x+c))^(9/2)/(a+I*a*tan(d*x+c)),x)

[Out] 2/15/a/d*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(5*I*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)^3*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+5*I*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)^2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+5*cos(d*x+c)*sin(d*x+c)-3*I)*(e/cos(d*x+c))^(9/2)*cos(d*x+c)^2/sin(d*x+c)^4

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

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((e*sec(d*x+c))^(9/2)/(a+I*a*tan(d*x+c)),x, algorithm="maxima")

[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is undefined.

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{9/2}}{a+a\tan\left(c+d\,x\right)\,1{}\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((e/cos(c + d*x))^(9/2)/(a + a*tan(c + d*x)*1i),x)

[Out] int((e/cos(c + d*x))^(9/2)/(a + a*tan(c + d*x)*1i), x)

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((e*sec(d*x+c))**(9/2)/(a+I*a*tan(d*x+c)),x)

[Out] Timed out

3.225 $\int \frac{(e\sec(c+dx))^{7/2}}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=101

$$-\frac{2e^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{2e^3\sin(c+dx)\sqrt{e\sec(c+dx)}}{ad}-\frac{2ie^2(e\sec(c+dx))^{3/2}}{3ad}$$

```
[Out] -2/3*I*e^2*(e*sec(d*x+c))^(3/2)/a/d-2*e^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(
1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/a/d/cos(d*x+c)^(1/2)/(
e*sec(d*x+c))^(1/2)+2*e^3*sin(d*x+c)*(e*sec(d*x+c))^(1/2)/a/d
```

Rubi [A] time = 0.09, antiderivative size = 101, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {3501, 3768, 3771, 2639}

$$-\frac{2ie^2(e\sec(c+dx))^{3/2}}{3ad}+\frac{2e^3\sin(c+dx)\sqrt{e\sec(c+dx)}}{ad}-\frac{2e^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

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

```
[Out] (-2*e^4*EllipticE[(c + d*x)/2, 2])/(a*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c + d
*x]]) - (((2*I)/3)*e^2*(e*Sec[c + d*x])^(3/2))/(a*d) + (2*e^3*Sqrt[e*Sec[c
+ d*x]]*Sin[c + d*x])/(a*d)
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{7/2}}{a+ia\tan(c+dx)}\,dx = -\frac{2ie^2(e\sec(c+dx))^{3/2}}{3ad} + \frac{e^2\int (e\sec(c+dx))^{3/2}\,dx}{a}$$

$$= -\frac{2ie^2(e\sec(c+dx))^{3/2}}{3ad} + \frac{2e^3\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{ad} - \frac{e^4\int \frac{1}{\sqrt{e\sec(c+dx)}}\,dx}{a}$$

$$= -\frac{2ie^2(e\sec(c+dx))^{3/2}}{3ad} + \frac{2e^3\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{ad} - \frac{e^4\int \sqrt{\cos(c+dx)}\,d}{a\sqrt{\cos(c+dx)}\,\sqrt{e\sec(c}}$$

$$= -\frac{2e^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad\sqrt{\cos(c+dx)}\,\sqrt{e\sec(c+dx)}} - \frac{2ie^2(e\sec(c+dx))^{3/2}}{3ad} + \frac{2e^3\sqrt{e\sec(c+dx)}\,\sin(}{ad}$$

Mathematica [C] time = 0.84, size = 102, normalized size = 1.01

$$\frac{2ie^3(\cos(c)+i\sin(c))(\cos(dx)+i\sin(dx))\sqrt{e\sec(c+dx)}\left(\sqrt{1+e^{2i(c+dx)}}\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)+i\tan(c+dx\right.}{3ad}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(7/2)/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (((2*I)/3)*e^3*Sqrt[e*Sec[c + d*x]]*(Cos[c] + I*Sin[c])*(Cos[d*x] + I*Sin[d
*x])*(-4 + Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/2, 3/4, 7/4, -
E^((2*I)*(c + d*x))] + I*Tan[c + d*x]))/(a*d)
```

fricas [F] time = 0.67, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-6i\,e^3e^{(3i\,dx+3i\,c)}-10i\,e^3e^{(i\,dx+i\,c)}\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+3\left(ade^{(2i\,dx+2i\,c)}+ad\right)\text{integral}\left(\frac{i\sqrt{2}e^3\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+}}}{ad}\right.}{3\left(ade^{(2i\,dx+2i\,c)}+ad\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/3*(sqrt(2)*(-6*I*e^3*e^(3*I*d*x + 3*I*c) - 10*I*e^3*e^(I*d*x + I*c))*sqrt
(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 3*(a*d*e^(2*I*d*x +
 2*I*c) + a*d)*integral(I*sqrt(2)*e^3*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(
1/2*I*d*x + 1/2*I*c)/(a*d), x))/(a*d*e^(2*I*d*x + 2*I*c) + a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{7}{2}}}{i\,a\tan(dx+c)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(7/2)/(I*a*tan(d*x + c) + a), x)
```

maple [B] time = 1.09, size = 361, normalized size = 3.57

$$2\,(1+\cos(dx+c))^2\,(-1+\cos(dx+c))^2\left(3i\sin(dx+c)\left(\cos^2(dx+c)\right)\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\;\text{EllipticE}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] 2/3/a/d*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(3*I*sin(d*x+c)*cos(d*x+c)^2*(1/
(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos
(d*x+c))/sin(d*x+c),I)-3*I*sin(d*x+c)*cos(d*x+c)^2*(1/(1+cos(d*x+c)))^(1/2)
*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I
)+3*I*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(d*x+c)-3*I*cos(d*x+c)*(1/(1+
cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*
x+c))/sin(d*x+c),I)*sin(d*x+c)-3*cos(d*x+c)^2-I*sin(d*x+c)+3*cos(d*x+c))*(e
/cos(d*x+c))^(7/2)*cos(d*x+c)^2/sin(d*x+c)^5
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{7/2}}{a+a\tan\left(c+d\,x\right)\,1\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(7/2)/(a + a*tan(c + d*x)*1i),x)
```

```
[Out] int((e/cos(c + d*x))^(7/2)/(a + a*tan(c + d*x)*1i), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(7/2)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] Timed out
```

3.226 $\int \frac{(e\sec(c+dx))^{5/2}}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=70

$$\frac{2e^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{ad}-\frac{2ie^2\sqrt{e\sec(c+dx)}}{ad}$$

```
[Out] -2*I*e^2*(e*sec(d*x+c))^(1/2)/a/d+2*e^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/
2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(
d*x+c))^(1/2)/a/d
```

Rubi [A] time = 0.07, antiderivative size = 70, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.107$, Rules used = {3501, 3771, 2641}

$$\frac{2e^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{ad}-\frac{2ie^2\sqrt{e\sec(c+dx)}}{ad}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(5/2)/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((-2*I)*e^2*Sqrt[e*Sec[c + d*x]])/(a*d) + (2*e^2*Sqrt[Cos[c + d*x]]*Ellipti
cF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(a*d)
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\begin{aligned}
\int \frac{(e\sec(c+dx))^{5/2}}{a+ia\tan(c+dx)}\,dx &= -\frac{2ie^2\sqrt{e\sec(c+dx)}}{ad}+\frac{e^2\int \sqrt{e\sec(c+dx)}\,dx}{a}\\
&= -\frac{2ie^2\sqrt{e\sec(c+dx)}}{ad}+\frac{\left(e^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{a}\\
&= -\frac{2ie^2\sqrt{e\sec(c+dx)}}{ad}+\frac{2e^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{ad}
\end{aligned}$$

Mathematica [A] time = 0.38, size = 49, normalized size = 0.70

$$\frac{2e^2\sqrt{e\sec(c+dx)}\left(\sqrt{\cos(c+dx)}F\left(\frac{1}{2}(c+dx)\middle|2\right)-i\right)}{ad}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(5/2)/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (2*e^2*(-I + Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])*Sqrt[e*Sec[c + d
*x]])/(a*d)
```

fricas [F] time = 0.66, size = 0, normalized size = 0.00

$$\frac{-2i\sqrt{2}e^2\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}e^{\left(\frac{1}{2}idx+\frac{1}{2}ic\right)}+ad\mathrm{integral}\left(-\frac{i\sqrt{2}e^2\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}e^{\left(-\frac{1}{2}idx-\frac{1}{2}ic\right)}}{ad},x\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] (-2*I*sqrt(2)*e^2*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)
 + a*d*integral(-I*sqrt(2)*e^2*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*
d*x - 1/2*I*c)/(a*d), x))/(a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{5}{2}}}{ia\tan(dx+c)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(5/2)/(I*a*tan(d*x + c) + a), x)
```

maple [A] time = 1.08, size = 174, normalized size = 2.49

$$\frac{2i(1+\cos(dx+c))^2(-1+\cos(dx+c))^2\left(\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\cos(dx+c)\,\mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)+\sqrt{}\right.}{ad\sin(dx+c)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] 2*I/a/d*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*((1/(1+cos(d*x+c)))^(1/2)*(cos(d
*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+
c),I)+(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(
I*(-1+cos(d*x+c))/sin(d*x+c),I)-1)*(e/cos(d*x+c))^(5/2)*cos(d*x+c)^2/sin(d*
x+c)^4
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{5/2}}{a+a\tan\left(c+d\,x\right)\,1\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(5/2)/(a + a*tan(c + d*x)*1i),x)
```

```
[Out] int((e/cos(c + d*x))^(5/2)/(a + a*tan(c + d*x)*1i), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\int \frac{(e\sec(c+dx))^{\frac{5}{2}}}{\tan(c+dx)-i}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(5/2)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] -I*Integral((e*sec(c + d*x))**(5/2)/(tan(c + d*x) - I), x)/a
```

3.227 $\int \frac{(e\sec(c+dx))^{3/2}}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=70

$$\frac{2e^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{2ie^2}{ad\sqrt{e\sec(c+dx)}}$$

```
[Out] 2*I*e^2/a/d/(e*sec(d*x+c))^(1/2)+2*e^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2
*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/a/d/cos(d*x+c)^(1/2)/(e*s
ec(d*x+c))^(1/2)
```

Rubi [A] time = 0.07, antiderivative size = 70, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.107, Rules used = {3501, 3771, 2639}

$$\frac{2e^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{2ie^2}{ad\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(3/2)/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((2*I)*e^2)/(a*d*Sqrt[e*Sec[c + d*x]]) + (2*e^2*EllipticE[(c + d*x)/2, 2])/
(a*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c + d*x]])
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\begin{aligned}\int \frac{(e\sec(c+dx))^{3/2}}{a+ia\tan(c+dx)}\,dx &= \frac{2ie^2}{ad\sqrt{e\sec(c+dx)}}+\frac{e^2\int \frac{1}{\sqrt{e\sec(c+dx)}}\,dx}{a}\\ &= \frac{2ie^2}{ad\sqrt{e\sec(c+dx)}}+\frac{e^2\int \sqrt{\cos(c+dx)}\,dx}{a\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}\\ &= \frac{2ie^2}{ad\sqrt{e\sec(c+dx)}}+\frac{2e^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{ad\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}\end{aligned}$$

Mathematica [C] time = 0.42, size = 74, normalized size = 1.06

$$\frac{2iee^{-i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\ {}_2F_1\left(-\frac{1}{4},\frac{1}{2};\frac{3}{4};-e^{2i(c+dx)}\right)\sqrt{e\sec(c+dx)}}{ad}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(3/2)/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((2*I)*e*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4, -E
^((2*I)*(c + d*x))]*Sqrt[e*Sec[c + d*x]])/(a*d*E^(I*(c + d*x)))
```

fricas [F] time = 0.59, size = 0, normalized size = 0.00

$$\frac{\left(ade^{(i\,dx+i\,c)}\text{integral}\left(-\frac{i\sqrt{2}e\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}}{ad},x\right)+\sqrt{2}\left(2i\,ee^{(2i\,dx+2i\,c)}+2i\,e\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}\right)e^{(-i\,dx-}}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] (a*d*e^(I*d*x + I*c)*integral(-I*sqrt(2)*e*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1)
)*e^(1/2*I*d*x + 1/2*I*c)/(a*d), x) + sqrt(2)*(2*I*e*e^(2*I*d*x + 2*I*c) +
2*I*e)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))*e^(-I*d*x
 - I*c)/(a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{3}{2}}}{i\,a\tan(dx+c)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(3/2)/(I*a*tan(d*x + c) + a), x)
```

maple [B] time = 1.24, size = 347, normalized size = 4.96

$$-\frac{2\left(-1+\cos(dx+c)\right)^{2}\left(-i\cos(dx+c)\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \text{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)\sin(dx+c)+i\,c}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] -2/a/d*(-1+cos(d*x+c))^2*(-I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*
x+c)))^(1/2)*cos(d*x+c)*sin(d*x+c)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I
)+I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)*s
in(d*x+c)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)-I*(1/(1+cos(d*x+c)))^(1
/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)*EllipticF(I*(-1+cos(d*x+c)
)/sin(d*x+c),I)+I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2
)*sin(d*x+c)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)-I*cos(d*x+c)*sin(d*x
+c)+cos(d*x+c)^2-cos(d*x+c))*(1+cos(d*x+c))^2*(e/cos(d*x+c))^(3/2)*cos(d*x+
c)/sin(d*x+c)^5
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{3/2}}{a+a\tan\left(c+d\,x\right)\,1\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(3/2)/(a + a*tan(c + d*x)*1i),x)
```

```
[Out] int((e/cos(c + d*x))^(3/2)/(a + a*tan(c + d*x)*1i), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\int \frac{(e\sec\left(c+dx\right))^{\frac{3}{2}}}{\tan\left(c+dx\right)-i}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(3/2)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] -I*Integral((e*sec(c + d*x))**(3/2)/(tan(c + d*x) - I), x)/a
```

3.228 $\int \frac{\sqrt{e \sec(c+dx)}}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=80

$$\frac{2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3ad}+\frac{2i\sqrt{e\sec(c+dx)}}{3d(a+ia\tan(c+dx))}$$

```
[Out] 2/3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1
/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(d*x+c))^(1/2)/a/d+2/3*I*(e*sec(d*x+c
))^(1/2)/d/(a+I*a*tan(d*x+c))
```

Rubi [A] time = 0.07, antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.107, Rules used = {3502, 3771, 2641}

$$\frac{2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3ad}+\frac{2i\sqrt{e\sec(c+dx)}}{3d(a+ia\tan(c+dx))}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Sec[c + d*x]]/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(3*a*
d) + (((2*I)/3)*Sqrt[e*Sec[c + d*x]])/(d*(a + I*a*Tan[c + d*x]))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{e\sec(c+dx)}}{a+ia\tan(c+dx)}\,dx &= \frac{2i\sqrt{e\sec(c+dx)}}{3d(a+ia\tan(c+dx))}+\frac{\int \sqrt{e\sec(c+dx)}\,dx}{3a}\\
&= \frac{2i\sqrt{e\sec(c+dx)}}{3d(a+ia\tan(c+dx))}+\frac{\left(\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3a}\\
&= \frac{2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3ad}+\frac{2i\sqrt{e\sec(c+dx)}}{3d(a+ia\tan(c+dx))}
\end{aligned}$$

Mathematica [A] time = 0.34, size = 83, normalized size = 1.04

$$\frac{2(e\sec(c+dx))^{3/2}\left(\cos(c+dx)+\sqrt{\cos(c+dx)}F\left(\frac{1}{2}(c+dx)\middle|2\right)(\sin(c+dx)-i\cos(c+dx))\right)}{3ade(\tan(c+dx)-i)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Sec[c + d*x]]/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (2*(e*Sec[c + d*x])^(3/2)*(Cos[c + d*x] + Sqrt[Cos[c + d*x]]*EllipticF[(c +
 d*x)/2, 2]*((-I)*Cos[c + d*x] + Sin[c + d*x])))/(3*a*d*e*(-I + Tan[c + d*x
]))
```

fricas [F] time = 0.60, size = 0, normalized size = 0.00

$$\frac{\left(3\,ade^{(2i\,dx+2i\,c)}\text{integral}\left(-\frac{i\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{3\,ad},x\right)+\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(i\,e^{(2i\,dx+2i\,c)}+i\right)e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}\right)e^{(-2i\,dx-2i\,c)}}{3\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/3*(3*a*d*e^(2*I*d*x + 2*I*c)*integral(-1/3*I*sqrt(2)*sqrt(e/(e^(2*I*d*x +
 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(a*d), x) + sqrt(2)*sqrt(e/(e^(2*I*d
*x + 2*I*c) + 1))*(I*e^(2*I*d*x + 2*I*c) + I)*e^(1/2*I*d*x + 1/2*I*c))*e^(-
2*I*d*x - 2*I*c)/(a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\sec\left(dx+c\right)}}{i\,a\tan\left(dx+c\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*sec(d*x + c))/(I*a*tan(d*x + c) + a), x)
```

maple [B] time = 1.10, size = 192, normalized size = 2.40

$$\frac{2\sqrt{\frac{e}{\cos(dx+c)}}\left(-1+\cos\left(dx+c\right)\right)^{2}\left(1+\cos\left(dx+c\right)\right)^{2}\left(i\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\text{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)\cos\left(\right.\right.}{3ad\sin\left(\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] 2/3/a/d*(e/cos(d*x+c))^(1/2)*(-1+cos(d*x+c))^2*(1+cos(d*x+c))^2*(I*(1/(1+co
s(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+
c))/sin(d*x+c),I)*cos(d*x+c)+I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(
d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)+I*cos(d*x+c)^2+cos
(d*x+c)*sin(d*x+c))/sin(d*x+c)^4
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{\frac{e}{\cos(c+d\,x)}}}{a+a\tan\left(c+d\,x\right)\,1\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(1/2)/(a + a*tan(c + d*x)*1i),x)
```

```
[Out] int((e/cos(c + d*x))^(1/2)/(a + a*tan(c + d*x)*1i), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\int\frac{\sqrt{e}\sec{(c+dx)}}{\tan{(c+dx)}-i}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(1/2)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] -I*Integral(sqrt(e*sec(c + d*x))/(tan(c + d*x) - I), x)/a
```

3.229 $\int \frac{1}{\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))}\,dx$

Optimal. Leaf size=80

$$\frac{6E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5ad\sqrt{\cos(c+dx)}\,\sqrt{e\sec(c+dx)}}+\frac{2i}{5d(a+ia\tan(c+dx))\sqrt{e\sec(c+dx)}}$$

```
[Out] 6/5*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1
/2*c),2^(1/2))/a/d/cos(d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)+2/5*I/d/(e*sec(d*x
+c))^(1/2)/(a+I*a*tan(d*x+c))
```

Rubi [A] time = 0.07, antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.107$, Rules used = {3502, 3771, 2639}

$$\frac{6E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5ad\sqrt{\cos(c+dx)}\,\sqrt{e\sec(c+dx)}}+\frac{2i}{5d(a+ia\tan(c+dx))\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])),x]
```

```
[Out] (6*EllipticE[(c + d*x)/2, 2])/(5*a*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c + d*x]
]) + ((2*I)/5)/(d*Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x]))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))}\,dx &= \frac{2i}{5d\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))}+\frac{3\int \frac{1}{\sqrt{e\sec(c+dx)}}\,dx}{5a}\\
&= \frac{2i}{5d\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))}+\frac{3\int \sqrt{\cos(c+dx)}\,dx}{5a\sqrt{\cos(c+dx)}\,\sqrt{e\sec(c+d}}\\
&= \frac{6E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5ad\sqrt{\cos(c+dx)}\,\sqrt{e\sec(c+dx)}}+\frac{2i}{5d\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+}
\end{aligned}$$

Mathematica [C] time = 0.88, size = 109, normalized size = 1.36

$$\frac{(\tan(c+dx)+i)\left(-2e^{2i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)+3i\sin(2(c+dx))+4\cos(2(c+dx))+4\right)}{5ad\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])),x]
```

```
[Out] ((4 + 4*Cos[2*(c + d*x)] - 2*E^((2*I)*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x
))]*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x))] + (3*I)*Sin[2*(c
 + d*x)])*(I + Tan[c + d*x]))/(5*a*d*Sqrt[e*Sec[c + d*x]])
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}\left(-5ie^{(5idx+5ic)}-7ie^{(4idx+4ic)}-4ie^{(3idx+3ic)}-8ie^{(2idx+2ic)}+ie^{(idx+ic)}-i\right)e^{\left(\frac{1}{2}idx+\frac{1}{2}ic\right)}+10\left(ad\right.}{10\left(adee^{(4idx+4ic)}-adee^{(3id}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/10*(sqrt(2)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(-5*I*e^(5*I*d*x + 5*I*c) -
 7*I*e^(4*I*d*x + 4*I*c) - 4*I*e^(3*I*d*x + 3*I*c) - 8*I*e^(2*I*d*x + 2*I*c
) + I*e^(I*d*x + I*c) - I)*e^(1/2*I*d*x + 1/2*I*c) + 10*(a*d*e*e^(4*I*d*x +
 4*I*c) - a*d*e*e^(3*I*d*x + 3*I*c))*integral(1/5*sqrt(2)*sqrt(e/(e^(2*I*d*
x + 2*I*c) + 1))*(-3*I*e^(2*I*d*x + 2*I*c) - 6*I*e^(I*d*x + I*c) - 3*I)*e^(
1/2*I*d*x + 1/2*I*c)/(a*d*e*e^(3*I*d*x + 3*I*c) - 2*a*d*e*e^(2*I*d*x + 2*I*
c) + a*d*e*e^(I*d*x + I*c)), x))/(a*d*e*e^(4*I*d*x + 4*I*c) - a*d*e*e^(3*I*
d*x + 3*I*c))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{e\sec\left(dx+c\right)}\left(i\,a\tan\left(dx+c\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(e*sec(d*x + c))*(I*a*tan(d*x + c) + a)), x)
```

maple [B] time = 1.63, size = 358, normalized size = 4.48

$$2\left(3i\cos\left(dx+c\right)\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)\sin\left(dx+c\right)-3i\cos\left(dx+c\right)\sqrt{\frac{1}{1+\cos(dx}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] 2/5/a/d*(3*I*sin(d*x+c)*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+
cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-3*I*sin(d*x+c)
*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Elli
pticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)+3*I*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/
2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c)
,I)-3*I*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/
```

```
2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)+I*cos(d*x+c)^3*sin(d*x+c)-cos(
d*x+c)^4-2*cos(d*x+c)^2+3*cos(d*x+c))*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(e
/cos(d*x+c))^(1/2)/sin(d*x+c)^5/e
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\sqrt{\frac{e}{\cos(c+d\,x)}}\,\left(a+a\tan\left(c+d\,x\right)\,1\mathrm{i}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)),x)
```

```
[Out] int(1/((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\int\frac{1}{\sqrt{e\sec\left(c+dx\right)}\tan\left(c+dx\right)-i\sqrt{e\sec\left(c+dx\right)}}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))**(1/2)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] -I*Integral(1/(sqrt(e*sec(c + d*x))*tan(c + d*x) - I*sqrt(e*sec(c + d*x))),
 x)/a
```

3.230 $\int \frac{1}{(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))}\,dx$

Optimal. Leaf size=114

$$\frac{10\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{21ade^2}+\frac{10\sin(c+dx)}{21ade\sqrt{e\sec(c+dx)}}+\frac{2i}{7d(a+ia\tan(c+dx))(e\sec(c+dx))^{3}}$$

```
[Out] 10/21*sin(d*x+c)/a/d/e/(e*sec(d*x+c))^(1/2)+10/21*(cos(1/2*d*x+1/2*c)^2)^(1
/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/
2)*(e*sec(d*x+c))^(1/2)/a/d/e^2+2/7*I/d/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x
+c))
```

Rubi [A] time = 0.09, antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3502, 3769, 3771, 2641}

$$\frac{10\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{21ade^2}+\frac{10\sin(c+dx)}{21ade\sqrt{e\sec(c+dx)}}+\frac{2i}{7d(a+ia\tan(c+dx))(e\sec(c+dx))^{3}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])),x]
```

```
[Out] (10*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(21*
a*d*e^2) + (10*Sin[c + d*x])/(21*a*d*e*Sqrt[e*Sec[c + d*x]]) + ((2*I)/7)/(d
*(e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x]))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{1}{(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))}dx = \frac{2i}{7d(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))} + \frac{5\int \frac{1}{(e\sec(c+dx))^{3/2}}dx}{7a}$$
$$= \frac{10\sin(c+dx)}{21ade\sqrt{e\sec(c+dx)}} + \frac{2i}{7d(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))} + \frac{5}{}$$
$$= \frac{10\sin(c+dx)}{21ade\sqrt{e\sec(c+dx)}} + \frac{2i}{7d(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))} + \frac{(}{}$$
$$= \frac{10\sqrt{\cos(c+dx)}F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{21ade^2} + \frac{10\sin(c+dx}{21ade\sqrt{e\sec(c+}}$$

Mathematica [A] time = 0.60, size = 125, normalized size = 1.10

$$-\frac{\sec^3(c+dx)\left(5i\sin(c+dx)+5i\sin(3(c+dx))-14\cos(c+dx)+2\cos(3(c+dx))+20i\sqrt{\cos(c+dx)}F\left(\frac{1}{2}(c+\right.\right.}{42ad(\tan(c+dx)-i)(e\sec(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])),x]
```

```
[Out] -1/42*(Sec[c + d*x]^3*(-14*Cos[c + d*x] + 2*Cos[3*(c + d*x)] + (20*I)*Sqrt[
Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*(Cos[c + d*x] + I*Sin[c + d*x]) + (
5*I)*Sin[c + d*x] + (5*I)*Sin[3*(c + d*x)]))/(a*d*(e*Sec[c + d*x])^(3/2)*(-
I + Tan[c + d*x]))
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\frac{\left(84\,ade^2e^{(4i\,dx+4i\,c)}\text{integral}\left(-\frac{5i\,\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{21\,ade^2},x\right)+\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(-7i\,e^{(6i\,dx+6i\,c)}+9i\,e^{(4i\,dx+4i\,c)}+19\right.\right.}{84\,ade^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/84*(84*a*d*e^2*e^(4*I*d*x + 4*I*c)*integral(-5/21*I*sqrt(2)*sqrt(e/(e^(2*
I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(a*d*e^2), x) + sqrt(2)*sqrt(
e/(e^(2*I*d*x + 2*I*c) + 1))*(-7*I*e^(6*I*d*x + 6*I*c) + 9*I*e^(4*I*d*x + 4
*I*c) + 19*I*e^(2*I*d*x + 2*I*c) + 3*I)*e^(1/2*I*d*x + 1/2*I*c))*e^(-4*I*d*
x - 4*I*c)/(a*d*e^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\sec(dx+c))^{\frac{3}{2}}(i\,a\tan(dx+c)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(1/((e*sec(d*x + c))^(3/2)*(I*a*tan(d*x + c) + a)), x)
```

maple [A] time = 1.28, size = 218, normalized size = 1.91

$$\frac{2\cos(dx+c)\left(\frac{e}{\cos(dx+c)}\right)^{\frac{3}{2}}(-1+\cos(dx+c))^2(1+\cos(dx+c))^2\left(3i\left(\cos^4(dx+c)\right)+5i\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+}}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] 2/21/a/d*cos(d*x+c)*(e/cos(d*x+c))^(3/2)*(-1+cos(d*x+c))^2*(1+cos(d*x+c))^2
*(3*I*cos(d*x+c)^4+5*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)+5*I*(1/(1+cos(d
*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))
/sin(d*x+c),I)+3*cos(d*x+c)^3*sin(d*x+c)+5*cos(d*x+c)*sin(d*x+c))/e^3/sin(d
*x+c)^4
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(\frac{e}{\cos(c+d\,x)}\right)}^{3/2}\,\left(a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)),x)
```

```
[Out] int(1/((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\int \frac{1}{\left(e\sec\left(c+dx\right)\right)^{\frac{3}{2}}\tan\left(c+dx\right)-i\left(e\sec\left(c+dx\right)\right)^{\frac{3}{2}}}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))**(3/2)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] -I*Integral(1/((e*sec(c + d*x))**(3/2)*tan(c + d*x) - I*(e*sec(c + d*x))**(
3/2)), x)/a
```

3.231 $\int \frac{1}{(e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))}\,dx$

Optimal. Leaf size=114

$$\frac{14E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15ade^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{14\sin(c+dx)}{45ade(e\sec(c+dx))^{3/2}}+\frac{2i}{9d(a+ia\tan(c+dx))(e\sec(c+dx))^{5/2}}$$

```
[Out] 14/45*sin(d*x+c)/a/d/e/(e*sec(d*x+c))^(3/2)+14/15*(cos(1/2*d*x+1/2*c)^2)^(1
/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/a/d/e^2/cos(d*
x+c)^(1/2)/(e*sec(d*x+c))^(1/2)+2/9*I/d/(e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x
+c))
```

Rubi [A] time = 0.09, antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3502, 3769, 3771, 2639}

$$\frac{14E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15ade^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{14\sin(c+dx)}{45ade(e\sec(c+dx))^{3/2}}+\frac{2i}{9d(a+ia\tan(c+dx))(e\sec(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Sec[c + d*x])^(5/2)*(a + I*a*Tan[c + d*x])),x]
```

```
[Out] (14*EllipticE[(c + d*x)/2, 2])/(15*a*d*e^2*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c
+ d*x]]) + (14*Sin[c + d*x])/(45*a*d*e*(e*Sec[c + d*x])^(3/2)) + ((2*I)/9)/
(d*(e*Sec[c + d*x])^(5/2)*(a + I*a*Tan[c + d*x]))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{1}{(e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))}\,dx = \frac{2i}{9d(e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))} + \frac{7\int \frac{1}{(e\sec(c+dx))^{5/2}}\,dx}{9a}$$

$$= \frac{14\sin(c+dx)}{45ade(e\sec(c+dx))^{3/2}} + \frac{2i}{9d(e\sec(c+dx))^{5/2}(a+ia\tan(c+dx)}$$

$$= \frac{14\sin(c+dx)}{45ade(e\sec(c+dx))^{3/2}} + \frac{2i}{9d(e\sec(c+dx))^{5/2}(a+ia\tan(c+dx)}$$

$$= \frac{14E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15ade^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} + \frac{14\sin(c+dx)}{45ade(e\sec(c+dx))^{3/2}} +$$

Mathematica [C] time = 1.14, size = 134, normalized size = 1.18

$$\frac{(\tan(c+dx)+i)\left(-56e^{2i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)+70i\sin(2(c+dx))-7i\sin(4(c+dx))+1}{180ade^2\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Sec[c + d*x])^(5/2)*(a + I*a*Tan[c + d*x])),x]
```

```
[Out] ((106 + 104*Cos[2*(c + d*x)] - 2*Cos[4*(c + d*x)] - 56*E^((2*I)*(c + d*x))*
Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c
 + d*x))] + (70*I)*Sin[2*(c + d*x)] - (7*I)*Sin[4*(c + d*x)])*(I + Tan[c +
d*x]))/(180*a*d*e^2*Sqrt[e*Sec[c + d*x]])
```

fricas [F] time = 0.63, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(-9i\,e^{(9i\,dx+9i\,c)}+9i\,e^{(8i\,dx+8i\,c)}-162i\,e^{(7i\,dx+7i\,c)}-174i\,e^{(6i\,dx+6i\,c)}-124i\,e^{(5i\,dx+5i\,c)}-212i\,e^{(4i\,dx+}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/360*(sqrt(2)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(-9*I*e^(9*I*d*x + 9*I*c)
+ 9*I*e^(8*I*d*x + 8*I*c) - 162*I*e^(7*I*d*x + 7*I*c) - 174*I*e^(6*I*d*x +
6*I*c) - 124*I*e^(5*I*d*x + 5*I*c) - 212*I*e^(4*I*d*x + 4*I*c) + 34*I*e^(3*
I*d*x + 3*I*c) - 34*I*e^(2*I*d*x + 2*I*c) + 5*I*e^(I*d*x + I*c) - 5*I)*e^(1
/2*I*d*x + 1/2*I*c) + 360*(a*d*e^3*e^(6*I*d*x + 6*I*c) - a*d*e^3*e^(5*I*d*x
 + 5*I*c))*integral(1/15*sqrt(2)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(-7*I*e^
(2*I*d*x + 2*I*c) - 14*I*e^(I*d*x + I*c) - 7*I)*e^(1/2*I*d*x + 1/2*I*c)/(a*
d*e^3*e^(3*I*d*x + 3*I*c) - 2*a*d*e^3*e^(2*I*d*x + 2*I*c) + a*d*e^3*e^(I*d*
x + I*c)), x))/(a*d*e^3*e^(6*I*d*x + 6*I*c) - a*d*e^3*e^(5*I*d*x + 5*I*c))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\sec(dx+c))^{\frac{5}{2}}\,(i\,a\tan(dx+c)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(1/((e*sec(d*x + c))^(5/2)*(I*a*tan(d*x + c) + a)), x)
```

maple [B] time = 1.55, size = 376, normalized size = 3.30

$$\frac{2\left(\cos^{2}\left(dx+c\right)\right)\left(\frac{e}{\cos\left(dx+c\right)}\right)^{\frac{5}{2}}\left(-1+\cos\left(dx+c\right)\right)^{2}\left(1+\cos\left(dx+c\right)\right)^{2}\left(5i\left(\cos^{5}\left(dx+c\right)\right)\sin\left(dx+c\right)+21i\cos\left(dx\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] 2/45/a/d*cos(d*x+c)^2*(e/cos(d*x+c))^(5/2)*(-1+cos(d*x+c))^2*(1+cos(d*x+c))
^2*(5*I*cos(d*x+c)^5*sin(d*x+c)+21*I*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(c
os(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*s
in(d*x+c)-21*I*cos(d*x+c)*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)-5*cos(d*x+c)
^6+21*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+
c)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-21*I*sin(d*x+c)*(1/(1+cos(d*x+
c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/si
n(d*x+c),I)-2*cos(d*x+c)^4-14*cos(d*x+c)^2+21*cos(d*x+c))/e^5/sin(d*x+c)^5
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(\frac{e}{\cos\left(c+d\,x\right)}\right)}^{5/2}\,\left(a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e/cos(c + d*x))^(5/2)*(a + a*tan(c + d*x)*1i)),x)
```

```
[Out] int(1/((e/cos(c + d*x))^(5/2)*(a + a*tan(c + d*x)*1i)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\int \frac{1}{\left(e\sec\left(c+dx\right)\right)^{\frac{5}{2}}\tan\left(c+dx\right)-i\left(e\sec\left(c+dx\right)\right)^{\frac{5}{2}}}\, dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))**(5/2)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] -I*Integral(1/((e*sec(c + d*x))**(5/2)*tan(c + d*x) - I*(e*sec(c + d*x))**(
5/2)), x)/a
```

3.232 $\int \frac{1}{(e\sec(c+dx))^{7/2}(a+ia\tan(c+dx))}\,dx$

Optimal. Leaf size=145

$$\frac{30\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{77ade^4}+\frac{30\sin(c+dx)}{77ade^3\sqrt{e\sec(c+dx)}}+\frac{18\sin(c+dx)}{77ade(e\sec(c+dx))^{5/2}}+\frac{}{11d(a+ia\,t}$$

```
[Out] 18/77*sin(d*x+c)/a/d/e/(e*sec(d*x+c))^(5/2)+30/77*sin(d*x+c)/a/d/e^3/(e*sec
(d*x+c))^(1/2)+30/77*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipt
icF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(d*x+c))^(1/2)/a/d/e
^4+2/11*I/d/(e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))
```

Rubi [A] time = 0.11, antiderivative size = 145, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3502, 3769, 3771, 2641}

$$\frac{30\sin(c+dx)}{77ade^3\sqrt{e\sec(c+dx)}}+\frac{30\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{77ade^4}+\frac{18\sin(c+dx)}{77ade(e\sec(c+dx))^{5/2}}+\frac{}{11d(a+ia\,t}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Sec[c + d*x])^(7/2)*(a + I*a*Tan[c + d*x])),x]
```

```
[Out] (30*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(77*
a*d*e^4) + (18*Sin[c + d*x])/(77*a*d*e*(e*Sec[c + d*x])^(5/2)) + (30*Sin[c
+ d*x])/(77*a*d*e^3*Sqrt[e*Sec[c + d*x]]) + ((2*I)/11)/(d*(e*Sec[c + d*x])^
(7/2)*(a + I*a*Tan[c + d*x]))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{1}{(e\sec(c+dx))^{7/2}(a+ia\tan(c+dx))}\,dx = \frac{2i}{11d(e\sec(c+dx))^{7/2}(a+ia\tan(c+dx))} + \frac{9\int \frac{1}{(e\sec(c+dx))^{7/2}}\,dx}{11a}$$

$$= \frac{18\sin(c+dx)}{77ade(e\sec(c+dx))^{5/2}} + \frac{2i}{11d(e\sec(c+dx))^{7/2}(a+ia\tan(c+dx))}$$

$$= \frac{18\sin(c+dx)}{77ade(e\sec(c+dx))^{5/2}} + \frac{30\sin(c+dx)}{77ade^3\sqrt{e\sec(c+dx)}} + \frac{}{11d(e\sec(c+dx}$$

$$= \frac{18\sin(c+dx)}{77ade(e\sec(c+dx))^{5/2}} + \frac{30\sin(c+dx)}{77ade^3\sqrt{e\sec(c+dx)}} + \frac{}{11d(e\sec(c+dx}$$

$$= \frac{30\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{77ade^4} + \frac{18\sin(c+d}{77ade(e\sec(c+}$$

Mathematica [A] time = 0.85, size = 142, normalized size = 0.98

$$-\frac{(e\sec(c+dx))^{3/2}\left(78i\sin(c+dx)+87i\sin(3(c+dx))+9i\sin(5(c+dx))-148\cos(c+dx)+34\cos(3(c+dx))\right.}{616ade^5(\tan(c+dx)-i)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Sec[c + d*x])^(7/2)*(a + I*a*Tan[c + d*x])),x]
```

```
[Out] -1/616*((e*Sec[c + d*x])^(3/2)*(-148*Cos[c + d*x] + 34*Cos[3*(c + d*x)] + 2
*Cos[5*(c + d*x)] + (240*I)*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*(C
os[c + d*x] + I*Sin[c + d*x]) + (78*I)*Sin[c + d*x] + (87*I)*Sin[3*(c + d*x
)] + (9*I)*Sin[5*(c + d*x)]))/(a*d*e^5*(-I + Tan[c + d*x]))
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\frac{\left(1232\,ade^4e^{(6i\,dx+6i\,c)}\mathrm{integral}\left(-\frac{15i\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{77\,ade^4},x\right)+\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(-11i\,e^{(10i\,dx+10i\,c)}-121i\,e^{(8i\,dx+}\right.\right.}{1232\,ade^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/1232*(1232*a*d*e^4*e^(6*I*d*x + 6*I*c)*integral(-15/77*I*sqrt(2)*sqrt(e/(
e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(a*d*e^4), x) + sqrt(2)*
sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(-11*I*e^(10*I*d*x + 10*I*c) - 121*I*e^(8
*I*d*x + 8*I*c) + 70*I*e^(6*I*d*x + 6*I*c) + 226*I*e^(4*I*d*x + 4*I*c) + 53
*I*e^(2*I*d*x + 2*I*c) + 7*I)*e^(1/2*I*d*x + 1/2*I*c))*e^(-6*I*d*x - 6*I*c)
/(a*d*e^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\sec(dx+c))^{\frac{7}{2}}\,(i\,a\tan(dx+c)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(1/((e*sec(d*x + c))^(7/2)*(I*a*tan(d*x + c) + a)), x)
```

maple [A] time = 1.40, size = 236, normalized size = 1.63

$$\frac{2\left(\frac{e}{\cos(dx+c)}\right)^{\frac{7}{2}}(-1+\cos(dx+c))^2(1+\cos(dx+c))^2\left(\cos^3(dx+c)\right)\left(7i\left(\cos^6(dx+c)\right)+7\left(\cos^5(dx+c)\right)\sin\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] 2/77/a/d*(e/cos(d*x+c))^(7/2)*(-1+cos(d*x+c))^2*(1+cos(d*x+c))^2*cos(d*x+c)
^3*(7*I*cos(d*x+c)^6+7*cos(d*x+c)^5*sin(d*x+c)+15*I*(1/(1+cos(d*x+c)))^(1/2
)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),
I)*cos(d*x+c)+9*cos(d*x+c)^3*sin(d*x+c)+15*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(
d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)+15*c
os(d*x+c)*sin(d*x+c))/e^7/sin(d*x+c)^4
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\left(\frac{e}{\cos(c+d\,x)}\right)^{7/2}\,(a+a\,\tan(c+d\,x)\,1\mathrm{i})}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e/cos(c + d*x))^(7/2)*(a + a*tan(c + d*x)*1i)),x)
```

```
[Out] int(1/((e/cos(c + d*x))^(7/2)*(a + a*tan(c + d*x)*1i)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\int \frac{1}{(e\sec(c+dx))^{\frac{7}{2}}\tan(c+dx)-i(e\sec(c+dx))^{\frac{7}{2}}}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))**(7/2)/(a+I*a*tan(d*x+c)),x)
```

```
[Out] -I*Integral(1/((e*sec(c + d*x))**(7/2)*tan(c + d*x) - I*(e*sec(c + d*x))**(
7/2)), x)/a
```

3.233 $\int \frac{(e\sec(c+dx))^{15/2}}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=183

$$-\frac{22e^8E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15a^2d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{22e^7\sin(c+dx)\sqrt{e\sec(c+dx)}}{15a^2d}+\frac{22e^5\sin(c+dx)(e\sec(c+dx))^{5/2}}{45a^2d}+$$

```
[Out] 22/45*e^5*(e*sec(d*x+c))^(5/2)*sin(d*x+c)/a^2/d+22/63*e^3*(e*sec(d*x+c))^(9
/2)*sin(d*x+c)/a^2/d-22/15*e^8*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2
*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/a^2/d/cos(d*x+c)^(1/2)/(e*sec(d*x
+c))^(1/2)+22/15*e^7*sin(d*x+c)*(e*sec(d*x+c))^(1/2)/a^2/d-4/7*I*e^2*(e*sec
(d*x+c))^(11/2)/d/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.13, antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {3500, 3768, 3771, 2639}

$$\frac{22e^7\sin(c+dx)\sqrt{e\sec(c+dx)}}{15a^2d}+\frac{22e^5\sin(c+dx)(e\sec(c+dx))^{5/2}}{45a^2d}+\frac{22e^3\sin(c+dx)(e\sec(c+dx))^{9/2}}{63a^2d}-$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(15/2)/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (-22*e^8*EllipticE[(c + d*x)/2, 2])/(15*a^2*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec
[c + d*x]]) + (22*e^7*Sqrt[e*Sec[c + d*x]]*Sin[c + d*x])/(15*a^2*d) + (22*e
^5*(e*Sec[c + d*x])^(5/2)*Sin[c + d*x])/(45*a^2*d) + (22*e^3*(e*Sec[c + d*x
])^(9/2)*Sin[c + d*x])/(63*a^2*d) - (((4*I)/7)*e^2*(e*Sec[c + d*x])^(11/2))
/(d*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{15/2}}{(a+ia\tan(c+dx))^2}\,dx = -\frac{4ie^2(e\sec(c+dx))^{11/2}}{7d\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(11e^2\right)\int(e\sec(c+dx))^{11/2}\,dx}{7a^2}$$

$$= \frac{22e^3(e\sec(c+dx))^{9/2}\sin(c+dx)}{63a^2d} - \frac{4ie^2(e\sec(c+dx))^{11/2}}{7d\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(11e^4\right)\int(e\sec(c}{9a^2}$$

$$= \frac{22e^5(e\sec(c+dx))^{5/2}\sin(c+dx)}{45a^2d} + \frac{22e^3(e\sec(c+dx))^{9/2}\sin(c+dx)}{63a^2d} - \frac{4ie^2(e}{7d\left(a^2+\right.}$$

$$= \frac{22e^7\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{15a^2d} + \frac{22e^5(e\sec(c+dx))^{5/2}\sin(c+dx)}{45a^2d} + \frac{22e^3(e\sec}{}$$

$$= \frac{22e^7\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{15a^2d} + \frac{22e^5(e\sec(c+dx))^{5/2}\sin(c+dx)}{45a^2d} + \frac{22e^3(e\sec}{}$$

$$= -\frac{22e^8E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15a^2d\sqrt{\cos(c+dx)}\,\sqrt{e\sec(c+dx)}} + \frac{22e^7\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{15a^2d} + \frac{22e^5(e}{}$$

Mathematica [C] time = 2.47, size = 302, normalized size = 1.65

$$\frac{(\cos(dx)+i\sin(dx))^2(e\sec(c+dx))^{15/2}\left(\frac{22i\sqrt{2}e^{3ic-idx}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\sqrt{1+e^{2i(c+dx)}}\left(\left(-1+e^{2ic}\right)e^{2idx}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)-3\sqrt{1+e^{2i(c+}\right.}{-1+e^{2ic}}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(15/2)/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] ((e*Sec[c + d*x])^(15/2)*(Cos[d*x] + I*Sin[d*x])^2*(((22*I)*Sqrt[2]*E^((3*I
)*c - I*d*x)*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x)))]*Sqrt[1 + E^((2
*I)*(c + d*x))]*(-3*Sqrt[1 + E^((2*I)*(c + d*x))] + E^((2*I)*d*x)*(-1 + E^(
(2*I)*c))*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x))]))/(-1 + E^
((2*I)*c)) + (Csc[c]*Sec[c + d*x]^(9/2)*(Cos[2*c] + I*Sin[2*c])*(1260*Cos[d
*x] + 1050*Cos[2*c + d*x] + 1078*Cos[2*c + 3*d*x] + 77*Cos[4*c + 3*d*x] + 2
31*Cos[4*c + 5*d*x] + (720*I)*Sin[d*x] - (720*I)*Sin[2*c + d*x]))/56))/(45*
d*Sec[c + d*x]^(11/2)*(a + I*a*Tan[c + d*x])^2)
```

fricas [F] time = 0.65, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-462ie^7e^{(9idx+9ic)} - 2156ie^7e^{(7idx+7ic)} - 3960ie^7e^{(5idx+5ic)} - 3540ie^7e^{(3idx+3ic)} - 154ie^7e^{(idx+ic)}\right)\sqrt{\frac{e}{e^{(2idx+2i}}}}{315\left(a^2de^{(8idx+8ic)} + 4a^2d\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(15/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/315*(sqrt(2)*(-462*I*e^7*e^(9*I*d*x + 9*I*c) - 2156*I*e^7*e^(7*I*d*x + 7*
I*c) - 3960*I*e^7*e^(5*I*d*x + 5*I*c) - 3540*I*e^7*e^(3*I*d*x + 3*I*c) - 15
4*I*e^7*e^(I*d*x + I*c))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1
/2*I*c) + 315*(a^2*d*e^(8*I*d*x + 8*I*c) + 4*a^2*d*e^(6*I*d*x + 6*I*c) + 6*
```

```
a^2*d*e^(4*I*d*x + 4*I*c) + 4*a^2*d*e^(2*I*d*x + 2*I*c) + a^2*d)*integral(1
1/15*I*sqrt(2)*e^7*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c
)/(a^2*d), x))/(a^2*d*e^(8*I*d*x + 8*I*c) + 4*a^2*d*e^(6*I*d*x + 6*I*c) + 6
*a^2*d*e^(4*I*d*x + 4*I*c) + 4*a^2*d*e^(2*I*d*x + 2*I*c) + a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e \sec(dx+c))^{\frac{15}{2}}}{(i a \tan(dx+c)+a)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(15/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(15/2)/(I*a*tan(d*x + c) + a)^2, x)
```

maple [B] time = 1.34, size = 384, normalized size = 2.10

$$-\frac{2(1+\cos(dx+c))^2(-1+\cos(dx+c))^2\left(231i\left(\cos^5(dx+c)\right)\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c}{\sin(dx+c)}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(15/2)/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] -2/315/a^2/d*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(231*I*cos(d*x+c)^5*(1/(1+c
os(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x
+c))/sin(d*x+c),I)*sin(d*x+c)-231*I*cos(d*x+c)^5*(1/(1+cos(d*x+c)))^(1/2)*(
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*
sin(d*x+c)+231*I*cos(d*x+c)^4*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d
*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(d*x+c)-231*I*co
s(d*x+c)^4*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Ellip
ticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(d*x+c)+231*cos(d*x+c)^5-154*cos(d*
x+c)^4+90*I*cos(d*x+c)*sin(d*x+c)-112*cos(d*x+c)^2+35)*(e/cos(d*x+c))^(15/2
)*cos(d*x+c)^3/sin(d*x+c)^5
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(15/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{15/2}}{(a+a\tan(c+d\,x)\,1\mathrm{i})^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(15/2)/(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] int((e/cos(c + d*x))^(15/2)/(a + a*tan(c + d*x)*1i)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(15/2)/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Timed out
```

3.234 $\int \frac{(e\sec(c+dx))^{13/2}}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=152

$$\frac{6e^6\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{7a^2d}+\frac{6e^5\sin(c+dx)(e\sec(c+dx))^{3/2}}{7a^2d}+\frac{18e^3\sin(c+dx)(e\sec(c+dx}{35a^2d}$$

```
[Out] 6/7*e^5*(e*sec(d*x+c))^(3/2)*sin(d*x+c)/a^2/d+18/35*e^3*(e*sec(d*x+c))^(7/2
)*sin(d*x+c)/a^2/d+6/7*e^6*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*
EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(d*x+c))^(1/2)
/a^2/d-4/5*I*e^2*(e*sec(d*x+c))^(9/2)/d/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.11, antiderivative size = 152, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3500, 3768, 3771, 2641}

$$\frac{6e^5\sin(c+dx)(e\sec(c+dx))^{3/2}}{7a^2d}+\frac{18e^3\sin(c+dx)(e\sec(c+dx))^{7/2}}{35a^2d}-\frac{4ie^2(e\sec(c+dx))^{9/2}}{5d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{6e^6\sqrt{\cos(c+dx)}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(13/2)/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (6*e^6*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(
7*a^2*d) + (6*e^5*(e*Sec[c + d*x])^(3/2)*Sin[c + d*x])/(7*a^2*d) + (18*e^3*
(e*Sec[c + d*x])^(7/2)*Sin[c + d*x])/(35*a^2*d) - (((4*I)/5)*e^2*(e*Sec[c +
 d*x])^(9/2))/(d*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{13/2}}{(a+ia\tan(c+dx))^2}\,dx = -\frac{4ie^2(e\sec(c+dx))^{9/2}}{5d\left(a^2+ia^2\tan(c+dx)\right)} + \frac{(9e^2)\int (e\sec(c+dx))^{9/2}\,dx}{5a^2}$$

$$= \frac{18e^3(e\sec(c+dx))^{7/2}\sin(c+dx)}{35a^2d} - \frac{4ie^2(e\sec(c+dx))^{9/2}}{5d\left(a^2+ia^2\tan(c+dx)\right)} + \frac{(9e^4)\int (e\sec(c-}{7a^2}$$

$$= \frac{6e^5(e\sec(c+dx))^{3/2}\sin(c+dx)}{7a^2d} + \frac{18e^3(e\sec(c+dx))^{7/2}\sin(c+dx)}{35a^2d} - \frac{4ie^2(e\mathrm{s}}{5d\left(a^2+\right.}$$

$$= \frac{6e^5(e\sec(c+dx))^{3/2}\sin(c+dx)}{7a^2d} + \frac{18e^3(e\sec(c+dx))^{7/2}\sin(c+dx)}{35a^2d} - \frac{4ie^2(e\mathrm{s}}{5d\left(a^2+\right.}$$

$$= \frac{6e^6\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{7a^2d} + \frac{6e^5(e\sec(c+dx))^{3/2}\sin(c+}{7a^2d}$$

Mathematica [A] time = 0.58, size = 85, normalized size = 0.56

$$\frac{e^6\sec^3(c+dx)\sqrt{e\sec(c+dx)}\left(-5\sin(c+dx)+15\sin(3(c+dx))-56i\cos(c+dx)+60\cos^{\frac{7}{2}}(c+dx)F\left(\frac{1}{2}(c+\right.\right.}{70a^2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(13/2)/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (e^6*Sec[c + d*x]^3*Sqrt[e*Sec[c + d*x]]*((-56*I)*Cos[c + d*x] + 60*Cos[c +
 d*x]^(7/2)*EllipticF[(c + d*x)/2, 2] - 5*Sin[c + d*x] + 15*Sin[3*(c + d*x)
]))/(70*a^2*d)
```

fricas [F] time = 0.76, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-30i\,e^6e^{(6i\,dx+6i\,c)}-102i\,e^6e^{(4i\,dx+4i\,c)}-122i\,e^6e^{(2i\,dx+2i\,c)}+30i\,e^6\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+35\left(a^2de^{(6i\,dx+6i}\right.}{35\left(a^2de^{(6i\,dx+6i\,c)}+3\,a^2de^{(4i\,dx+4i\,c)}+3\,a^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(13/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/35*(sqrt(2)*(-30*I*e^6*e^(6*I*d*x + 6*I*c) - 102*I*e^6*e^(4*I*d*x + 4*I*c
) - 122*I*e^6*e^(2*I*d*x + 2*I*c) + 30*I*e^6)*sqrt(e/(e^(2*I*d*x + 2*I*c) +
 1))*e^(1/2*I*d*x + 1/2*I*c) + 35*(a^2*d*e^(6*I*d*x + 6*I*c) + 3*a^2*d*e^(4
*I*d*x + 4*I*c) + 3*a^2*d*e^(2*I*d*x + 2*I*c) + a^2*d)*integral(-3/7*I*sqrt
(2)*e^6*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(a^2*d),
 x))/(a^2*d*e^(6*I*d*x + 6*I*c) + 3*a^2*d*e^(4*I*d*x + 4*I*c) + 3*a^2*d*e^(
2*I*d*x + 2*I*c) + a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{13}{2}}}{(i\,a\tan(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(13/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

[Out] integrate((e*sec(d*x + c))^(13/2)/(I*a*tan(d*x + c) + a)^2, x)

maple [A] time = 1.25, size = 219, normalized size = 1.44

$$\frac{2\left(1+\cos\left(dx+c\right)\right)^{2}\left(-1+\cos\left(dx+c\right)\right)^{2}\left(15i\,\mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)\left(\cos^{4}\left(dx+c\right)\right)\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((e*sec(d*x+c))^(13/2)/(a+I*a*tan(d*x+c))^2,x)

[Out] 2/35/a^2/d*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(15*I*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)^4*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+15*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)^3+15*cos(d*x+c)^2*sin(d*x+c)-14*I*cos(d*x+c)-5*sin(d*x+c))*(e/cos(d*x+c))^(13/2)*cos(d*x+c)^3/sin(d*x+c)^4

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((e*sec(d*x+c))^(13/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")

[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is undefined.

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(\frac{e}{\cos\left(c+d\,x\right)}\right)}^{13/2}}{{\left(a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((e/cos(c + d*x))^(13/2)/(a + a*tan(c + d*x)*1i)^2,x)

[Out] int((e/cos(c + d*x))^(13/2)/(a + a*tan(c + d*x)*1i)^2, x)

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((e*sec(d*x+c))**(13/2)/(a+I*a*tan(d*x+c))**2,x)

[Out] Timed out

3.235 $\int \frac{(e\sec(c+dx))^{11/2}}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=152

$$-\frac{14e^6E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^2d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{14e^5\sin(c+dx)\sqrt{e\sec(c+dx)}}{5a^2d}+\frac{14e^3\sin(c+dx)(e\sec(c+dx))^{5/2}}{15a^2d}-\frac{4ie}{3d\,(a}$$

```
[Out] 14/15*e^3*(e*sec(d*x+c))^(5/2)*sin(d*x+c)/a^2/d-14/5*e^6*(cos(1/2*d*x+1/2*c
)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/a^2/d/c
os(d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)+14/5*e^5*sin(d*x+c)*(e*sec(d*x+c))^(1/
2)/a^2/d-4/3*I*e^2*(e*sec(d*x+c))^(7/2)/d/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.11, antiderivative size = 152, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {3500, 3768, 3771, 2639}

$$\frac{14e^5\sin(c+dx)\sqrt{e\sec(c+dx)}}{5a^2d}+\frac{14e^3\sin(c+dx)(e\sec(c+dx))^{5/2}}{15a^2d}-\frac{4ie^2(e\sec(c+dx))^{7/2}}{3d\left(a^2+ia^2\tan(c+dx)\right)}-\frac{14e^6E\left(\frac{1}{2}\right.}{5a^2d\sqrt{\cos(c+}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(11/2)/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (-14*e^6*EllipticE[(c + d*x)/2, 2])/(5*a^2*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[
c + d*x]]) + (14*e^5*Sqrt[e*Sec[c + d*x]]*Sin[c + d*x])/(5*a^2*d) + (14*e^3
*(e*Sec[c + d*x])^(5/2)*Sin[c + d*x])/(15*a^2*d) - (((4*I)/3)*e^2*(e*Sec[c
+ d*x])^(7/2))/(d*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{11/2}}{(a+ia\tan(c+dx))^2}\,dx = -\frac{4ie^2(e\sec(c+dx))^{7/2}}{3d\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(7e^2\right)\int(e\sec(c+dx))^{7/2}\,dx}{3a^2}$$

$$= \frac{14e^3(e\sec(c+dx))^{5/2}\sin(c+dx)}{15a^2d} - \frac{4ie^2(e\sec(c+dx))^{7/2}}{3d\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(7e^4\right)\int(e\sec(c+d}{5a^2}$$

$$= \frac{14e^5\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5a^2d} + \frac{14e^3(e\sec(c+dx))^{5/2}\sin(c+dx)}{15a^2d} - \frac{4ie^2(e\sec(}{3d\left(a^2+ia^2\,t\right.}$$

$$= \frac{14e^5\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5a^2d} + \frac{14e^3(e\sec(c+dx))^{5/2}\sin(c+dx)}{15a^2d} - \frac{4ie^2(e\sec(}{3d\left(a^2+ia^2\,t\right.}$$

$$= -\frac{14e^6E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^2d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} + \frac{14e^5\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5a^2d} + \frac{14e^3(e\sec(}{}$$

Mathematica [C] time = 0.98, size = 123, normalized size = 0.81

$$\frac{2ie^5e^{i(c+dx)}\left(7\left(1+e^{2i(c+dx)}\right)^{5/2}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)-56e^{2i(c+dx)}-21e^{4i(c+dx)}-47\right)\sqrt{e\sec(c+dx)}}{15a^2d\left(1+e^{2i(c+dx)}\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(11/2)/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (((2*I)/15)*e^5*E^(I*(c + d*x))*(-47 - 56*E^((2*I)*(c + d*x)) - 21*E^((4*I)
*(c + d*x)) + 7*(1 + E^((2*I)*(c + d*x)))^(5/2)*Hypergeometric2F1[1/2, 3/4,
 7/4, -E^((2*I)*(c + d*x))])*Sqrt[e*Sec[c + d*x]])/(a^2*d*(1 + E^((2*I)*(c
+ d*x)))^2)
```

fricas [F] time = 0.56, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-42i\,e^5e^{(5i\,dx+5i\,c)}-112i\,e^5e^{(3i\,dx+3i\,c)}-94i\,e^5e^{(i\,dx+i\,c)}\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+15\left(a^2de^{(4i\,dx+4i\,c)}+2\,a^2de^{(2i\,dx}\right.}{15\left(a^2de^{(4i\,dx+4i\,c)}+2\,a^2de^{(2i\,dx+2i\,c)}+a^2d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(11/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/15*(sqrt(2)*(-42*I*e^5*e^(5*I*d*x + 5*I*c) - 112*I*e^5*e^(3*I*d*x + 3*I*c
) - 94*I*e^5*e^(I*d*x + I*c))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*
x + 1/2*I*c) + 15*(a^2*d*e^(4*I*d*x + 4*I*c) + 2*a^2*d*e^(2*I*d*x + 2*I*c)
+ a^2*d)*integral(7/5*I*sqrt(2)*e^5*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/
2*I*d*x + 1/2*I*c)/(a^2*d), x))/(a^2*d*e^(4*I*d*x + 4*I*c) + 2*a^2*d*e^(2*I
*d*x + 2*I*c) + a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{11}{2}}}{(i\,a\tan(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(11/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(11/2)/(I*a*tan(d*x + c) + a)^2, x)
```

maple [B] time = 1.29, size = 374, normalized size = 2.46

$$-\frac{2\left(1+\cos\left(dx+c\right)\right)^{2}\left(-1+\cos\left(dx+c\right)\right)^{2}\left(21 i \sin\left(dx+c\right)\left(\cos^{3}\left(dx+c\right)\right)\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \mathrm{Elliptic}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(11/2)/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] -2/15/a^2/d*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(21*I*sin(d*x+c)*cos(d*x+c)^
3*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-
1+cos(d*x+c))/sin(d*x+c),I)-21*I*sin(d*x+c)*cos(d*x+c)^3*(1/(1+cos(d*x+c)))
^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*
x+c),I)+21*I*cos(d*x+c)^2*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-21*I*cos(d*x
+c)^2*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)+21*cos(d*x+c)^3+10*I*cos(d*x+c)*
sin(d*x+c)-24*cos(d*x+c)^2+3)*(e/cos(d*x+c))^(11/2)*cos(d*x+c)^3/sin(d*x+c)
^5
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(11/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{11/2}}{\left(a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(11/2)/(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] int((e/cos(c + d*x))^(11/2)/(a + a*tan(c + d*x)*1i)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(11/2)/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Timed out
```

3.236 $\int \frac{(e\sec(c+dx))^{9/2}}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=119

$$\frac{10e^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3a^2d}+\frac{10e^3\sin(c+dx)(e\sec(c+dx))^{3/2}}{3a^2d}-\frac{4ie^2(e\sec(c+dx))^{5/2}}{d\left(a^2+ia^2\tan(c+dx)\right)}$$

```
[Out] 10/3*e^3*(e*sec(d*x+c))^(3/2)*sin(d*x+c)/a^2/d+10/3*e^4*(cos(1/2*d*x+1/2*c)
^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+
c)^(1/2)*(e*sec(d*x+c))^(1/2)/a^2/d-4*I*e^2*(e*sec(d*x+c))^(5/2)/d/(a^2+I*a
^2*tan(d*x+c))
```

Rubi [A] time = 0.09, antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3500, 3768, 3771, 2641}

$$\frac{10e^3\sin(c+dx)(e\sec(c+dx))^{3/2}}{3a^2d}-\frac{4ie^2(e\sec(c+dx))^{5/2}}{d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{10e^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3a^2d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(9/2)/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (10*e^4*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/
(3*a^2*d) + (10*e^3*(e*Sec[c + d*x])^(3/2)*Sin[c + d*x])/(3*a^2*d) - ((4*I)
*e^2*(e*Sec[c + d*x])^(5/2))/(d*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{9/2}}{(a+ia\tan(c+dx))^2}\,dx = -\frac{4ie^2(e\sec(c+dx))^{5/2}}{d\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(5e^2\right)\int (e\sec(c+dx))^{5/2}\,dx}{a^2}$$

$$= \frac{10e^3(e\sec(c+dx))^{3/2}\sin(c+dx)}{3a^2d} - \frac{4ie^2(e\sec(c+dx))^{5/2}}{d\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(5e^4\right)\int \sqrt{e\sec(c}{3a^2}$$

$$= \frac{10e^3(e\sec(c+dx))^{3/2}\sin(c+dx)}{3a^2d} - \frac{4ie^2(e\sec(c+dx))^{5/2}}{d\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(5e^4\sqrt{\cos(c+dx)}\right.}{}$$

$$= \frac{10e^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3a^2d} + \frac{10e^3(e\sec(c+dx))^{3/2}\sin(c}{3a^2d}$$

Mathematica [A] time = 0.37, size = 67, normalized size = 0.56

$$\frac{2e^3(e\sec(c+dx))^{3/2}\left(-\sin(c+dx)-6i\cos(c+dx)+5\cos^{\frac{3}{2}}(c+dx)F\left(\frac{1}{2}(c+dx)\middle|2\right)\right)}{3a^2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(9/2)/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (2*e^3*(e*Sec[c + d*x])^(3/2)*((-6*I)*Cos[c + d*x] + 5*Cos[c + d*x]^(3/2)*E
llipticF[(c + d*x)/2, 2] - Sin[c + d*x]))/(3*a^2*d)
```

fricas [F] time = 0.81, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-10i\,e^4e^{(2i\,dx+2i\,c)}-14i\,e^4\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+3\left(a^2de^{(2i\,dx+2i\,c)}+a^2d\right)\mathrm{integral}\left(-\frac{5i\sqrt{2}\,e^4\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e}{3\,a^2d}\right.}{3\left(a^2de^{(2i\,dx+2i\,c)}+a^2d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(9/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/3*(sqrt(2)*(-10*I*e^4*e^(2*I*d*x + 2*I*c) - 14*I*e^4)*sqrt(e/(e^(2*I*d*x
+ 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 3*(a^2*d*e^(2*I*d*x + 2*I*c) + a^2
*d)*integral(-5/3*I*sqrt(2)*e^4*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I
*d*x - 1/2*I*c)/(a^2*d), x))/(a^2*d*e^(2*I*d*x + 2*I*c) + a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{9}{2}}}{(i\,a\tan(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(9/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(9/2)/(I*a*tan(d*x + c) + a)^2, x)
```

maple [A] time = 1.18, size = 201, normalized size = 1.69

$$\frac{2\left(1+\cos(dx+c)\right)^2\left(-1+\cos(dx+c)\right)^2\left(5i\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\left(\cos^2(dx+c)\right)\mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(9/2)/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 2/3/a^2/d*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(5*I*EllipticF(I*(-1+cos(d*x+c
))/sin(d*x+c),I)*cos(d*x+c)^2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d
*x+c)))^(1/2)+5*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2
)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)-6*I*cos(d*x+c)-sin(d
*x+c))*(e/cos(d*x+c))^(9/2)*cos(d*x+c)^3/sin(d*x+c)^4
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(9/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{9/2}}{\left(a+a\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(9/2)/(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] int((e/cos(c + d*x))^(9/2)/(a + a*tan(c + d*x)*1i)^2, x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(9/2)/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Timed out
```

3.237 $\int \frac{(e\sec(c+dx))^{7/2}}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=115

$$\frac{6e^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{6e^3\sin(c+dx)\sqrt{e\sec(c+dx)}}{a^2d}+\frac{4ie^2(e\sec(c+dx))^{3/2}}{d\left(a^2+ia^2\tan(c+dx)\right)}$$

```
[Out] 6*e^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x
+1/2*c),2^(1/2))/a^2/d/cos(d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)-6*e^3*sin(d*x+
c)*(e*sec(d*x+c))^(1/2)/a^2/d+4*I*e^2*(e*sec(d*x+c))^(3/2)/d/(a^2+I*a^2*tan
(d*x+c))
```

Rubi [A] time = 0.09, antiderivative size = 115, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3500, 3768, 3771, 2639}

$$-\frac{6e^3\sin(c+dx)\sqrt{e\sec(c+dx)}}{a^2d}+\frac{4ie^2(e\sec(c+dx))^{3/2}}{d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{6e^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(7/2)/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (6*e^4*EllipticE[(c + d*x)/2, 2])/(a^2*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c +
d*x]]) - (6*e^3*Sqrt[e*Sec[c + d*x]]*Sin[c + d*x])/(a^2*d) + ((4*I)*e^2*(e*
Sec[c + d*x])^(3/2))/(d*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{7/2}}{(a+ia\tan(c+dx))^2}\,dx = \frac{4ie^2(e\sec(c+dx))^{3/2}}{d\left(a^2+ia^2\tan(c+dx)\right)} - \frac{\left(3e^2\right)\int(e\sec(c+dx))^{3/2}\,dx}{a^2}$$

$$= -\frac{6e^3\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{a^2d} + \frac{4ie^2(e\sec(c+dx))^{3/2}}{d\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(3e^4\right)\int\frac{1}{\sqrt{e\sec(c+dx)}}\,dx}{a^2}$$

$$= -\frac{6e^3\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{a^2d} + \frac{4ie^2(e\sec(c+dx))^{3/2}}{d\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(3e^4\right)\int\sqrt{\cos(c+}}{a^2\sqrt{\cos(c+dx)}\,\sqrt{e\sec}}$$

$$= \frac{6e^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d\sqrt{\cos(c+dx)}\,\sqrt{e\sec(c+dx)}} - \frac{6e^3\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{a^2d} + \frac{4ie^2(e\sec(c+}{d\left(a^2+ia^2\tan\right.}$$

Mathematica [C] time = 0.53, size = 80, normalized size = 0.70

$$\frac{2ie^3e^{-i(c+dx)}\left(-1+3\sqrt{1+e^{2i(c+dx)}}\,{}_2F_1\left(-\frac{1}{4},\frac{1}{2};\frac{3}{4};-e^{2i(c+dx)}\right)\right)\sqrt{e\sec(c+dx)}}{a^2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(7/2)/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] ((2*I)*e^3*(-1 + 3*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/
2, 3/4, -E^((2*I)*(c + d*x))])*Sqrt[e*Sec[c + d*x]])/(a^2*d*E^(I*(c + d*x))
)
```

fricas [F] time = 0.54, size = 0, normalized size = 0.00

$$\frac{\left(a^2de^{(i\,dx+i\,c)}\text{integral}\left(-\frac{3i\,\sqrt{2}\,e^3\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}}{a^2d},x\right)+\sqrt{2}\left(6i\,e^3e^{(2i\,dx+2i\,c)}+4i\,e^3\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}\right)e^{(-i\,d}}{a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] (a^2*d*e^(I*d*x + I*c)*integral(-3*I*sqrt(2)*e^3*sqrt(e/(e^(2*I*d*x + 2*I*c
) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(a^2*d), x) + sqrt(2)*(6*I*e^3*e^(2*I*d*x +
 2*I*c) + 4*I*e^3)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c
))*e^(-I*d*x - I*c)/(a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{7}{2}}}{(i\,a\tan(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(7/2)/(I*a*tan(d*x + c) + a)^2, x)
```

maple [B] time = 1.22, size = 352, normalized size = 3.06

$$-\frac{2\left(\frac{e}{\cos(dx+c)}\right)^{\frac{7}{2}}(-1+\cos(dx+c))^2\left(\cos^3(dx+c)\right)(1+\cos(dx+c))^2\left(-3i\cos(dx+c)\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] -2/a^2/d*(e/cos(d*x+c))^(7/2)*(-1+cos(d*x+c))^2*cos(d*x+c)^3*(1+cos(d*x+c))
^2*(-3*I*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(d*x+c)+3*I*cos(d*x+c)*(1/
(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos
(d*x+c))/sin(d*x+c),I)*sin(d*x+c)-3*I*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c
),I)*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+
3*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)*E
llipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)-2*I*cos(d*x+c)*sin(d*x+c)+2*cos(d*
x+c)^2-3*cos(d*x+c)+1)/sin(d*x+c)^5
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{7/2}}{\left(a+a\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(7/2)/(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] int((e/cos(c + d*x))^(7/2)/(a + a*tan(c + d*x)*1i)^2, x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(7/2)/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Timed out
```

3.238 $\int \frac{(e\sec(c+dx))^{5/2}}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=90

$$-\frac{2e^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3a^2d}+\frac{4ie^2\sqrt{e\sec(c+dx)}}{3d\left(a^2+ia^2\tan(c+dx)\right)}$$

```
[Out] -2/3*e^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*
d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(d*x+c))^(1/2)/a^2/d+4/3*I*e^2*(
e*sec(d*x+c))^(1/2)/d/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.07, antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.107, Rules used = {3500, 3771, 2641}

$$-\frac{2e^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3a^2d}+\frac{4ie^2\sqrt{e\sec(c+dx)}}{3d\left(a^2+ia^2\tan(c+dx)\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(5/2)/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (-2*e^2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/
(3*a^2*d) + (((4*I)/3)*e^2*Sqrt[e*Sec[c + d*x]])/(d*(a^2 + I*a^2*Tan[c + d*
x]))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{5/2}}{(a+ia\tan(c+dx))^2}\,dx = \frac{4ie^2\sqrt{e\sec(c+dx)}}{3d\left(a^2+ia^2\tan(c+dx)\right)} - \frac{e^2\int\sqrt{e\sec(c+dx)}\,dx}{3a^2}$$
$$= \frac{4ie^2\sqrt{e\sec(c+dx)}}{3d\left(a^2+ia^2\tan(c+dx)\right)} - \frac{\left(e^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}\right)\int\frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3a^2}$$
$$= -\frac{2e^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3a^2d} + \frac{4ie^2\sqrt{e\sec(c+dx)}}{3d\left(a^2+ia^2\tan(c+dx)\right)}$$

Mathematica [A] time = 0.43, size = 101, normalized size = 1.12

$$\frac{2(e\sec(c+dx))^{5/2}(\cos(c+dx)+i\sin(c+dx))\left(\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)(\cos(c+dx)+i\sin(c+dx))-2\right.}{3a^2d(\tan(c+dx)-i)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(5/2)/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (2*(e*Sec[c + d*x])^(5/2)*((-2*I)*Cos[c + d*x] + Sqrt[Cos[c + d*x]]*Ellipti
cF[(c + d*x)/2, 2]*(Cos[c + d*x] + I*Sin[c + d*x]))*(Cos[c + d*x] + I*Sin[c
 + d*x]))/(3*a^2*d*(-I + Tan[c + d*x])^2)
```

fricas [F] time = 1.01, size = 0, normalized size = 0.00

$$\frac{\left(3\,a^2de^{(2i\,dx+2i\,c)}\text{integral}\left(\frac{i\sqrt{2}e^2\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{3\,a^2d},x\right)+\sqrt{2}\left(2i\,e^2e^{(2i\,dx+2i\,c)}+2i\,e^2\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}\right.}{3\,a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/3*(3*a^2*d*e^(2*I*d*x + 2*I*c)*integral(1/3*I*sqrt(2)*e^2*sqrt(e/(e^(2*I*
d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(a^2*d), x) + sqrt(2)*(2*I*e^2*
e^(2*I*d*x + 2*I*c) + 2*I*e^2)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d
*x + 1/2*I*c))*e^(-2*I*d*x - 2*I*c)/(a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{5}{2}}}{(i\,a\tan(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(5/2)/(I*a*tan(d*x + c) + a)^2, x)
```

maple [A] time = 1.13, size = 201, normalized size = 2.23

$$\frac{2\left(\cos^2(dx+c)\right)\left(\frac{e}{\cos(dx+c)}\right)^{\frac{5}{2}}(-1+\cos(dx+c))^2(1+\cos(dx+c))^2\left(-i\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \text{EllipticF}\left(\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 2/3/a^2/d*cos(d*x+c)^2*(e/cos(d*x+c))^(5/2)*(-1+cos(d*x+c))^2*(1+cos(d*x+c)
)^2*(-I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Elliptic
F(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)-I*(1/(1+cos(d*x+c)))^(1/2)*(co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)+2*
I*cos(d*x+c)^2+2*cos(d*x+c)*sin(d*x+c))/sin(d*x+c)^4
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{5/2}}{\left(a+a\tan\left(c+d\,x\right)\,1\mathrm{i}\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(5/2)/(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] int((e/cos(c + d*x))^(5/2)/(a + a*tan(c + d*x)*1i)^2, x)
```

sympy [**F**] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{(e\sec(c+dx))^{\frac{5}{2}}}{\tan^2(c+dx)-2i\tan(c+dx)-1}\,dx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(5/2)/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -Integral((e*sec(c + d*x))**(5/2)/(tan(c + d*x)**2 - 2*I*tan(c + d*x) - 1),
 x)/a**2
```

3.239 $\int \frac{(e\sec(c+dx))^{3/2}}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=90

$$\frac{2e^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^2d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{4ie^2}{5d\left(a^2+ia^2\tan(c+dx)\right)\sqrt{e\sec(c+dx)}}$$

```
[Out] 2/5*e^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d
*x+1/2*c),2^(1/2))/a^2/d/cos(d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)+4/5*I*e^2/d/
(e*sec(d*x+c))^(1/2)/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.07, antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.107, Rules used = {3500, 3771, 2639}

$$\frac{2e^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^2d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{4ie^2}{5d\left(a^2+ia^2\tan(c+dx)\right)\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(3/2)/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (2*e^2*EllipticE[(c + d*x)/2, 2])/(5*a^2*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c
+ d*x]]) + (((4*I)/5)*e^2)/(d*Sqrt[e*Sec[c + d*x]]*(a^2 + I*a^2*Tan[c + d*x
]))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{3/2}}{(a+ia\tan(c+dx))^2}\,dx = \frac{4ie^2}{5d\sqrt{e\sec(c+dx)}\left(a^2+ia^2\tan(c+dx)\right)} + \frac{e^2\int \frac{1}{\sqrt{e\sec(c+dx)}}\,dx}{5a^2}$$

$$= \frac{4ie^2}{5d\sqrt{e\sec(c+dx)}\left(a^2+ia^2\tan(c+dx)\right)} + \frac{e^2\int\sqrt{\cos(c+dx)}\,dx}{5a^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}$$

$$= \frac{2e^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^2d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} + \frac{4ie^2}{5d\sqrt{e\sec(c+dx)}\left(a^2+ia^2\tan(c+dx)\right)}$$

Mathematica [C] time = 0.58, size = 102, normalized size = 1.13

$$\frac{iee^{-3i(c+dx)}\left(2e^{2i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\,{}_2F_1\left(-\frac{1}{4},\frac{1}{2};\frac{3}{4};-e^{2i(c+dx)}\right)+e^{2i(c+dx)}+1\right)\sqrt{e\sec(c+dx)}}{5a^2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(3/2)/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] ((I/5)*e*(1 + E^((2*I)*(c + d*x)) + 2*E^((2*I)*(c + d*x))*Sqrt[1 + E^((2*I)
*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x))])*Sqrt[
e*Sec[c + d*x]])/(a^2*d*E^((3*I)*(c + d*x)))
```

fricas [F] time = 0.65, size = 0, normalized size = 0.00

$$\frac{\left(5\,a^2de^{(3i\,dx+3i\,c)}\text{integral}\left(-\frac{i\,\sqrt{2}\,e\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}}{5\,a^2d},x\right)+\sqrt{2}\left(2i\,ee^{(4i\,dx+4i\,c)}+3i\,ee^{(2i\,dx+2i\,c)}+i\,e\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{(}\right.}{5\,a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/5*(5*a^2*d*e^(3*I*d*x + 3*I*c)*integral(-1/5*I*sqrt(2)*e*sqrt(e/(e^(2*I*d
*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(a^2*d), x) + sqrt(2)*(2*I*e*e^(4
*I*d*x + 4*I*c) + 3*I*e*e^(2*I*d*x + 2*I*c) + I*e)*sqrt(e/(e^(2*I*d*x + 2*I
*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))*e^(-3*I*d*x - 3*I*c)/(a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{3}{2}}}{(i\,a\tan(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(3/2)/(I*a*tan(d*x + c) + a)^2, x)
```

maple [B] time = 1.18, size = 361, normalized size = 4.01

$$-\frac{2\left(i\cos(dx+c)\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\text{EllipticE}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)\sin(dx+c)-i\cos(dx+c)\sqrt{\frac{1}{1+\cos(dx+c)}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] -2/5/a^2/d*(I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*co
s(d*x+c)*sin(d*x+c)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)-I*(1/(1+cos(d
*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)*sin(d*x+c)*Ellip
ticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-2*I*cos(d*x+c)^3*sin(d*x+c)+I*(1/(1+co
s(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)*EllipticE(I*(
-1+cos(d*x+c))/sin(d*x+c),I)-I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(
d*x+c)))^(1/2)*sin(d*x+c)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)+2*cos(d
*x+c)^4-cos(d*x+c)^2-cos(d*x+c))*cos(d*x+c)*(1+cos(d*x+c))^2*(-1+cos(d*x+c)
)^2*(e/cos(d*x+c))^(3/2)/sin(d*x+c)^5
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{3/2}}{\left(a+a\tan\left(c+d\,x\right)\,1\mathrm{i}\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(3/2)/(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] int((e/cos(c + d*x))^(3/2)/(a + a*tan(c + d*x)*1i)^2, x)
```

sympy [**F**] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{(e\sec(c+dx))^{\frac{3}{2}}}{\tan^2(c+dx)-2i\tan(c+dx)-1}\,dx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(3/2)/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -Integral((e*sec(c + d*x))**(3/2)/(tan(c + d*x)**2 - 2*I*tan(c + d*x) - 1),
 x)/a**2
```

3.240 $\int \frac{\sqrt{e\sec(c+dx)}}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=116

$$\frac{4ie^2}{7d\left(a^2+ia^2\tan(c+dx)\right)(e\sec(c+dx))^{3/2}}+\frac{2e\sin(c+dx)}{7a^2d\sqrt{e\sec(c+dx)}}+\frac{2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{7a^2d}$$

```
[Out] 2/7*e*sin(d*x+c)/a^2/d/(e*sec(d*x+c))^(1/2)+2/7*(cos(1/2*d*x+1/2*c)^2)^(1/2
)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)
*(e*sec(d*x+c))^(1/2)/a^2/d+4/7*I*e^2/d/(e*sec(d*x+c))^(3/2)/(a^2+I*a^2*tan
(d*x+c))
```

Rubi [A] time = 0.08, antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3500, 3769, 3771, 2641}

$$\frac{4ie^2}{7d\left(a^2+ia^2\tan(c+dx)\right)(e\sec(c+dx))^{3/2}}+\frac{2e\sin(c+dx)}{7a^2d\sqrt{e\sec(c+dx)}}+\frac{2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{7a^2d}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Sec[c + d*x]]/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(7*a^
2*d) + (2*e*Sin[c + d*x])/(7*a^2*d*Sqrt[e*Sec[c + d*x]]) + (((4*I)/7)*e^2)/
(d*(e*Sec[c + d*x])^(3/2)*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{\sqrt{e\sec(c+dx)}}{(a+ia\tan(c+dx))^2}\,dx = \frac{4ie^2}{7d(e\sec(c+dx))^{3/2}\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(3e^2\right)\int \frac{1}{(e\sec(c+dx))^{3/2}}\,dx}{7a^2}$$

$$= \frac{2e\sin(c+dx)}{7a^2d\sqrt{e\sec(c+dx)}} + \frac{4ie^2}{7d(e\sec(c+dx))^{3/2}\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\int\sqrt{e\sec(c+}}{7a^2}$$

$$= \frac{2e\sin(c+dx)}{7a^2d\sqrt{e\sec(c+dx)}} + \frac{4ie^2}{7d(e\sec(c+dx))^{3/2}\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(\sqrt{\cos(c+d}\right.}{}$$

$$= \frac{2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{7a^2d} + \frac{2e\sin(c+dx)}{7a^2d\sqrt{e\sec(c+dx)}} + \frac{}{7d(e\,\mathrm{se}}$$

Mathematica [A] time = 0.46, size = 112, normalized size = 0.97

$$-\frac{\sec^2(c+dx)\sqrt{e\sec(c+dx)}\left(-\sin(2(c+dx))+2i\cos(2(c+dx))+2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)(\cos(2(c+\right.}{7a^2d(\tan(c+dx)-i)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Sec[c + d*x]]/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] -1/7*(Sec[c + d*x]^2*Sqrt[e*Sec[c + d*x]]*(2*I + (2*I)*Cos[2*(c + d*x)] + 2
*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*(Cos[2*(c + d*x)] + I*Sin[2*(
c + d*x)]) - Sin[2*(c + d*x)]))/(a^2*d*(-I + Tan[c + d*x])^2)
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\frac{\left(14\,a^2de^{(4i\,dx+4i\,c)}\mathrm{integral}\left(-\frac{i\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{7\,a^2d},x\right)+\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(3i\,e^{(4i\,dx+4i\,c)}+4i\,e^{(2i\,dx+2i\,c)}+i\right)e\right.}{14\,a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/14*(14*a^2*d*e^(4*I*d*x + 4*I*c)*integral(-1/7*I*sqrt(2)*sqrt(e/(e^(2*I*d
*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(a^2*d), x) + sqrt(2)*sqrt(e/(e^
(2*I*d*x + 2*I*c) + 1))*(3*I*e^(4*I*d*x + 4*I*c) + 4*I*e^(2*I*d*x + 2*I*c)
+ I)*e^(1/2*I*d*x + 1/2*I*c))*e^(-4*I*d*x - 4*I*c)/(a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\sec\left(dx+c\right)}}{\left(i\,a\tan\left(dx+c\right)+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*sec(d*x + c))/(I*a*tan(d*x + c) + a)^2, x)
```

maple [A] time = 1.00, size = 180, normalized size = 1.55

$$\frac{2\sqrt{\frac{e}{\cos(dx+c)}}\left(i\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\;\mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)\cos\left(dx+c\right)+2i\left(\cos^4\left(dx+c\right)\right)+i\sqrt{\frac{}{1+\mathrm{co}}}\right.}{7a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 2/7/a^2/d*(e/cos(d*x+c))^(1/2)*(I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)+2*I*
cos(d*x+c)^4+I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*E
llipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)+2*cos(d*x+c)^3*sin(d*x+c)+cos(d*x+
c)*sin(d*x+c))
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{\frac{e}{\cos(c+d\,x)}}}{{\left(a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(1/2)/(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] int((e/cos(c + d*x))^(1/2)/(a + a*tan(c + d*x)*1i)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{\sqrt{e \sec{\left(c+dx \right)}}}{\tan^{2}{\left(c+dx \right)} - 2 i \tan{\left(c+dx \right)} - 1}\, dx}{a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(1/2)/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -Integral(sqrt(e*sec(c + d*x))/(tan(c + d*x)**2 - 2*I*tan(c + d*x) - 1), x)
/a**2
```

3.241 $\int \frac{1}{\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=116

$$\frac{4ie^2}{9d\left(a^2+ia^2\tan(c+dx)\right)(e\sec(c+dx))^{5/2}}+\frac{2e\sin(c+dx)}{9a^2d(e\sec(c+dx))^{3/2}}+\frac{2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{3a^2d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}$$

```
[Out] 2/9*e*sin(d*x+c)/a^2/d/(e*sec(d*x+c))^(3/2)+2/3*(cos(1/2*d*x+1/2*c)^2)^(1/2
)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/a^2/d/cos(d*x+c)
^(1/2)/(e*sec(d*x+c))^(1/2)+4/9*I*e^2/d/(e*sec(d*x+c))^(5/2)/(a^2+I*a^2*tan
(d*x+c))
```

Rubi [A] time = 0.08, antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3500, 3769, 3771, 2639}

$$\frac{4ie^2}{9d\left(a^2+ia^2\tan(c+dx)\right)(e\sec(c+dx))^{5/2}}+\frac{2e\sin(c+dx)}{9a^2d(e\sec(c+dx))^{3/2}}+\frac{2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{3a^2d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^2),x]
```

```
[Out] (2*EllipticE[(c + d*x)/2, 2])/(3*a^2*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c + d*
x]]) + (2*e*Sin[c + d*x])/(9*a^2*d*(e*Sec[c + d*x])^(3/2)) + (((4*I)/9)*e^2
)/(d*(e*Sec[c + d*x])^(5/2)*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{1}{\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^2}\,dx = \frac{4ie^2}{9d(e\sec(c+dx))^{5/2}\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(5e^2\right)\int \frac{1}{(e\sec(c+dx))^{5/2}}\,dx}{9a^2}$$

$$= \frac{2e\sin(c+dx)}{9a^2d(e\sec(c+dx))^{3/2}} + \frac{4ie^2}{9d(e\sec(c+dx))^{5/2}\left(a^2+ia^2\tan(c+dx)\right)}$$

$$= \frac{2e\sin(c+dx)}{9a^2d(e\sec(c+dx))^{3/2}} + \frac{4ie^2}{9d(e\sec(c+dx))^{5/2}\left(a^2+ia^2\tan(c+dx)\right)}$$

$$= \frac{2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{3a^2d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} + \frac{2e\sin(c+dx)}{9a^2d(e\sec(c+dx))^{3/2}} + \frac{}{9d(e\sec}$$

Mathematica [C] time = 1.45, size = 123, normalized size = 1.06

$$\frac{(\sin(2(c+dx))+i\cos(2(c+dx)))\left(2(7i\sin(2(c+dx))+8\cos(2(c+dx))+2)-\frac{8e^{4i(c+dx)}\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)}{\sqrt{1+e^{2i(c+dx)}}}\right)}{18a^2d\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^2),x]
```

```
[Out] (((-8*E^((4*I)*(c + d*x))*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d
*x))])/Sqrt[1 + E^((2*I)*(c + d*x))] + 2*(2 + 8*Cos[2*(c + d*x)] + (7*I)*Si
n[2*(c + d*x)]))*(I*Cos[2*(c + d*x)] + Sin[2*(c + d*x)]))/(18*a^2*d*Sqrt[e*
Sec[c + d*x]])
```

fricas [F] time = 0.62, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(-9i\,e^{(7i\,dx+7i\,c)}-15i\,e^{(6i\,dx+6i\,c)}-5i\,e^{(5i\,dx+5i\,c)}-19i\,e^{(4i\,dx+4i\,c)}+5i\,e^{(3i\,dx+3i\,c)}-5i\,e^{(2i\,dx+2i\,c)}+i\,e^{(id}\right.}{36\left(a^2dee^{(6i\,dx+6}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas"
)
```

```
[Out] 1/36*(sqrt(2)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(-9*I*e^(7*I*d*x + 7*I*c) -
 15*I*e^(6*I*d*x + 6*I*c) - 5*I*e^(5*I*d*x + 5*I*c) - 19*I*e^(4*I*d*x + 4*I
*c) + 5*I*e^(3*I*d*x + 3*I*c) - 5*I*e^(2*I*d*x + 2*I*c) + I*e^(I*d*x + I*c)
 - I)*e^(1/2*I*d*x + 1/2*I*c) + 36*(a^2*d*e*e^(6*I*d*x + 6*I*c) - a^2*d*e*e
^(5*I*d*x + 5*I*c))*integral(1/3*sqrt(2)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*
(-I*e^(2*I*d*x + 2*I*c) - 2*I*e^(I*d*x + I*c) - I)*e^(1/2*I*d*x + 1/2*I*c)/
(a^2*d*e*e^(3*I*d*x + 3*I*c) - 2*a^2*d*e*e^(2*I*d*x + 2*I*c) + a^2*d*e*e^(I
*d*x + I*c)), x))/(a^2*d*e*e^(6*I*d*x + 6*I*c) - a^2*d*e*e^(5*I*d*x + 5*I*c
))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{e\sec(dx+c)}\,(i\,a\tan(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(e*sec(d*x + c))*(I*a*tan(d*x + c) + a)^2), x)
```

maple [B] time = 1.42, size = 366, normalized size = 3.16

$$2\left(2i\left(\cos^{5}\left(dx+c\right)\right)\sin\left(dx+c\right)+3i\cos\left(dx+c\right)\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)\sin\left(d\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 2/9/a^2/d*(2*I*cos(d*x+c)^5*sin(d*x+c)+3*I*sin(d*x+c)*cos(d*x+c)*(1/(1+cos(
d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c)
)/sin(d*x+c),I)-3*I*sin(d*x+c)*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x
+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)-2*cos(d
*x+c)^6+3*I*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-3*I*sin(d*x+c)*(1/(1+cos(d
*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))
/sin(d*x+c),I)+cos(d*x+c)^4-2*cos(d*x+c)^2+3*cos(d*x+c))*(1+cos(d*x+c))^2*(
-1+cos(d*x+c))^2*(e/cos(d*x+c))^(1/2)/sin(d*x+c)^5/e
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\sqrt{\frac{e}{\cos(c+d\,x)}}\,\left(a+a\tan\left(c+d\,x\right)\,1\mathrm{i}\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^2),x)
```

```
[Out] int(1/((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{1}{\sqrt{e\sec\left(c+dx\right)}\tan^{2}\left(c+dx\right)-2i\sqrt{e\sec\left(c+dx\right)}\tan\left(c+dx\right)-\sqrt{e\sec\left(c+dx\right)}}\,dx}{a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))**(1/2)/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -Integral(1/(sqrt(e*sec(c + d*x))*tan(c + d*x)**2 - 2*I*sqrt(e*sec(c + d*x)
)*tan(c + d*x) - sqrt(e*sec(c + d*x))), x)/a**2
```

3.242 $\int \frac{1}{(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=150

$$\frac{4ie^2}{11d\left(a^2+ia^2\tan(c+dx)\right)(e\sec(c+dx))^{7/2}}+\frac{10\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{33a^2de^2}+\frac{2e\sin(c+dx)}{11a^2d(e\sec(c+dx}$$

```
[Out] 2/11*e*sin(d*x+c)/a^2/d/(e*sec(d*x+c))^(5/2)+10/33*sin(d*x+c)/a^2/d/e/(e*se
c(d*x+c))^(1/2)+10/33*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellip
ticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(d*x+c))^(1/2)/a^2/
d/e^2+4/11*I*e^2/d/(e*sec(d*x+c))^(7/2)/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.11, antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3500, 3769, 3771, 2641}

$$\frac{4ie^2}{11d\left(a^2+ia^2\tan(c+dx)\right)(e\sec(c+dx))^{7/2}}+\frac{10\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{33a^2de^2}+\frac{2e\sin(c+dx)}{11a^2d(e\sec(c+dx}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^2),x]
```

```
[Out] (10*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(33*
a^2*d*e^2) + (2*e*Sin[c + d*x])/(11*a^2*d*(e*Sec[c + d*x])^(5/2)) + (10*Sin
[c + d*x])/(33*a^2*d*e*Sqrt[e*Sec[c + d*x]]) + (((4*I)/11)*e^2)/(d*(e*Sec[c
 + d*x])^(7/2)*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{1}{(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^2}\,dx = \frac{4ie^2}{11d(e\sec(c+dx))^{7/2}\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(7e^2\right)\int \frac{1}{(e\sec(c+dx)}}{11a^2}$$

$$= \frac{2e\sin(c+dx)}{11a^2d(e\sec(c+dx))^{5/2}} + \frac{4ie^2}{11d(e\sec(c+dx))^{7/2}\left(a^2+ia^2\tan(c+\right.}$$

$$= \frac{2e\sin(c+dx)}{11a^2d(e\sec(c+dx))^{5/2}} + \frac{10\sin(c+dx)}{33a^2de\sqrt{e\sec(c+dx)}} + \frac{}{11d(e\sec(c-}$$

$$= \frac{2e\sin(c+dx)}{11a^2d(e\sec(c+dx))^{5/2}} + \frac{10\sin(c+dx)}{33a^2de\sqrt{e\sec(c+dx)}} + \frac{}{11d(e\sec(c-}$$

$$= \frac{10\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{33a^2de^2} + \frac{2e\sin(c}{11a^2d(e\sec(}$$

Mathematica [A] time = 0.61, size = 134, normalized size = 0.89

$$-\frac{\sec^4(c+dx)\left(-6\sin(2(c+dx))+7\sin(4(c+dx))+24i\cos(2(c+dx))-4i\cos(4(c+dx))+40\sqrt{\cos(c+dx)}\right.}{132a^2d(\tan(c+dx)-i)^2(e\sec(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^2),x]
```

```
[Out] -1/132*(Sec[c + d*x]^4*(28*I + (24*I)*Cos[2*(c + d*x)] - (4*I)*Cos[4*(c + d
*x)] + 40*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*(Cos[2*(c + d*x)] +
I*Sin[2*(c + d*x)]) - 6*Sin[2*(c + d*x)] + 7*Sin[4*(c + d*x)]))/(a^2*d*(e*S
ec[c + d*x])^(3/2)*(-I + Tan[c + d*x])^2)
```

fricas [F] time = 0.70, size = 0, normalized size = 0.00

$$\frac{\left(264\,a^2de^2e^{(6i\,dx+6i\,c)}\text{integral}\left(-\frac{5i\,\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{33\,a^2de^2},x\right)+\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(-11i\,e^{(8i\,dx+8i\,c)}+30i\,e^{(6i\,dx+6}\right.\right.}{264\,a^2de^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas"
)
```

```
[Out] 1/264*(264*a^2*d*e^2*e^(6*I*d*x + 6*I*c)*integral(-5/33*I*sqrt(2)*sqrt(e/(e
^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(a^2*d*e^2), x) + sqrt(2)
*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(-11*I*e^(8*I*d*x + 8*I*c) + 30*I*e^(6*I
*d*x + 6*I*c) + 56*I*e^(4*I*d*x + 4*I*c) + 18*I*e^(2*I*d*x + 2*I*c) + 3*I)*
e^(1/2*I*d*x + 1/2*I*c))*e^(-6*I*d*x - 6*I*c)/(a^2*d*e^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\sec(dx+c))^{\frac{3}{2}}(i\,a\tan(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((e*sec(d*x + c))^(3/2)*(I*a*tan(d*x + c) + a)^2), x)
```

maple [A] time = 1.40, size = 234, normalized size = 1.56

$$\frac{2\cos\left(dx+c\right)\left(\frac{e}{\cos(dx+c)}\right)^{\frac{3}{2}}\left(-1+\cos\left(dx+c\right)\right)^{2}\left(1+\cos\left(dx+c\right)\right)^{2}\left(6i\left(\cos^{6}\left(dx+c\right)\right)+6\left(\cos^{5}\left(dx+c\right)\right)\sin\left(dx+\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 2/33/a^2/d*cos(d*x+c)*(e/cos(d*x+c))^(3/2)*(-1+cos(d*x+c))^2*(1+cos(d*x+c))
^2*(6*I*cos(d*x+c)^6+6*cos(d*x+c)^5*sin(d*x+c)+5*I*(1/(1+cos(d*x+c)))^(1/2)
*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I
)*cos(d*x+c)+5*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)+3*cos(d*x+c)^3*sin(d*x+c)+5*cos(
d*x+c)*sin(d*x+c))/e^3/sin(d*x+c)^4
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\left(\frac{e}{\cos(c+d\,x)}\right)^{3/2}\,\left(a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^2),x)
```

```
[Out] int(1/((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{1}{\left(e\sec\left(c+dx\right)\right)^{\frac{3}{2}}\tan^{2}\left(c+dx\right)-2i\left(e\sec\left(c+dx\right)\right)^{\frac{3}{2}}\tan\left(c+dx\right)-\left(e\sec\left(c+dx\right)\right)^{\frac{3}{2}}}\,dx}{a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))**(3/2)/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -Integral(1/((e*sec(c + d*x))**(3/2)*tan(c + d*x)**2 - 2*I*(e*sec(c + d*x))
**(3/2)*tan(c + d*x) - (e*sec(c + d*x))**(3/2)), x)/a**2
```

3.243 $\int \frac{1}{(e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=150

$$\frac{4ie^2}{13d\left(a^2+ia^2\tan(c+dx)\right)(e\sec(c+dx))^{9/2}}+\frac{42E\left(\frac{1}{2}(c+dx)\middle|2\right)}{65a^2de^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{2e\sin(c+dx)}{13a^2d(e\sec(c+dx))^{7/2}}+\frac{}{6}$$

```
[Out] 2/13*e*sin(d*x+c)/a^2/d/(e*sec(d*x+c))^(7/2)+14/65*sin(d*x+c)/a^2/d/e/(e*se
c(d*x+c))^(3/2)+42/65*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellip
ticE(sin(1/2*d*x+1/2*c),2^(1/2))/a^2/d/e^2/cos(d*x+c)^(1/2)/(e*sec(d*x+c))^
(1/2)+4/13*I*e^2/d/(e*sec(d*x+c))^(9/2)/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.11, antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3500, 3769, 3771, 2639}

$$\frac{4ie^2}{13d\left(a^2+ia^2\tan(c+dx)\right)(e\sec(c+dx))^{9/2}}+\frac{42E\left(\frac{1}{2}(c+dx)\middle|2\right)}{65a^2de^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{2e\sin(c+dx)}{13a^2d(e\sec(c+dx))^{7/2}}+\frac{}{6}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Sec[c + d*x])^(5/2)*(a + I*a*Tan[c + d*x])^2),x]
```

```
[Out] (42*EllipticE[(c + d*x)/2, 2])/(65*a^2*d*e^2*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[
c + d*x]]) + (2*e*Sin[c + d*x])/(13*a^2*d*(e*Sec[c + d*x])^(7/2)) + (14*Sin
[c + d*x])/(65*a^2*d*e*(e*Sec[c + d*x])^(3/2)) + (((4*I)/13)*e^2)/(d*(e*Sec
[c + d*x])^(9/2)*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{1}{(e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))^2}\,dx = \frac{4ie^2}{13d(e\sec(c+dx))^{9/2}\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(9e^2\right)\int \frac{1}{(e\sec(c+dx))^{9/2}}}{13a^2}$$

$$= \frac{2e\sin(c+dx)}{13a^2d(e\sec(c+dx))^{7/2}} + \frac{4ie^2}{13d(e\sec(c+dx))^{9/2}\left(a^2+ia^2\tan(c+dx\right.}$$

$$= \frac{2e\sin(c+dx)}{13a^2d(e\sec(c+dx))^{7/2}} + \frac{14\sin(c+dx)}{65a^2de(e\sec(c+dx))^{3/2}} + \frac{}{13d(e\sec(c+}$$

$$= \frac{2e\sin(c+dx)}{13a^2d(e\sec(c+dx))^{7/2}} + \frac{14\sin(c+dx)}{65a^2de(e\sec(c+dx))^{3/2}} + \frac{}{13d(e\sec(c+}$$

$$= \frac{42E\left(\frac{1}{2}(c+dx)\middle|2\right)}{65a^2de^2\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} + \frac{2e\sin(c+dx)}{13a^2d(e\sec(c+dx))^{7/2}} +$$

Mathematica [C] time = 2.22, size = 149, normalized size = 0.99

$$\frac{(\cos(2(c+dx))-i\sin(2(c+dx)))\left(-\frac{224ie^{4i(c+dx)}\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)}{\sqrt{1+e^{2i(c+dx)}}}-356\sin(2(c+dx))+18\sin(4(c+dx))+416i\,c\right.}{520a^2de^2\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Sec[c + d*x])^(5/2)*(a + I*a*Tan[c + d*x])^2),x]
```

```
[Out] ((Cos[2*(c + d*x)] - I*Sin[2*(c + d*x)])*(88*I + (416*I)*Cos[2*(c + d*x)] -
 (8*I)*Cos[4*(c + d*x)] - ((224*I)*E^((4*I)*(c + d*x))*Hypergeometric2F1[1/
2, 3/4, 7/4, -E^((2*I)*(c + d*x))])/Sqrt[1 + E^((2*I)*(c + d*x))] - 356*Sin
[2*(c + d*x)] + 18*Sin[4*(c + d*x)]))/(520*a^2*d*e^2*Sqrt[e*Sec[c + d*x]])
```

fricas [F] time = 0.67, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(-13i\,e^{(11i\,dx+11i\,c)}+13i\,e^{(10i\,dx+10i\,c)}-299i\,e^{(9i\,dx+9i\,c)}-373i\,e^{(8i\,dx+8i\,c)}-198i\,e^{(7i\,dx+7i\,c)}-474i\,e^{(6i\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas"
)
```

```
[Out] 1/1040*(sqrt(2)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(-13*I*e^(11*I*d*x + 11*I
*c) + 13*I*e^(10*I*d*x + 10*I*c) - 299*I*e^(9*I*d*x + 9*I*c) - 373*I*e^(8*I
*d*x + 8*I*c) - 198*I*e^(7*I*d*x + 7*I*c) - 474*I*e^(6*I*d*x + 6*I*c) + 118
*I*e^(5*I*d*x + 5*I*c) - 118*I*e^(4*I*d*x + 4*I*c) + 35*I*e^(3*I*d*x + 3*I*
c) - 35*I*e^(2*I*d*x + 2*I*c) + 5*I*e^(I*d*x + I*c) - 5*I)*e^(1/2*I*d*x + 1
/2*I*c) + 1040*(a^2*d*e^3*e^(8*I*d*x + 8*I*c) - a^2*d*e^3*e^(7*I*d*x + 7*I*
c))*integral(1/65*sqrt(2)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(-21*I*e^(2*I*d
*x + 2*I*c) - 42*I*e^(I*d*x + I*c) - 21*I)*e^(1/2*I*d*x + 1/2*I*c)/(a^2*d*e
^3*e^(3*I*d*x + 3*I*c) - 2*a^2*d*e^3*e^(2*I*d*x + 2*I*c) + a^2*d*e^3*e^(I*d
*x + I*c)), x))/(a^2*d*e^3*e^(8*I*d*x + 8*I*c) - a^2*d*e^3*e^(7*I*d*x + 7*I
*c))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\sec(dx+c))^{\frac{5}{2}}\,(i\,a\tan(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((e*sec(d*x + c))^(5/2)*(I*a*tan(d*x + c) + a)^2), x)
```

maple [B] time = 1.60, size = 386, normalized size = 2.57

$$-\frac{2\,(-1+\cos(dx+c))^2\,(1+\cos(dx+c))^2\left(\cos^2(dx+c)\right)\left(\frac{e}{\cos(dx+c)}\right)^{\frac{5}{2}}\left(-10i\left(\cos^7(dx+c)\right)\sin(dx+c)+10\left(\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] -2/65/a^2/d*(-1+cos(d*x+c))^2*(1+cos(d*x+c))^2*cos(d*x+c)^2*(e/cos(d*x+c))^
(5/2)*(-10*I*cos(d*x+c)^7*sin(d*x+c)+10*cos(d*x+c)^8-5*cos(d*x+c)^6+21*I*El
lipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)*sin(d*x+c)*(1/(1+cos(d*x
+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-21*I*EllipticF(I*(-1+cos(d*x+
c))/sin(d*x+c),I)*cos(d*x+c)*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)+21*I*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(
d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-21*I*Elli
pticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+2*cos(d*x+c)^4+14*cos(d*x+c)^2-21*cos(d*x+
c))/e^5/sin(d*x+c)^5
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\left(\frac{e}{\cos(c+d\,x)}\right)^{5/2}\,(a+a\tan(c+d\,x)\,1\mathrm{i})^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e/cos(c + d*x))^(5/2)*(a + a*tan(c + d*x)*1i)^2),x)
```

```
[Out] int(1/((e/cos(c + d*x))^(5/2)*(a + a*tan(c + d*x)*1i)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{1}{(e\sec(c+dx))^{\frac{5}{2}}\tan^2(c+dx)-2i(e\sec(c+dx))^{\frac{5}{2}}\tan(c+dx)-(e\sec(c+dx))^{\frac{5}{2}}}\,dx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))**(5/2)/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -Integral(1/((e*sec(c + d*x))**(5/2)*tan(c + d*x)**2 - 2*I*(e*sec(c + d*x))
**(5/2)*tan(c + d*x) - (e*sec(c + d*x))**(5/2)), x)/a**2
```

3.244 $\int \frac{1}{(e\sec(c+dx))^{7/2}(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=181

$$\frac{2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{7a^2de^4}+\frac{2\sin(c+dx)}{7a^2de^3\sqrt{e\sec(c+dx)}}+\frac{4ie^2}{15d\left(a^2+ia^2\tan(c+dx)\right)(e\sec(c+d$$

```
[Out] 2/15*e*sin(d*x+c)/a^2/d/(e*sec(d*x+c))^(9/2)+6/35*sin(d*x+c)/a^2/d/e/(e*sec
(d*x+c))^(5/2)+2/7*sin(d*x+c)/a^2/d/e^3/(e*sec(d*x+c))^(1/2)+2/7*(cos(1/2*d
*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))
*cos(d*x+c)^(1/2)*(e*sec(d*x+c))^(1/2)/a^2/d/e^4+4/15*I*e^2/d/(e*sec(d*x+c)
)^(11/2)/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.13, antiderivative size = 181, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3500, 3769, 3771, 2641}

$$\frac{2\sin(c+dx)}{7a^2de^3\sqrt{e\sec(c+dx)}}+\frac{4ie^2}{15d\left(a^2+ia^2\tan(c+dx)\right)(e\sec(c+dx))^{11/2}}+\frac{2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c}{7a^2de^4}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Sec[c + d*x])^(7/2)*(a + I*a*Tan[c + d*x])^2),x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(7*a^
2*d*e^4) + (2*e*Sin[c + d*x])/(15*a^2*d*(e*Sec[c + d*x])^(9/2)) + (6*Sin[c
+ d*x])/(35*a^2*d*e*(e*Sec[c + d*x])^(5/2)) + (2*Sin[c + d*x])/(7*a^2*d*e^3
*Sqrt[e*Sec[c + d*x]]) + (((4*I)/15)*e^2)/(d*(e*Sec[c + d*x])^(11/2)*(a^2 +
 I*a^2*Tan[c + d*x]))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{1}{(e\sec(c+dx))^{7/2}(a+ia\tan(c+dx))^2}\,dx = \frac{4ie^2}{15d(e\sec(c+dx))^{11/2}\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(11e^2\right)\int \frac{1}{(e\sec(c+dx))^{1}}}{15a^2}$$

$$= \frac{2e\sin(c+dx)}{15a^2d(e\sec(c+dx))^{9/2}} + \frac{4ie^2}{15d(e\sec(c+dx))^{11/2}\left(a^2+ia^2\tan(c+d\right.}$$

$$= \frac{2e\sin(c+dx)}{15a^2d(e\sec(c+dx))^{9/2}} + \frac{6\sin(c+dx)}{35a^2de(e\sec(c+dx))^{5/2}} + \frac{}{15d(e\sec(c+}$$

$$= \frac{2e\sin(c+dx)}{15a^2d(e\sec(c+dx))^{9/2}} + \frac{6\sin(c+dx)}{35a^2de(e\sec(c+dx))^{5/2}} + \frac{2\sin(c+}{7a^2de^3\sqrt{e\sec}}$$

$$= \frac{2e\sin(c+dx)}{15a^2d(e\sec(c+dx))^{9/2}} + \frac{6\sin(c+dx)}{35a^2de(e\sec(c+dx))^{5/2}} + \frac{2\sin(c+}{7a^2de^3\sqrt{e\sec}}$$

$$= \frac{2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{7a^2de^4} + \frac{2e\sin(c+d}{15a^2d(e\sec(c+}$$

Mathematica [A] time = 1.00, size = 151, normalized size = 0.83

$$-\frac{(e\sec(c+dx))^{5/2}\left(-17\sin(2(c+dx))+128\sin(4(c+dx))+11\sin(6(c+dx))+228i\cos(2(c+dx))-72i\cos(4\right.}{1680a^2de^6(\tan(}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Sec[c + d*x])^(7/2)*(a + I*a*Tan[c + d*x])^2),x]
```

```
[Out] -1/1680*((e*Sec[c + d*x])^(5/2)*(296*I + (228*I)*Cos[2*(c + d*x)] - (72*I)*
Cos[4*(c + d*x)] - (4*I)*Cos[6*(c + d*x)] + 480*Sqrt[Cos[c + d*x]]*Elliptic
F[(c + d*x)/2, 2]*(Cos[2*(c + d*x)] + I*Sin[2*(c + d*x)]) - 17*Sin[2*(c + d
*x)] + 128*Sin[4*(c + d*x)] + 11*Sin[6*(c + d*x)]))/(a^2*d*e^6*(-I + Tan[c
+ d*x])^2)
```

fricas [F] time = 0.81, size = 0, normalized size = 0.00

$$\frac{\left(3360\,a^2de^4e^{(8i\,dx+8i\,c)}\text{integral}\left(-\frac{i\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{7\,a^2de^4},x\right)+\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(-15i\,e^{(12i\,dx+12i\,c)}-200i\,e^{(10i\,dx}\right.\right.}{3360\,a^2de^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas"
)
```

```
[Out] 1/3360*(3360*a^2*d*e^4*e^(8*I*d*x + 8*I*c)*integral(-1/7*I*sqrt(2)*sqrt(e/(
e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(a^2*d*e^4), x) + sqrt(2
)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(-15*I*e^(12*I*d*x + 12*I*c) - 200*I*e^
(10*I*d*x + 10*I*c) + 245*I*e^(8*I*d*x + 8*I*c) + 592*I*e^(6*I*d*x + 6*I*c)
 + 211*I*e^(4*I*d*x + 4*I*c) + 56*I*e^(2*I*d*x + 2*I*c) + 7*I)*e^(1/2*I*d*x
 + 1/2*I*c))*e^(-8*I*d*x - 8*I*c)/(a^2*d*e^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\sec(dx+c))^{\frac{7}{2}}(i\,a\tan(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((e*sec(d*x + c))^(7/2)*(I*a*tan(d*x + c) + a)^2), x)
```

maple [A] time = 1.55, size = 252, normalized size = 1.39

$$\frac{2\left(\cos^{3}(dx+c)\right)\left(\frac{e}{\cos(dx+c)}\right)^{\frac{7}{2}}(-1+\cos(dx+c))^{2}(1+\cos(dx+c))^{2}\left(14i\left(\cos^{8}(dx+c)\right)+14\sin(dx+c)\left(\cos\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 2/105/a^2/d*cos(d*x+c)^3*(e/cos(d*x+c))^(7/2)*(-1+cos(d*x+c))^2*(1+cos(d*x+
c))^2*(14*I*cos(d*x+c)^8+14*sin(d*x+c)*cos(d*x+c)^7+7*cos(d*x+c)^5*sin(d*x+
c)+15*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Elliptic
F(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)+9*cos(d*x+c)^3*sin(d*x+c)+15*I
*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1
+cos(d*x+c))/sin(d*x+c),I)+15*cos(d*x+c)*sin(d*x+c))/e^7/sin(d*x+c)^4
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\left(\frac{e}{\cos(c+d\,x)}\right)^{7/2}\,\left(a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e/cos(c + d*x))^(7/2)*(a + a*tan(c + d*x)*1i)^2),x)
```

```
[Out] int(1/((e/cos(c + d*x))^(7/2)*(a + a*tan(c + d*x)*1i)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))**(7/2)/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Timed out
```

3.245 $\int \frac{(e\sec(c+dx))^{15/2}}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=178

$$-\frac{22e^8E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^3d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{22e^7\sin(c+dx)\sqrt{e\sec(c+dx)}}{5a^3d}+\frac{22e^5\sin(c+dx)(e\sec(c+dx))^{5/2}}{15a^3d}-\frac{22ie^4(e}{}$$

```
[Out] -22/21*I*e^4*(e*sec(d*x+c))^(7/2)/a^3/d+22/15*e^5*(e*sec(d*x+c))^(5/2)*sin(
d*x+c)/a^3/d-22/5*e^8*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellip
ticE(sin(1/2*d*x+1/2*c),2^(1/2))/a^3/d/cos(d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2
)+22/5*e^7*sin(d*x+c)*(e*sec(d*x+c))^(1/2)/a^3/d-4/3*I*e^2*(e*sec(d*x+c))^(
11/2)/a/d/(a+I*a*tan(d*x+c))^2
```

Rubi [A] time = 0.17, antiderivative size = 178, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {3500, 3501, 3768, 3771, 2639}

$$-\frac{22ie^4(e\sec(c+dx))^{7/2}}{21a^3d}+\frac{22e^7\sin(c+dx)\sqrt{e\sec(c+dx)}}{5a^3d}+\frac{22e^5\sin(c+dx)(e\sec(c+dx))^{5/2}}{15a^3d}-\frac{22e^8E\left(\frac{1}{2}(c\right.}{5a^3d\sqrt{\cos(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(15/2)/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (-22*e^8*EllipticE[(c + d*x)/2, 2])/(5*a^3*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[
c + d*x]]) - (((22*I)/21)*e^4*(e*Sec[c + d*x])^(7/2))/(a^3*d) + (22*e^7*Sqr
t[e*Sec[c + d*x]]*Sin[c + d*x])/(5*a^3*d) + (22*e^5*(e*Sec[c + d*x])^(5/2)*
Sin[c + d*x])/(15*a^3*d) - (((4*I)/3)*e^2*(e*Sec[c + d*x])^(11/2))/(a*d*(a
+ I*a*Tan[c + d*x])^2)
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
```

```
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{15/2}}{(a+ia\tan(c+dx))^3}\,dx = -\frac{4ie^2(e\sec(c+dx))^{11/2}}{3ad(a+ia\tan(c+dx))^2} + \frac{\left(11e^2\right)\int \frac{(e\sec(c+dx))^{11/2}}{a+ia\tan(c+dx)}\,dx}{3a^2}$$

$$= -\frac{22ie^4(e\sec(c+dx))^{7/2}}{21a^3d} - \frac{4ie^2(e\sec(c+dx))^{11/2}}{3ad(a+ia\tan(c+dx))^2} + \frac{\left(11e^4\right)\int (e\sec(c+dx))^{7/2}}{3a^3}$$

$$= -\frac{22ie^4(e\sec(c+dx))^{7/2}}{21a^3d} + \frac{22e^5(e\sec(c+dx))^{5/2}\sin(c+dx)}{15a^3d} - \frac{4ie^2(e\sec(c+d}{3ad(a+ia\tan(c}$$

$$= -\frac{22ie^4(e\sec(c+dx))^{7/2}}{21a^3d} + \frac{22e^7\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5a^3d} + \frac{22e^5(e\sec(c+dx))}{15a^3}$$

$$= -\frac{22ie^4(e\sec(c+dx))^{7/2}}{21a^3d} + \frac{22e^7\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5a^3d} + \frac{22e^5(e\sec(c+dx))}{15a^3}$$

$$= -\frac{22e^8E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^3d\sqrt{\cos(c+dx)}\,\sqrt{e\sec(c+dx)}} - \frac{22ie^4(e\sec(c+dx))^{7/2}}{21a^3d} + \frac{22e^7\sqrt{e\sec(c+}}{5a^3}$$

Mathematica [C] time = 1.65, size = 128, normalized size = 0.72

$$-\frac{e^6(\tan(c+dx)-i)(e\sec(c+dx))^{3/2}\left(77e^{-2i(c+dx)}\left(1+e^{2i(c+dx)}\right)^{5/2}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)-868\cos(2(c+dx))\right.}{210a^3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(15/2)/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] -1/210*(e^6*(e*Sec[c + d*x])^(3/2)*(-556 - 868*Cos[2*(c + d*x)] + (77*(1 +
E^((2*I)*(c + d*x)))^(5/2)*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c +
d*x))])/E^((2*I)*(c + d*x)) + (203*I)*Sec[c + d*x]*Sin[3*(c + d*x)] + (143*
I)*Tan[c + d*x])*(-I + Tan[c + d*x]))/(a^3*d)
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-462ie^7e^{(7idx+7ic)}-1694ie^7e^{(5idx+5ic)}-2266ie^7e^{(3idx+3ic)}-1274ie^7e^{(idx+ic)}\right)\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}\,e^{\left(\frac{1}{2}idx+\frac{1}{2}ic\right)}+1}{105\left(a^3de^{(6idx+6ic)}+3a^3de^{(4idx+4ic}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(15/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/105*(sqrt(2)*(-462*I*e^7*e^(7*I*d*x + 7*I*c) - 1694*I*e^7*e^(5*I*d*x + 5*
I*c) - 2266*I*e^7*e^(3*I*d*x + 3*I*c) - 1274*I*e^7*e^(I*d*x + I*c))*sqrt(e/
```

```
(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 105*(a^3*d*e^(6*I*d*x
+ 6*I*c) + 3*a^3*d*e^(4*I*d*x + 4*I*c) + 3*a^3*d*e^(2*I*d*x + 2*I*c) + a^3*
d)*integral(11/5*I*sqrt(2)*e^7*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d
*x + 1/2*I*c)/(a^3*d), x))/(a^3*d*e^(6*I*d*x + 6*I*c) + 3*a^3*d*e^(4*I*d*x
+ 4*I*c) + 3*a^3*d*e^(2*I*d*x + 2*I*c) + a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{15}{2}}}{(ia\tan(dx+c)+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(15/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(15/2)/(I*a*tan(d*x + c) + a)^3, x)
```

maple [B] time = 1.41, size = 392, normalized size = 2.20

$$-\frac{2(1+\cos(dx+c))^2(-1+\cos(dx+c))^2\left(231i\left(\cos^4(dx+c)\right)\sin(dx+c)\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\mathrm{EllipticF}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(15/2)/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] -2/105/a^3/d*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(231*I*cos(d*x+c)^4*(1/(1+c
os(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x
+c))/sin(d*x+c),I)*sin(d*x+c)-231*I*cos(d*x+c)^4*(1/(1+cos(d*x+c)))^(1/2)*(
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*
sin(d*x+c)+231*I*cos(d*x+c)^3*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-231*I*co
s(d*x+c)^3*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)+231*cos(d*x+c)^4+140*I*cos(
d*x+c)^2*sin(d*x+c)-294*cos(d*x+c)^3-15*I*sin(d*x+c)+63*cos(d*x+c))*(e/cos(
d*x+c))^(15/2)*cos(d*x+c)^4/sin(d*x+c)^5
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(15/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{15/2}}{(a+a\tan(c+d\,x)\,1\mathrm{i})^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(15/2)/(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] int((e/cos(c + d*x))^(15/2)/(a + a*tan(c + d*x)*1i)^3, x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(15/2)/(a+I*a*tan(d*x+c))**3,x)
[Out] Timed out
```

3.246 $\int \frac{(e\sec(c+dx))^{13/2}}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=141

$$\frac{6e^6\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{a^3d}+\frac{6e^5\sin(c+dx)(e\sec(c+dx))^{3/2}}{a^3d}-\frac{18ie^4(e\sec(c+dx))^{5/2}}{5a^3d}-\frac{4ie^2}{ad(a}$$

```
[Out] -18/5*I*e^4*(e*sec(d*x+c))^(5/2)/a^3/d+6*e^5*(e*sec(d*x+c))^(3/2)*sin(d*x+c
)/a^3/d+6*e^6*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin
(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(d*x+c))^(1/2)/a^3/d-4*I*e^
2*(e*sec(d*x+c))^(9/2)/a/d/(a+I*a*tan(d*x+c))^2
```

Rubi [A] time = 0.15, antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {3500, 3501, 3768, 3771, 2641}

$$-\frac{18ie^4(e\sec(c+dx))^{5/2}}{5a^3d}+\frac{6e^5\sin(c+dx)(e\sec(c+dx))^{3/2}}{a^3d}+\frac{6e^6\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{a^3d}-\frac{4i}{ad(}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(13/2)/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (6*e^6*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(
a^3*d) - (((18*I)/5)*e^4*(e*Sec[c + d*x])^(5/2))/(a^3*d) + (6*e^5*(e*Sec[c
+ d*x])^(3/2)*Sin[c + d*x])/(a^3*d) - ((4*I)*e^2*(e*Sec[c + d*x])^(9/2))/(a
*d*(a + I*a*Tan[c + d*x])^2)
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{13/2}}{(a+ia\tan(c+dx))^3}\,dx = -\frac{4ie^2(e\sec(c+dx))^{9/2}}{ad(a+ia\tan(c+dx))^2} + \frac{\left(9e^2\right)\int \frac{(e\sec(c+dx))^{9/2}}{a+ia\tan(c+dx)}\,dx}{a^2}$$
$$= -\frac{18ie^4(e\sec(c+dx))^{5/2}}{5a^3d} - \frac{4ie^2(e\sec(c+dx))^{9/2}}{ad(a+ia\tan(c+dx))^2} + \frac{\left(9e^4\right)\int (e\sec(c+dx))^{5/2}\,dx}{a^3}$$
$$= -\frac{18ie^4(e\sec(c+dx))^{5/2}}{5a^3d} + \frac{6e^5(e\sec(c+dx))^{3/2}\sin(c+dx)}{a^3d} - \frac{4ie^2(e\sec(c+dx)}{ad(a+ia\tan(c+a}$$
$$= -\frac{18ie^4(e\sec(c+dx))^{5/2}}{5a^3d} + \frac{6e^5(e\sec(c+dx))^{3/2}\sin(c+dx)}{a^3d} - \frac{4ie^2(e\sec(c+dx)}{ad(a+ia\tan(c+a}$$
$$= \frac{6e^6\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{a^3d} - \frac{18ie^4(e\sec(c+dx))^{5/2}}{5a^3d} + \frac{6e^5}{}$$

Mathematica [A] time = 0.68, size = 74, normalized size = 0.52

$$\frac{e^4(e\sec(c+dx))^{5/2}\left(-5\sin(2(c+dx))-20i\cos(2(c+dx))+30\cos^{\frac{5}{2}}(c+dx)F\left(\frac{1}{2}(c+dx)\middle|2\right)-18i\right)}{5a^3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(13/2)/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (e^4*(e*Sec[c + d*x])^(5/2)*(-18*I - (20*I)*Cos[2*(c + d*x)] + 30*Cos[c + d
*x]^(5/2)*EllipticF[(c + d*x)/2, 2] - 5*Sin[2*(c + d*x)]))/(5*a^3*d)
```

fricas [F] time = 0.64, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(-30i\,e^6e^{(4i\,dx+4i\,c)}-72i\,e^6e^{(2i\,dx+2i\,c)}-50i\,e^6\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+5\left(a^3de^{(4i\,dx+4i\,c)}+2\,a^3de^{(2i\,dx+2i\,c)}+\right.}{5\left(a^3de^{(4i\,dx+4i\,c)}+2\,a^3de^{(2i\,dx+2i\,c)}+a^3d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(13/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/5*(sqrt(2)*(-30*I*e^6*e^(4*I*d*x + 4*I*c) - 72*I*e^6*e^(2*I*d*x + 2*I*c)
- 50*I*e^6)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 5*(
a^3*d*e^(4*I*d*x + 4*I*c) + 2*a^3*d*e^(2*I*d*x + 2*I*c) + a^3*d)*integral(-
3*I*sqrt(2)*e^6*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/
(a^3*d), x))/(a^3*d*e^(4*I*d*x + 4*I*c) + 2*a^3*d*e^(2*I*d*x + 2*I*c) + a^3
*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{13}{2}}}{(i\,a\tan(dx+c)+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(13/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(13/2)/(I*a*tan(d*x + c) + a)^3, x)
```

maple [A] time = 1.34, size = 213, normalized size = 1.51

$$\frac{2 (1+\cos (dx+c))^2 (-1+\cos (dx+c))^2 \left(15 i \,\mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)}, i\right) \left(\cos^3 (dx+c)\right) \sqrt{\frac{1}{1+\cos(dx+c)}}\, \sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(13/2)/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 2/5/a^3/d*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(15*I*(1/(1+cos(d*x+c)))^(1/2)
*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I
)*cos(d*x+c)^3+15*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)^2-20*I*cos(d*x+c)^
2-5*cos(d*x+c)*sin(d*x+c)+I)*(e/cos(d*x+c))^(13/2)*cos(d*x+c)^4/sin(d*x+c)^
4
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(13/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(\frac{e}{\cos(c+d\,x)}\right)}^{13/2}}{{\left(a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(13/2)/(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] int((e/cos(c + d*x))^(13/2)/(a + a*tan(c + d*x)*1i)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(13/2)/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] Timed out
```

3.247 $\int \frac{(e\sec(c+dx))^{11/2}}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=141

$$\frac{14e^6E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^3d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{14e^5\sin(c+dx)\sqrt{e\sec(c+dx)}}{a^3d}+\frac{14ie^4(e\sec(c+dx))^{3/2}}{3a^3d}+\frac{4ie^2(e\sec(c+dx)}{ad(a+ia\tan(c+}$$

```
[Out] 14/3*I*e^4*(e*sec(d*x+c))^(3/2)/a^3/d+14*e^6*(cos(1/2*d*x+1/2*c)^2)^(1/2)/c
os(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/a^3/d/cos(d*x+c)^(1
/2)/(e*sec(d*x+c))^(1/2)-14*e^5*sin(d*x+c)*(e*sec(d*x+c))^(1/2)/a^3/d+4*I*e
^2*(e*sec(d*x+c))^(7/2)/a/d/(a+I*a*tan(d*x+c))^2
```

Rubi [A] time = 0.15, antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {3500, 3501, 3768, 3771, 2639}

$$\frac{14ie^4(e\sec(c+dx))^{3/2}}{3a^3d}-\frac{14e^5\sin(c+dx)\sqrt{e\sec(c+dx)}}{a^3d}+\frac{14e^6E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^3d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{4ie^2(e\sec(c+dx)}{ad(a+ia\tan(c+}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(11/2)/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (14*e^6*EllipticE[(c + d*x)/2, 2])/(a^3*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c +
 d*x]]) + (((14*I)/3)*e^4*(e*Sec[c + d*x])^(3/2))/(a^3*d) - (14*e^5*Sqrt[e*
Sec[c + d*x]]*Sin[c + d*x])/(a^3*d) + ((4*I)*e^2*(e*Sec[c + d*x])^(7/2))/(a
*d*(a + I*a*Tan[c + d*x])^2)
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
```

```
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\begin{aligned}\int \frac{(e\sec(c+dx))^{11/2}}{(a+ia\tan(c+dx))^3}\,dx &= \frac{4ie^2(e\sec(c+dx))^{7/2}}{ad(a+ia\tan(c+dx))^2} - \frac{\left(7e^2\right)\int \frac{(e\sec(c+dx))^{7/2}}{a+ia\tan(c+dx)}\,dx}{a^2} \\ &= \frac{14ie^4(e\sec(c+dx))^{3/2}}{3a^3d} + \frac{4ie^2(e\sec(c+dx))^{7/2}}{ad(a+ia\tan(c+dx))^2} - \frac{\left(7e^4\right)\int (e\sec(c+dx))^{3/2}\,dx}{a^3} \\ &= \frac{14ie^4(e\sec(c+dx))^{3/2}}{3a^3d} - \frac{14e^5\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{a^3d} + \frac{4ie^2(e\sec(c+dx))^{7/2}}{ad(a+ia\tan(c+dx))^2} \\ &= \frac{14ie^4(e\sec(c+dx))^{3/2}}{3a^3d} - \frac{14e^5\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{a^3d} + \frac{4ie^2(e\sec(c+dx))^{7/2}}{ad(a+ia\tan(c+dx))^2} \\ &= \frac{14e^6E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^3d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} + \frac{14ie^4(e\sec(c+dx))^{3/2}}{3a^3d} - \frac{14e^5\sqrt{e\sec(c+dx)}\,\sin}{a^3d}\end{aligned}$$

Mathematica [C] time = 1.06, size = 93, normalized size = 0.66

$$\frac{ie^4(e\sec(c+dx))^{3/2}\left(-7\left(1+e^{2i(c+dx)}\right)^{3/2}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)+9i\sin(2(c+dx))+33\cos(2(c+dx))+35\right)}{3a^3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(11/2)/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] ((I/3)*e^4*(e*Sec[c + d*x])^(3/2)*(35 + 33*Cos[2*(c + d*x)] - 7*(1 + E^((2*
I)*(c + d*x)))^(3/2)*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x))]
 + (9*I)*Sin[2*(c + d*x)]))/(a^3*d)
```

fricas [F] time = 0.62, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(42ie^5e^{(4idx+4ic)}+70ie^5e^{(2idx+2ic)}+24ie^5\right)\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}\,e^{\left(\frac{1}{2}idx+\frac{1}{2}ic\right)}+3\left(a^3de^{(3idx+3ic)}+a^3de^{(idx+ic)}\right)\text{integral}}{3\left(a^3de^{(3idx+3ic)}+a^3de^{(idx+ic)}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(11/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/3*(sqrt(2)*(42*I*e^5*e^(4*I*d*x + 4*I*c) + 70*I*e^5*e^(2*I*d*x + 2*I*c) +
 24*I*e^5)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 3*(a
^3*d*e^(3*I*d*x + 3*I*c) + a^3*d*e^(I*d*x + I*c))*integral(-7*I*sqrt(2)*e^5
*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(a^3*d), x))/(a^
3*d*e^(3*I*d*x + 3*I*c) + a^3*d*e^(I*d*x + I*c))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{11}{2}}}{(ia\tan(dx+c)+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(11/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(11/2)/(I*a*tan(d*x + c) + a)^3, x)
```

maple [B] time = 1.36, size = 388, normalized size = 2.75

$$-\frac{2\left(\frac{e}{\cos(dx+c)}\right)^{\frac{11}{2}}(-1+\cos(dx+c))^2(1+\cos(dx+c))^2\left(21i\sin(dx+c)\left(\cos^2(dx+c)\right)\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+}{1+\cos(dx}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(11/2)/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] -2/3/a^3/d*(e/cos(d*x+c))^(11/2)*(-1+cos(d*x+c))^2*(1+cos(d*x+c))^2*(21*I*E
llipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)^2*sin(d*x+c)*(1/(1+cos(
d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-21*I*cos(d*x+c)^2*sin(d*x+
c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(
-1+cos(d*x+c))/sin(d*x+c),I)+21*I*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)
*cos(d*x+c)*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2)-21*I*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)*sin(d*x+c)
*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)-12*I*cos(d*x+c)
^2*sin(d*x+c)+12*cos(d*x+c)^3-21*cos(d*x+c)^2-I*sin(d*x+c)+9*cos(d*x+c))*co
s(d*x+c)^4/sin(d*x+c)^5
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(11/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{11/2}}{(a+a\tan(c+d\,x)\,1\mathrm{i})^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(11/2)/(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] int((e/cos(c + d*x))^(11/2)/(a + a*tan(c + d*x)*1i)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(11/2)/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] Timed out
```

3.248 $\int \frac{(e\sec(c+dx))^{9/2}}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=116

$$\frac{10ie^4\sqrt{e\sec(c+dx)}}{3a^3d}-\frac{10e^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3a^3d}+\frac{4ie^2(e\sec(c+dx))^{5/2}}{3ad(a+ia\tan(c+dx))^2}$$

```
[Out] 10/3*I*e^4*(e*sec(d*x+c))^(1/2)/a^3/d-10/3*e^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)
/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*
(e*sec(d*x+c))^(1/2)/a^3/d+4/3*I*e^2*(e*sec(d*x+c))^(5/2)/a/d/(a+I*a*tan(d*
x+c))^2
```

Rubi [A] time = 0.13, antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3500, 3501, 3771, 2641}

$$\frac{10ie^4\sqrt{e\sec(c+dx)}}{3a^3d}-\frac{10e^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3a^3d}+\frac{4ie^2(e\sec(c+dx))^{5/2}}{3ad(a+ia\tan(c+dx))^2}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(9/2)/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (((10*I)/3)*e^4*Sqrt[e*Sec[c + d*x]])/(a^3*d) - (10*e^4*Sqrt[Cos[c + d*x]]*
EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(3*a^3*d) + (((4*I)/3)*e^2*
(e*Sec[c + d*x])^(5/2))/(a*d*(a + I*a*Tan[c + d*x])^2)
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{9/2}}{(a+ia\tan(c+dx))^3}\,dx = \frac{4ie^2(e\sec(c+dx))^{5/2}}{3ad(a+ia\tan(c+dx))^2} - \frac{\left(5e^2\right)\int \frac{(e\sec(c+dx))^{5/2}}{a+ia\tan(c+dx)}\,dx}{3a^2}$$
$$= \frac{10ie^4\sqrt{e\sec(c+dx)}}{3a^3d} + \frac{4ie^2(e\sec(c+dx))^{5/2}}{3ad(a+ia\tan(c+dx))^2} - \frac{\left(5e^4\right)\int \sqrt{e\sec(c+dx)}\,dx}{3a^3}$$
$$= \frac{10ie^4\sqrt{e\sec(c+dx)}}{3a^3d} + \frac{4ie^2(e\sec(c+dx))^{5/2}}{3ad(a+ia\tan(c+dx))^2} - \frac{\left(5e^4\sqrt{\cos(c+dx)}\sqrt{e\sec(c+\right.}{3a^3}$$
$$= \frac{10ie^4\sqrt{e\sec(c+dx)}}{3a^3d} - \frac{10e^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{3a^3d} + \frac{4i}{3ad}$$

Mathematica [A] time = 0.45, size = 125, normalized size = 1.08

$$\frac{2e^4\sec^3(c+dx)\sqrt{e\sec(c+dx)}\,(\sin(2(c+dx))-i\cos(2(c+dx)))\left(3\sin(c+dx)-7i\cos(c+dx)+5\sqrt{\cos(c+\right.}{3a^3d(\tan(c+dx)-i)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(9/2)/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (2*e^4*Sec[c + d*x]^3*Sqrt[e*Sec[c + d*x]]*((-7*I)*Cos[c + d*x] + 5*Sqrt[Co
s[c + d*x]]*EllipticF[(c + d*x)/2, 2]*(Cos[c + d*x] + I*Sin[c + d*x]) + 3*S
in[c + d*x])*((-I)*Cos[2*(c + d*x)] + Sin[2*(c + d*x)]))/(3*a^3*d*(-I + Tan
[c + d*x])^3)
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\frac{\left(3\,a^3de^{(2i\,dx+2i\,c)}\text{integral}\left(\frac{5i\,\sqrt{2}\,e^4\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{3\,a^3d},x\right)+\sqrt{2}\left(10i\,e^4e^{(2i\,dx+2i\,c)}+4i\,e^4\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\right.}}{3\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(9/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/3*(3*a^3*d*e^(2*I*d*x + 2*I*c)*integral(5/3*I*sqrt(2)*e^4*sqrt(e/(e^(2*I*
d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(a^3*d), x) + sqrt(2)*(10*I*e^4
*e^(2*I*d*x + 2*I*c) + 4*I*e^4)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*
d*x + 1/2*I*c))*e^(-2*I*d*x - 2*I*c)/(a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{9}{2}}}{(i\,a\tan(dx+c)+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(9/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(9/2)/(I*a*tan(d*x + c) + a)^3, x)
```

maple [A] time = 1.32, size = 203, normalized size = 1.75

$$2\left(\cos^4(dx+c)\right)\left(\frac{e}{\cos(dx+c)}\right)^{\frac{9}{2}}(-1+\cos(dx+c))^2(1+\cos(dx+c))^2\left(-5i\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \text{EllipticF}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(9/2)/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 2/3/a^3/d*cos(d*x+c)^4*(e/cos(d*x+c))^(9/2)*(-1+cos(d*x+c))^2*(1+cos(d*x+c)
)^2*(-5*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Ellipt
icF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)-5*I*(1/(1+cos(d*x+c)))^(1/2)
*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I
)+4*I*cos(d*x+c)^2+4*cos(d*x+c)*sin(d*x+c)+3*I)/sin(d*x+c)^4
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(9/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{9/2}}{\left(a+a\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(9/2)/(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] int((e/cos(c + d*x))^(9/2)/(a + a*tan(c + d*x)*1i)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(9/2)/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] Timed out
```

3.249 $\int \frac{(e\sec(c+dx))^{7/2}}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=116

$$-\frac{6ie^4}{5a^3d\sqrt{e\sec(c+dx)}}-\frac{6e^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^3d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{4ie^2(e\sec(c+dx))^{3/2}}{5ad(a+ia\tan(c+dx))^2}$$

```
[Out] -6/5*I*e^4/a^3/d/(e*sec(d*x+c))^(1/2)-6/5*e^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/
cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/a^3/d/cos(d*x+c)^(
1/2)/(e*sec(d*x+c))^(1/2)+4/5*I*e^2*(e*sec(d*x+c))^(3/2)/a/d/(a+I*a*tan(d*x
+c))^2
```

Rubi [A] time = 0.13, antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3500, 3501, 3771, 2639}

$$-\frac{6ie^4}{5a^3d\sqrt{e\sec(c+dx)}}-\frac{6e^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^3d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{4ie^2(e\sec(c+dx))^{3/2}}{5ad(a+ia\tan(c+dx))^2}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(7/2)/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (((-6*I)/5)*e^4)/(a^3*d*Sqrt[e*Sec[c + d*x]]) - (6*e^4*EllipticE[(c + d*x)/
2, 2])/(5*a^3*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c + d*x]]) + (((4*I)/5)*e^2*(
e*Sec[c + d*x])^(3/2))/(a*d*(a + I*a*Tan[c + d*x])^2)
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{7/2}}{(a+ia\tan(c+dx))^3}\,dx = \frac{4ie^2(e\sec(c+dx))^{3/2}}{5ad(a+ia\tan(c+dx))^2} - \frac{(3e^2)\int \frac{(e\sec(c+dx))^{3/2}}{a+ia\tan(c+dx)}\,dx}{5a^2}$$

$$= -\frac{6ie^4}{5a^3d\sqrt{e\sec(c+dx)}} + \frac{4ie^2(e\sec(c+dx))^{3/2}}{5ad(a+ia\tan(c+dx))^2} - \frac{(3e^4)\int \frac{1}{\sqrt{e\sec(c+dx)}}\,dx}{5a^3}$$

$$= -\frac{6ie^4}{5a^3d\sqrt{e\sec(c+dx)}} + \frac{4ie^2(e\sec(c+dx))^{3/2}}{5ad(a+ia\tan(c+dx))^2} - \frac{(3e^4)\int \sqrt{\cos(c+dx)}\,dx}{5a^3\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}$$

$$= -\frac{6ie^4}{5a^3d\sqrt{e\sec(c+dx)}} - \frac{6e^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^3d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} + \frac{4ie^2(e\sec(c+dx))^{3/2}}{5ad(a+ia\tan(c+dx))^2}$$

Mathematica [C] time = 0.65, size = 117, normalized size = 1.01

$$\frac{2ee^{-idx}\left(-2+\frac{6e^{2i(c+dx)}\,{}_2F_1\left(-\frac{1}{4},\frac{1}{2};\frac{3}{4};-e^{2i(c+dx)}\right)}{\sqrt{1+e^{2i(c+dx)}}}\right)(e\sec(c+dx))^{5/2}(\cos(c+2dx)+i\sin(c+2dx))}{5a^3d(\tan(c+dx)-i)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(7/2)/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (2*e*(-2 + (6*E^((2*I)*(c + d*x))*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*
I)*(c + d*x))])/Sqrt[1 + E^((2*I)*(c + d*x))])*(e*Sec[c + d*x])^(5/2)*(Cos[
c + 2*d*x] + I*Sin[c + 2*d*x]))/(5*a^3*d*E^(I*d*x)*(-I + Tan[c + d*x])^3)
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\frac{\left(5\,a^3de^{(3i\,dx+3i\,c)}\mathrm{integral}\left(\frac{3i\,\sqrt{2}\,e^3\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}}{5\,a^3d},x\right)+\sqrt{2}\left(-6i\,e^3e^{(4i\,dx+4i\,c)}-4i\,e^3e^{(2i\,dx+2i\,c)}+2i\,e^3\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}}}\right.}{5\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/5*(5*a^3*d*e^(3*I*d*x + 3*I*c)*integral(3/5*I*sqrt(2)*e^3*sqrt(e/(e^(2*I*
d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(a^3*d), x) + sqrt(2)*(-6*I*e^3*
e^(4*I*d*x + 4*I*c) - 4*I*e^3*e^(2*I*d*x + 2*I*c) + 2*I*e^3)*sqrt(e/(e^(2*I
*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))*e^(-3*I*d*x - 3*I*c)/(a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{7}{2}}}{(i\,a\tan(dx+c)+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(7/2)/(I*a*tan(d*x + c) + a)^3, x)
```

maple [B] time = 1.32, size = 378, normalized size = 3.26

$$-\frac{2\left(-3i\cos(dx+c)\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \mathrm{EllipticE}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)\sin(dx+c)+3i\cos(dx+c)\sqrt{\frac{1}{1+\cos(d}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] -2/5/a^3/d*(-3*I*sin(d*x+c)*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)+3*I*sin(d*
x+c)*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*
EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-4*I*cos(d*x+c)^3*sin(d*x+c)-3*I*s
in(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Ellipt
icE(I*(-1+cos(d*x+c))/sin(d*x+c),I)+3*I*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)
*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I
)+4*cos(d*x+c)^4+5*I*cos(d*x+c)*sin(d*x+c)-7*cos(d*x+c)^2+3*cos(d*x+c))*(1+
cos(d*x+c))^2*(-1+cos(d*x+c))^2*(e/cos(d*x+c))^(7/2)*cos(d*x+c)^3/sin(d*x+c
)^5
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{7/2}}{\left(a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(7/2)/(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] int((e/cos(c + d*x))^(7/2)/(a + a*tan(c + d*x)*1i)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(7/2)/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] Timed out
```

3.250 $\int \frac{(e\sec(c+dx))^{5/2}}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=132

$$-\frac{2ie^2\sqrt{e\sec(c+dx)}}{21d\left(a^3+ia^3\tan(c+dx)\right)}-\frac{2e^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{21a^3d}+\frac{4ie^2\sqrt{e\sec(c+dx)}}{7ad(a+ia\tan(c+dx))^2}$$

```
[Out] -2/21*e^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2
*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(d*x+c))^(1/2)/a^3/d+4/7*I*e^2*
(e*sec(d*x+c))^(1/2)/a/d/(a+I*a*tan(d*x+c))^2-2/21*I*e^2*(e*sec(d*x+c))^(1/
2)/d/(a^3+I*a^3*tan(d*x+c))
```

Rubi [A] time = 0.13, antiderivative size = 132, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3500, 3502, 3771, 2641}

$$-\frac{2ie^2\sqrt{e\sec(c+dx)}}{21d\left(a^3+ia^3\tan(c+dx)\right)}-\frac{2e^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{21a^3d}+\frac{4ie^2\sqrt{e\sec(c+dx)}}{7ad(a+ia\tan(c+dx))^2}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(5/2)/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (-2*e^2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/
(21*a^3*d) + (((4*I)/7)*e^2*Sqrt[e*Sec[c + d*x]])/(a*d*(a + I*a*Tan[c + d*x
])^2) - (((2*I)/21)*e^2*Sqrt[e*Sec[c + d*x]])/(d*(a^3 + I*a^3*Tan[c + d*x])
)
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{5/2}}{(a+ia\tan(c+dx))^3}\,dx = \frac{4ie^2\sqrt{e\sec(c+dx)}}{7ad(a+ia\tan(c+dx))^2} - \frac{e^2\int \frac{\sqrt{e\sec(c+dx)}}{a+ia\tan(c+dx)}\,dx}{7a^2}$$

$$= \frac{4ie^2\sqrt{e\sec(c+dx)}}{7ad(a+ia\tan(c+dx))^2} - \frac{2ie^2\sqrt{e\sec(c+dx)}}{21d\left(a^3+ia^3\tan(c+dx)\right)} - \frac{e^2\int\sqrt{e\sec(c+dx)}\,dx}{21a^3}$$

$$= \frac{4ie^2\sqrt{e\sec(c+dx)}}{7ad(a+ia\tan(c+dx))^2} - \frac{2ie^2\sqrt{e\sec(c+dx)}}{21d\left(a^3+ia^3\tan(c+dx)\right)} - \frac{\left(e^2\sqrt{\cos(c+dx)}\sqrt{e\sec\ldots\right.}{21\ldots}$$

$$= -\frac{2e^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{21a^3d} + \frac{4ie^2\sqrt{e\sec(c+dx)}}{7ad(a+ia\tan(c+dx))^2} - \ldots$$

Mathematica [A] time = 0.64, size = 104, normalized size = 0.79

$$\frac{(e\sec(c+dx))^{5/2}\left(-\sin(2(c+dx)) - 5i\cos(2(c+dx)) + 2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)(\cos(2(c+dx)) + i\sin\ldots\right.}{21a^3d(\tan(c+dx)-i)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(5/2)/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] ((e*Sec[c + d*x])^(5/2)*(-5*I - (5*I)*Cos[2*(c + d*x)] + 2*Sqrt[Cos[c + d*x
]]*EllipticF[(c + d*x)/2, 2]*(Cos[2*(c + d*x)] + I*Sin[2*(c + d*x)]) - Sin[
2*(c + d*x)]))/(21*a^3*d*(-I + Tan[c + d*x])^2)
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\frac{\left(21\,a^3de^{(4i\,dx+4i\,c)}\mathrm{integral}\left(\frac{i\sqrt{2}e^2\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{21\,a^3d}, x\right) + \sqrt{2}\left(2i\,e^2e^{(4i\,dx+4i\,c)} + 5i\,e^2e^{(2i\,dx+2i\,c)} + 3i\,e^2\right)\sqrt{\frac{e}{e^{(2i\,d\ldots}}}\right.}{21\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/21*(21*a^3*d*e^(4*I*d*x + 4*I*c)*integral(1/21*I*sqrt(2)*e^2*sqrt(e/(e^(2
*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(a^3*d), x) + sqrt(2)*(2*I*e
^2*e^(4*I*d*x + 4*I*c) + 5*I*e^2*e^(2*I*d*x + 2*I*c) + 3*I*e^2)*sqrt(e/(e^(
2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))*e^(-4*I*d*x - 4*I*c)/(a^3*d
)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{5}{2}}}{(i\,a\tan(dx+c)+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(5/2)/(I*a*tan(d*x + c) + a)^3, x)
```

maple [A] time = 1.28, size = 227, normalized size = 1.72

$$-\frac{2\left(\frac{e}{\cos(dx+c)}\right)^{\frac{5}{2}}\left(-1+\cos\left(dx+c\right)\right)^{2}\left(1+\cos\left(dx+c\right)\right)^{2}\left(\cos^{2}\left(dx+c\right)\right)\left(i\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \mathrm{EllipticF}\left(\frac{i(-1}{\mathrm{s}}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] -2/21/a^3/d*(e/cos(d*x+c))^(5/2)*(-1+cos(d*x+c))^2*(1+cos(d*x+c))^2*cos(d*x
+c)^2*(I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Ellipti
cF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)-12*I*cos(d*x+c)^4+I*(1/(1+cos
(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c
))/sin(d*x+c),I)-12*cos(d*x+c)^3*sin(d*x+c)+7*I*cos(d*x+c)^2+cos(d*x+c)*sin
(d*x+c))/sin(d*x+c)^4
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{5/2}}{{\left(a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(5/2)/(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] int((e/cos(c + d*x))^(5/2)/(a + a*tan(c + d*x)*1i)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{i\int \frac{\left(e\sec\left(c+dx\right)\right)^{\frac{5}{2}}}{\tan^{3}\left(c+dx\right)-3i\tan^{2}\left(c+dx\right)-3\tan\left(c+dx\right)+i}\, dx}{a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(5/2)/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] I*Integral((e*sec(c + d*x))**(5/2)/(tan(c + d*x)**3 - 3*I*tan(c + d*x)**2 -
 3*tan(c + d*x) + I), x)/a**3
```

3.251 $\int \frac{(e\sec(c+dx))^{3/2}}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=132

$$\frac{2ie^2}{45d\left(a^3+ia^3\tan(c+dx)\right)\sqrt{e\sec(c+dx)}}+\frac{2e^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15a^3d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{4ie^2}{9ad(a+ia\tan(c+dx))^2\sqrt{e\sec(c+dx)}}$$

```
[Out] 2/15*e^2*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*
d*x+1/2*c),2^(1/2))/a^3/d/cos(d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)+4/9*I*e^2/a
/d/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^2+2/45*I*e^2/d/(e*sec(d*x+c))^(1
/2)/(a^3+I*a^3*tan(d*x+c))
```

Rubi [A] time = 0.13, antiderivative size = 132, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3500, 3502, 3771, 2639}

$$\frac{2ie^2}{45d\left(a^3+ia^3\tan(c+dx)\right)\sqrt{e\sec(c+dx)}}+\frac{2e^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15a^3d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{4ie^2}{9ad(a+ia\tan(c+dx))^2\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(3/2)/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (2*e^2*EllipticE[(c + d*x)/2, 2])/(15*a^3*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c
 + d*x]]) + (((4*I)/9)*e^2)/(a*d*Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x]
)^2) + (((2*I)/45)*e^2)/(d*Sqrt[e*Sec[c + d*x]]*(a^3 + I*a^3*Tan[c + d*x]))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{3/2}}{(a+ia\tan(c+dx))^3}\,dx = \frac{4ie^2}{9ad\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^2} + \frac{e^2\int \frac{1}{\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))}\,dx}{9a^2}$$

$$= \frac{4ie^2}{9ad\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^2} + \frac{2ie^2}{45d\sqrt{e\sec(c+dx)}\,\left(a^3+ia^3\tan(c+dx)\right)}$$

$$= \frac{4ie^2}{9ad\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^2} + \frac{2ie^2}{45d\sqrt{e\sec(c+dx)}\,\left(a^3+ia^3\tan(c+dx)\right)}$$

$$= \frac{2e^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15a^3d\sqrt{\cos(c+dx)}\,\sqrt{e\sec(c+dx)}} + \frac{4ie^2}{9ad\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^2} + \frac{}{45}$$

Mathematica [C] time = 0.85, size = 140, normalized size = 1.06

$$-\frac{e^{-idx}\sec^2(c+dx)(\cos(dx)+i\sin(dx))(e\sec(c+dx))^{3/2}\left(6e^{2i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\,{}_2F_1\left(-\frac{1}{4},\frac{1}{2};\frac{3}{4};-e^{2i(c+dx)}\right)+3i\sin\right.}{45a^3d(\tan(c+dx)-i)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(3/2)/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] -1/45*(Sec[c + d*x]^2*(e*Sec[c + d*x])^(3/2)*(Cos[d*x] + I*Sin[d*x])*(8 + 8
*Cos[2*(c + d*x)] + 6*E^((2*I)*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hyp
ergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*x))] + (3*I)*Sin[2*(c + d*x
)]))/(a^3*d*E^(I*d*x)*(-I + Tan[c + d*x])^3)
```

fricas [F] time = 0.84, size = 0, normalized size = 0.00

$$\frac{\left(90\,a^3de^{(5i\,dx+5i\,c)}\text{integral}\left(-\frac{i\sqrt{2}\,e\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}}{15\,a^3d},x\right)+\sqrt{2}\left(12i\,ee^{(6i\,dx+6i\,c)}+23i\,ee^{(4i\,dx+4i\,c)}+16i\,ee^{(2i\,dx+2i\,c)}\right.\right.}{90\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/90*(90*a^3*d*e^(5*I*d*x + 5*I*c)*integral(-1/15*I*sqrt(2)*e*sqrt(e/(e^(2*
I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(a^3*d), x) + sqrt(2)*(12*I*e*
e^(6*I*d*x + 6*I*c) + 23*I*e*e^(4*I*d*x + 4*I*c) + 16*I*e*e^(2*I*d*x + 2*I*
c) + 5*I*e)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))*e^(-
5*I*d*x - 5*I*c)/(a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{3}{2}}}{(i\,a\tan(dx+c)+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(3/2)/(I*a*tan(d*x + c) + a)^3, x)
```

maple [B] time = 1.34, size = 388, normalized size = 2.94

$$2\left(20i\left(\cos^5(dx+c)\right)\sin(dx+c)+3i\cos(dx+c)\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)},i\right)\sin(\ldots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 2/45/a^3/d*(20*I*cos(d*x+c)^5*sin(d*x+c)+3*I*sin(d*x+c)*cos(d*x+c)*(1/(1+co
s(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+
c))/sin(d*x+c),I)-3*I*sin(d*x+c)*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d
*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)-20*co
s(d*x+c)^6+3*I*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-3*I*sin(d*x+c)*(1/(1+co
s(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+
c))/sin(d*x+c),I)-9*I*cos(d*x+c)^3*sin(d*x+c)+19*cos(d*x+c)^4-2*cos(d*x+c)^
2+3*cos(d*x+c))*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(e/cos(d*x+c))^(3/2)*cos
(d*x+c)/sin(d*x+c)^5
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{3/2}}{(a+a\tan(c+d\,x)\,1\mathrm{i})^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(3/2)/(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] int((e/cos(c + d*x))^(3/2)/(a + a*tan(c + d*x)*1i)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{i\int\frac{(e\sec(c+dx))^{\frac{3}{2}}}{\tan^3(c+dx)-3i\tan^2(c+dx)-3\tan(c+dx)+i}\,dx}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(3/2)/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] I*Integral((e*sec(c + d*x))**(3/2)/(tan(c + d*x)**3 - 3*I*tan(c + d*x)**2 -
 3*tan(c + d*x) + I), x)/a**3
```

3.252 $\int \frac{\sqrt{e \sec(c+dx)}}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=152

$$\frac{20ie^2}{77d\left(a^3+ia^3\tan(c+dx)\right)(e\sec(c+dx))^{3/2}}+\frac{10e\sin(c+dx)}{77a^3d\sqrt{e\sec(c+dx)}}+\frac{10\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{77a^3d}$$

```
[Out] 10/77*e*sin(d*x+c)/a^3/d/(e*sec(d*x+c))^(1/2)+10/77*(cos(1/2*d*x+1/2*c)^2)^
(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(
1/2)*(e*sec(d*x+c))^(1/2)/a^3/d+2/11*I*(e*sec(d*x+c))^(1/2)/d/(a+I*a*tan(d*
x+c))^3+20/77*I*e^2/d/(e*sec(d*x+c))^(3/2)/(a^3+I*a^3*tan(d*x+c))
```

Rubi [A] time = 0.14, antiderivative size = 152, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {3502, 3500, 3769, 3771, 2641}

$$\frac{20ie^2}{77d\left(a^3+ia^3\tan(c+dx)\right)(e\sec(c+dx))^{3/2}}+\frac{10e\sin(c+dx)}{77a^3d\sqrt{e\sec(c+dx)}}+\frac{10\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{77a^3d}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Sec[c + d*x]]/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (10*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(77*
a^3*d) + (10*e*Sin[c + d*x])/(77*a^3*d*Sqrt[e*Sec[c + d*x]]) + (((2*I)/11)*
Sqrt[e*Sec[c + d*x]])/(d*(a + I*a*Tan[c + d*x])^3) + (((20*I)/77)*e^2)/(d*(
e*Sec[c + d*x])^(3/2)*(a^3 + I*a^3*Tan[c + d*x]))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
```

]

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{\sqrt{e\sec(c+dx)}}{(a+ia\tan(c+dx))^3}\,dx = \frac{2i\sqrt{e\sec(c+dx)}}{11d(a+ia\tan(c+dx))^3} + \frac{5\int \frac{\sqrt{e\sec(c+dx)}}{(a+ia\tan(c+dx))^2}\,dx}{11a}$$

$$= \frac{2i\sqrt{e\sec(c+dx)}}{11d(a+ia\tan(c+dx))^3} + \frac{20ie^2}{77d(e\sec(c+dx))^{3/2}\left(a^3+ia^3\tan(c+dx)\right)} + \frac{\left(15e^2\right)}{}$$

$$= \frac{10e\sin(c+dx)}{77a^3d\sqrt{e\sec(c+dx)}} + \frac{2i\sqrt{e\sec(c+dx)}}{11d(a+ia\tan(c+dx))^3} + \frac{20ie^2}{77d(e\sec(c+dx))^{3/2}\left(a^3+ia\right.}$$

$$= \frac{10e\sin(c+dx)}{77a^3d\sqrt{e\sec(c+dx)}} + \frac{2i\sqrt{e\sec(c+dx)}}{11d(a+ia\tan(c+dx))^3} + \frac{20ie^2}{77d(e\sec(c+dx))^{3/2}\left(a^3+ia\right.}$$

$$= \frac{10\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{77a^3d} + \frac{10e\sin(c+dx)}{77a^3d\sqrt{e\sec(c+dx)}} + \frac{2}{11d(a}$$

Mathematica [A] time = 0.52, size = 129, normalized size = 0.85

$$\frac{i\sec^3(c+dx)\sqrt{e\sec(c+dx)}\left(-15\sin(c+dx)-15\sin(3(c+dx))+46i\cos(c+dx)+22i\cos(3(c+dx))+20\right.}{154a^3d(\tan(c+dx)-i)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Sec[c + d*x]]/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] ((I/154)*Sec[c + d*x]^3*Sqrt[e*Sec[c + d*x]]*((46*I)*Cos[c + d*x] + (22*I)*
Cos[3*(c + d*x)] - 15*Sin[c + d*x] + 20*Sqrt[Cos[c + d*x]]*EllipticF[(c + d
*x)/2, 2]*(Cos[3*(c + d*x)] + I*Sin[3*(c + d*x)]) - 15*Sin[3*(c + d*x)]))/(
a^3*d*(-I + Tan[c + d*x])^3)
```

fricas [F] time = 0.72, size = 0, normalized size = 0.00

$$\frac{\left(308\,a^3de^{(6i\,dx+6i\,c)}\text{integral}\left(-\frac{5i\,\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{77\,a^3d},x\right)+\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(37i\,e^{(6i\,dx+6i\,c)}+61i\,e^{(4i\,dx+4i\,c)}\right.\right.}{308\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/308*(308*a^3*d*e^(6*I*d*x + 6*I*c)*integral(-5/77*I*sqrt(2)*sqrt(e/(e^(2*
I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(a^3*d), x) + sqrt(2)*sqrt(e/
(e^(2*I*d*x + 2*I*c) + 1))*(37*I*e^(6*I*d*x + 6*I*c) + 61*I*e^(4*I*d*x + 4*
I*c) + 31*I*e^(2*I*d*x + 2*I*c) + 7*I)*e^(1/2*I*d*x + 1/2*I*c))*e^(-6*I*d*x
 - 6*I*c)/(a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e \sec (dx + c)}}{(i\, a \tan (dx + c) + a)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*sec(d*x + c))/(I*a*tan(d*x + c) + a)^3, x)
```

maple [A] time = 1.45, size = 236, normalized size = 1.55

$$\frac{2\sqrt{\frac{e}{\cos(dx+c)}}\, (-1 + \cos (dx + c))^2\, (1 + \cos (dx + c))^2 \left(28i \left(\cos^6 (dx + c)\right) + 28 \left(\cos^5 (dx + c)\right) \sin (dx + c) - 11i \left(c\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 2/77/a^3/d*(e/cos(d*x+c))^(1/2)*(-1+cos(d*x+c))^2*(1+cos(d*x+c))^2*(28*I*co
s(d*x+c)^6+28*cos(d*x+c)^5*sin(d*x+c)-11*I*cos(d*x+c)^4+5*I*(1/(1+cos(d*x+c
)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin
(d*x+c),I)*cos(d*x+c)+5*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)+3*cos(d*x+c)^3*sin(d*x+
c)+5*cos(d*x+c)*sin(d*x+c))/sin(d*x+c)^4
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{\frac{e}{\cos(c+d\,x)}}}{(a + a \tan (c + d\,x)\, 1\mathrm{i})^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(1/2)/(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] int((e/cos(c + d*x))^(1/2)/(a + a*tan(c + d*x)*1i)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{i \int \frac{\sqrt{e \sec (c+dx)}}{\tan^3 (c+dx) - 3i \tan^2 (c+dx) - 3 \tan (c+dx) + i}\, dx}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(1/2)/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] I*Integral(sqrt(e*sec(c + d*x))/(tan(c + d*x)**3 - 3*I*tan(c + d*x)**2 - 3*
tan(c + d*x) + I), x)/a**3
```

3.253 $\int \frac{1}{\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=152

$$\frac{28ie^2}{117d\left(a^3+ia^3\tan(c+dx)\right)(e\sec(c+dx))^{5/2}}+\frac{14e\sin(c+dx)}{117a^3d(e\sec(c+dx))^{3/2}}+\frac{14E\left(\frac{1}{2}(c+dx)\middle|2\right)}{39a^3d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+$$

```
[Out] 14/117*e*sin(d*x+c)/a^3/d/(e*sec(d*x+c))^(3/2)+14/39*(cos(1/2*d*x+1/2*c)^2)
^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/a^3/d/cos(d
*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)+2/13*I/d/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d
*x+c))^3+28/117*I*e^2/d/(e*sec(d*x+c))^(5/2)/(a^3+I*a^3*tan(d*x+c))
```

Rubi [A] time = 0.14, antiderivative size = 152, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {3502, 3500, 3769, 3771, 2639}

$$\frac{28ie^2}{117d\left(a^3+ia^3\tan(c+dx)\right)(e\sec(c+dx))^{5/2}}+\frac{14e\sin(c+dx)}{117a^3d(e\sec(c+dx))^{3/2}}+\frac{14E\left(\frac{1}{2}(c+dx)\middle|2\right)}{39a^3d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^3),x]
```

```
[Out] (14*EllipticE[(c + d*x)/2, 2])/(39*a^3*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c +
d*x]]) + (14*e*Sin[c + d*x])/(117*a^3*d*(e*Sec[c + d*x])^(3/2)) + ((2*I)/13
)/(d*Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^3) + (((28*I)/117)*e^2)/(d
*(e*Sec[c + d*x])^(5/2)*(a^3 + I*a^3*Tan[c + d*x]))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
```

```
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{1}{\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^3}\,dx = \frac{2i}{13d\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^3} + \frac{7\int \frac{1}{\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx}}{13a}$$

$$= \frac{2i}{13d\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^3} + \frac{28ie^2}{117d(e\sec(c+dx))^{5/2}\left(a^3\right.}$$

$$= \frac{14e\sin(c+dx)}{117a^3d(e\sec(c+dx))^{3/2}} + \frac{2i}{13d\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^3} +$$

$$= \frac{14e\sin(c+dx)}{117a^3d(e\sec(c+dx))^{3/2}} + \frac{2i}{13d\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^3} +$$

$$= \frac{14E\left(\frac{1}{2}(c+dx)\middle|2\right)}{39a^3d\sqrt{\cos(c+dx)}\,\sqrt{e\sec(c+dx)}} + \frac{14e\sin(c+dx)}{117a^3d(e\sec(c+dx))^{3/2}} + \frac{}{13a}$$

Mathematica [C] time = 1.45, size = 145, normalized size = 0.95

$$\frac{\sqrt{e\sec(c+dx)}\,(\sin(3(c+dx))+i\cos(3(c+dx)))\left(-56e^{4i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)+126i\sin(2(c\right.}{468a^3de}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^3),x]
```

```
[Out] (Sqrt[e*Sec[c + d*x]]*(I*Cos[3*(c + d*x)] + Sin[3*(c + d*x)])*(62 + 176*Cos
[2*(c + d*x)] + 114*Cos[4*(c + d*x)] - 56*E^((4*I)*(c + d*x))*Sqrt[1 + E^((
2*I)*(c + d*x))]*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x))] + (
126*I)*Sin[2*(c + d*x)] + (105*I)*Sin[4*(c + d*x)]))/(468*a^3*d*e)
```

fricas [F] time = 0.82, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(-117i\,e^{(9i\,dx+9i\,c)}-219i\,e^{(8i\,dx+8i\,c)}-34i\,e^{(7i\,dx+7i\,c)}-302i\,e^{(6i\,dx+6i\,c)}+124i\,e^{(5i\,dx+5i\,c)}-124i\,e^{(4i\,dx+}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas"
)
```

```
[Out] 1/936*(sqrt(2)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(-117*I*e^(9*I*d*x + 9*I*c
) - 219*I*e^(8*I*d*x + 8*I*c) - 34*I*e^(7*I*d*x + 7*I*c) - 302*I*e^(6*I*d*x
 + 6*I*c) + 124*I*e^(5*I*d*x + 5*I*c) - 124*I*e^(4*I*d*x + 4*I*c) + 50*I*e^
(3*I*d*x + 3*I*c) - 50*I*e^(2*I*d*x + 2*I*c) + 9*I*e^(I*d*x + I*c) - 9*I)*e
```

```
^(1/2*I*d*x + 1/2*I*c) + 936*(a^3*d*e*e^(8*I*d*x + 8*I*c) - a^3*d*e*e^(7*I*
d*x + 7*I*c))*integral(1/39*sqrt(2)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(-7*I
*e^(2*I*d*x + 2*I*c) - 14*I*e^(I*d*x + I*c) - 7*I)*e^(1/2*I*d*x + 1/2*I*c)/
(a^3*d*e*e^(3*I*d*x + 3*I*c) - 2*a^3*d*e*e^(2*I*d*x + 2*I*c) + a^3*d*e*e^(I
*d*x + I*c)), x))/(a^3*d*e*e^(8*I*d*x + 8*I*c) - a^3*d*e*e^(7*I*d*x + 7*I*c
))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{e \sec (dx + c)} (i a \tan (dx + c) + a)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate(1/(sqrt(e*sec(d*x + c))*(I*a*tan(d*x + c) + a)^3), x)
```

maple [B] time = 1.72, size = 395, normalized size = 2.60

$$\frac{2 \left(36 i \left(\cos^7 (dx + c)\right) \sin (dx + c) - 36 \left(\cos^8 (dx + c)\right) - 13 i \left(\cos^5 (dx + c)\right) \sin (dx + c) + 21 i \cos (dx + c) \sqrt{\frac{}{1+}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 2/117/a^3/d*(36*I*cos(d*x+c)^7*sin(d*x+c)-36*cos(d*x+c)^8-13*I*cos(d*x+c)^5
*sin(d*x+c)+21*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*sin(d*x+c)*cos(d*x+c)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-21*I*Ellip
ticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)*cos(d*x+c)*sin(d*x+c)+31*cos(d*x+c)^6+21*I*(1/(1+cos(d
*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)*EllipticF(I*(-1+
cos(d*x+c))/sin(d*x+c),I)-21*I*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*(1
/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)-2*cos(d
*x+c)^4-14*cos(d*x+c)^2+21*cos(d*x+c))*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(
e/cos(d*x+c))^(1/2)/sin(d*x+c)^5/e
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\sqrt{\frac{e}{\cos (c+d\,x)}} \, (a + a \tan (c + d\,x) \, 1i)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^3),x)
```

```
[Out] int(1/((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{i\int\frac{1}{\sqrt{e\sec\left(c+dx\right)}\tan^{3}\left(c+dx\right)-3i\sqrt{e\sec\left(c+dx\right)}\tan^{2}\left(c+dx\right)-3\sqrt{e\sec\left(c+dx\right)}\tan\left(c+dx\right)+i\sqrt{e\sec\left(c+dx\right)}}\,dx}{a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))**(1/2)/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] I*Integral(1/(sqrt(e*sec(c + d*x))*tan(c + d*x)**3 - 3*I*sqrt(e*sec(c + d*x
))*tan(c + d*x)**2 - 3*sqrt(e*sec(c + d*x))*tan(c + d*x) + I*sqrt(e*sec(c +
 d*x))), x)/a**3
```

3.254 $\int \frac{1}{(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=186

$$\frac{12ie^2}{55d\left(a^3+ia^3\tan(c+dx)\right)(e\sec(c+dx))^{7/2}}+\frac{2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{11a^3de^2}+\frac{6e\sin(c+d}{55a^3d(e\sec(c+}$$

```
[Out] 6/55*e*sin(d*x+c)/a^3/d/(e*sec(d*x+c))^(5/2)+2/11*sin(d*x+c)/a^3/d/e/(e*sec
(d*x+c))^(1/2)+2/11*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipti
cF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(d*x+c))^(1/2)/a^3/d/
e^2+2/15*I/d/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^3+12/55*I*e^2/d/(e*sec
(d*x+c))^(7/2)/(a^3+I*a^3*tan(d*x+c))
```

Rubi [A] time = 0.18, antiderivative size = 186, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {3502, 3500, 3769, 3771, 2641}

$$\frac{12ie^2}{55d\left(a^3+ia^3\tan(c+dx)\right)(e\sec(c+dx))^{7/2}}+\frac{2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{11a^3de^2}+\frac{6e\sin(c+d}{55a^3d(e\sec(c+}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^3),x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(11*a
^3*d*e^2) + (6*e*Sin[c + d*x])/(55*a^3*d*(e*Sec[c + d*x])^(5/2)) + (2*Sin[c
 + d*x])/(11*a^3*d*e*Sqrt[e*Sec[c + d*x]]) + ((2*I)/15)/(d*(e*Sec[c + d*x])
^(3/2)*(a + I*a*Tan[c + d*x])^3) + (((12*I)/55)*e^2)/(d*(e*Sec[c + d*x])^(7
/2)*(a^3 + I*a^3*Tan[c + d*x]))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
```

```
d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{1}{(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^3}\,dx = \frac{2i}{15d(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^3} + \frac{3\int \frac{1}{(e\sec(c+dx))^{3/2}(a+ia\tan}}{5a}$$

$$= \frac{2i}{15d(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^3} + \frac{12i}{55d(e\sec(c+dx))^{7/2}(}$$

$$= \frac{6e\sin(c+dx)}{55a^3d(e\sec(c+dx))^{5/2}} + \frac{2i}{15d(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))}$$

$$= \frac{6e\sin(c+dx)}{55a^3d(e\sec(c+dx))^{5/2}} + \frac{2\sin(c+dx)}{11a^3de\sqrt{e\sec(c+dx)}} + \frac{}{15d(e\sec(c+d}$$

$$= \frac{6e\sin(c+dx)}{55a^3d(e\sec(c+dx))^{5/2}} + \frac{2\sin(c+dx)}{11a^3de\sqrt{e\sec(c+dx)}} + \frac{}{15d(e\sec(c+d}$$

$$= \frac{2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{11a^3de^2} + \frac{6e\sin(c+d}{55a^3d(e\sec(c+}$$

Mathematica [A] time = 0.73, size = 151, normalized size = 0.81

$$\frac{\sec^5(c+dx)\left(-114i\sin(c+dx)-81i\sin(3(c+dx))+33i\sin(5(c+dx))-332\cos(c+dx)-154\cos(3(c+dx))+\right.}{1320a^3d(\tan(c+dx)-i)^3(e\sec(}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^3),x]
```

```
[Out] (Sec[c + d*x]^5*(-332*Cos[c + d*x] - 154*Cos[3*(c + d*x)] + 22*Cos[5*(c + d
*x)] - (114*I)*Sin[c + d*x] + (240*I)*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x
)/2, 2]*(Cos[3*(c + d*x)] + I*Sin[3*(c + d*x)]) - (81*I)*Sin[3*(c + d*x)] +
 (33*I)*Sin[5*(c + d*x)]))/(1320*a^3*d*(e*Sec[c + d*x])^(3/2)*(-I + Tan[c +
 d*x])^3)
```

fricas [F] time = 0.64, size = 0, normalized size = 0.00

$$\frac{\left(2640\,a^3de^2e^{(8i\,dx+8i\,c)}\text{integral}\left(-\frac{i\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{11\,a^3de^2},x\right)+\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(-55i\,e^{(10i\,dx+10i\,c)}+235i\,e^{(8i\,dx+}\right.\right.}{2640\,a^3de^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas"
)
```

```
[Out] 1/2640*(2640*a^3*d*e^2*e^(8*I*d*x + 8*I*c)*integral(-1/11*I*sqrt(2)*sqrt(e/
(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(a^3*d*e^2), x) + sqrt(
2)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(-55*I*e^(10*I*d*x + 10*I*c) + 235*I*e
^(8*I*d*x + 8*I*c) + 446*I*e^(6*I*d*x + 6*I*c) + 218*I*e^(4*I*d*x + 4*I*c)
+ 73*I*e^(2*I*d*x + 2*I*c) + 11*I)*e^(1/2*I*d*x + 1/2*I*c))*e^(-8*I*d*x - 8
*I*c)/(a^3*d*e^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\sec(dx+c))^{\frac{3}{2}}(i\,a\tan(dx+c)+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate(1/((e*sec(d*x + c))^(3/2)*(I*a*tan(d*x + c) + a)^3), x)
```

maple [A] time = 1.60, size = 261, normalized size = 1.40

$$2\cos(dx+c)\left(\frac{e}{\cos(dx+c)}\right)^{\frac{3}{2}}(-1+\cos(dx+c))^2(1+\cos(dx+c))^2\left(44i\left(\cos^8(dx+c)\right)+44\sin(dx+c)\left(\cos^7(\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] 2/165/a^3/d*cos(d*x+c)*(e/cos(d*x+c))^(3/2)*(-1+cos(d*x+c))^2*(1+cos(d*x+c)
)^2*(44*I*cos(d*x+c)^8+44*sin(d*x+c)*cos(d*x+c)^7-15*I*cos(d*x+c)^6+7*cos(d
*x+c)^5*sin(d*x+c)+15*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)+9*cos(d*x+c)^3
*sin(d*x+c)+15*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)+15*cos(d*x+c)*sin(d*x+c))/e^3/si
n(d*x+c)^4
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\left(\frac{e}{\cos(c+d\,x)}\right)^{3/2}(a+a\tan(c+d\,x)\,1\mathrm{i})^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^3),x)
```

```
[Out] int(1/((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{i\int\frac{1}{(e\sec(c+dx))^{\frac{3}{2}}\tan^3(c+dx)-3i(e\sec(c+dx))^{\frac{3}{2}}\tan^2(c+dx)-3(e\sec(c+dx))^{\frac{3}{2}}\tan(c+dx)+i(e\sec(c+dx))^{\frac{3}{2}}}\,dx}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))**(3/2)/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] I*Integral(1/((e*sec(c + d*x))**(3/2)*tan(c + d*x)**3 - 3*I*(e*sec(c + d*x)
)**(3/2)*tan(c + d*x)**2 - 3*(e*sec(c + d*x))**(3/2)*tan(c + d*x) + I*(e*se
c(c + d*x))**(3/2)), x)/a**3
```

3.255 $\int \frac{(e\sec(c+dx))^{15/2}}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=192

$$\frac{154e^8E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^4d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{154e^7\sin(c+dx)\sqrt{e\sec(c+dx)}}{5a^4d}-\frac{154e^5\sin(c+dx)(e\sec(c+dx))^{5/2}}{15a^4d}+\frac{44}{3d\left(\right.}$$

```
[Out] -154/15*e^5*(e*sec(d*x+c))^(5/2)*sin(d*x+c)/a^4/d+154/5*e^8*(cos(1/2*d*x+1/
2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/a^4/
d/cos(d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)-154/5*e^7*sin(d*x+c)*(e*sec(d*x+c))
^(1/2)/a^4/d+4*I*e^2*(e*sec(d*x+c))^(11/2)/a/d/(a+I*a*tan(d*x+c))^3+44/3*I*
e^4*(e*sec(d*x+c))^(7/2)/d/(a^4+I*a^4*tan(d*x+c))
```

Rubi [A] time = 0.17, antiderivative size = 192, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3500, 3768, 3771, 2639}

$$-\frac{154e^7\sin(c+dx)\sqrt{e\sec(c+dx)}}{5a^4d}-\frac{154e^5\sin(c+dx)(e\sec(c+dx))^{5/2}}{15a^4d}+\frac{44ie^4(e\sec(c+dx))^{7/2}}{3d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{154e^8}{5a^4d\sqrt{\cos(}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(15/2)/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (154*e^8*EllipticE[(c + d*x)/2, 2])/(5*a^4*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[
c + d*x]]) - (154*e^7*Sqrt[e*Sec[c + d*x]]*Sin[c + d*x])/(5*a^4*d) - (154*e
^5*(e*Sec[c + d*x])^(5/2)*Sin[c + d*x])/(15*a^4*d) + ((4*I)*e^2*(e*Sec[c +
d*x])^(11/2))/(a*d*(a + I*a*Tan[c + d*x])^3) + (((44*I)/3)*e^4*(e*Sec[c + d
*x])^(7/2))/(d*(a^4 + I*a^4*Tan[c + d*x]))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{15/2}}{(a+ia\tan(c+dx))^4}\,dx = \frac{4ie^2(e\sec(c+dx))^{11/2}}{ad(a+ia\tan(c+dx))^3} - \frac{\left(11e^2\right)\int \frac{(e\sec(c+dx))^{11/2}}{(a+ia\tan(c+dx))^2}\,dx}{a^2}$$

$$= \frac{4ie^2(e\sec(c+dx))^{11/2}}{ad(a+ia\tan(c+dx))^3} + \frac{44ie^4(e\sec(c+dx))^{7/2}}{3d\left(a^4+ia^4\tan(c+dx)\right)} - \frac{\left(77e^4\right)\int (e\sec(c+dx))^{7/2}\,dx}{3a^4}$$

$$= -\frac{154e^5(e\sec(c+dx))^{5/2}\sin(c+dx)}{15a^4d} + \frac{4ie^2(e\sec(c+dx))^{11/2}}{ad(a+ia\tan(c+dx))^3} + \frac{44ie^4(e\sec(c+d}{3d\left(a^4+ia^4\tan(c\right.}$$

$$= -\frac{154e^7\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5a^4d} - \frac{154e^5(e\sec(c+dx))^{5/2}\sin(c+dx)}{15a^4d} + \frac{4ie^2(e\,\mathrm{se}}{ad(a+ia}$$

$$= -\frac{154e^7\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5a^4d} - \frac{154e^5(e\sec(c+dx))^{5/2}\sin(c+dx)}{15a^4d} + \frac{4ie^2(e\,\mathrm{se}}{ad(a+ia}$$

$$= \frac{154e^8E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^4d\sqrt{\cos(c+dx)}\,\sqrt{e\sec(c+dx)}} - \frac{154e^7\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5a^4d} - \frac{154e^5(e\sec}{}$$

Mathematica [C] time = 1.43, size = 124, normalized size = 0.65

$$-\frac{ie^5(e\sec(c+dx))^{5/2}\left(77e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)^{5/2}{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)-1133\cos(c+dx)-3(33i\sin(c+dx)+\right.}{30a^4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(15/2)/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] ((-1/30*I)*e^5*(e*Sec[c + d*x])^(5/2)*(-1133*Cos[c + d*x] + (77*(1 + E^((2*
I)*(c + d*x)))^(5/2)*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x))]
)/E^(I*(c + d*x)) - 3*(117*Cos[3*(c + d*x)] + (33*I)*Sin[c + d*x] + (37*I)*
Sin[3*(c + d*x)])))/(a^4*d)
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(462ie^7e^{(6idx+6ic)}+1232ie^7e^{(4idx+4ic)}+1034ie^7e^{(2idx+2ic)}+240ie^7\right)\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}\,e^{\left(\frac{1}{2}idx+\frac{1}{2}ic\right)}+15\left(a^4de^{(5idx+5}\right.}{15\left(a^4de^{(5idx+5ic)}+2a^4de^{(3idx+3ic)}+a^4de^{(}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(15/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/15*(sqrt(2)*(462*I*e^7*e^(6*I*d*x + 6*I*c) + 1232*I*e^7*e^(4*I*d*x + 4*I*
c) + 1034*I*e^7*e^(2*I*d*x + 2*I*c) + 240*I*e^7)*sqrt(e/(e^(2*I*d*x + 2*I*c
) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 15*(a^4*d*e^(5*I*d*x + 5*I*c) + 2*a^4*d*e
^(3*I*d*x + 3*I*c) + a^4*d*e^(I*d*x + I*c))*integral(-77/5*I*sqrt(2)*e^7*sq
rt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(a^4*d), x))/(a^4*d
*e^(5*I*d*x + 5*I*c) + 2*a^4*d*e^(3*I*d*x + 3*I*c) + a^4*d*e^(I*d*x + I*c))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{15}{2}}}{(ia\tan(dx+c)+a)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(15/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(15/2)/(I*a*tan(d*x + c) + a)^4, x)
```

maple [B] time = 1.49, size = 401, normalized size = 2.09

$$2\left(\frac{e}{\cos(dx+c)}\right)^{\frac{15}{2}}(-1+\cos(dx+c))^2(1+\cos(dx+c))^2\left(231i\sin(dx+c)\left(\cos^3(dx+c)\right)\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+}{1+\cos(dx}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(15/2)/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 2/15/a^4/d*(e/cos(d*x+c))^(15/2)*(-1+cos(d*x+c))^2*(1+cos(d*x+c))^2*(231*I*
cos(d*x+c)^3*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-231*I*cos(d*x+c)^3*sin(d*
x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I
*(-1+cos(d*x+c))/sin(d*x+c),I)+231*I*cos(d*x+c)^2*sin(d*x+c)*(1/(1+cos(d*x+
c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/si
n(d*x+c),I)-231*I*cos(d*x+c)^2*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x
+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)+120*I*c
os(d*x+c)^3*sin(d*x+c)-120*cos(d*x+c)^4+20*I*cos(d*x+c)*sin(d*x+c)+231*cos(
d*x+c)^3-114*cos(d*x+c)^2+3)*cos(d*x+c)^5/sin(d*x+c)^5
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(15/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{15/2}}{(a+a\tan(c+d\,x)\,1\mathrm{i})^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(15/2)/(a + a*tan(c + d*x)*1i)^4,x)
```

```
[Out] int((e/cos(c + d*x))^(15/2)/(a + a*tan(c + d*x)*1i)^4, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(15/2)/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Timed out
```

3.256 $\int \frac{(e\sec(c+dx))^{13/2}}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=157

$$-\frac{10e^6\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{a^4d}-\frac{10e^5\sin(c+dx)(e\sec(c+dx))^{3/2}}{a^4d}+\frac{12ie^4(e\sec(c+dx))^{5/2}}{d\left(a^4+ia^4\tan(c+dx)\right)}+$$

```
[Out] -10*e^5*(e*sec(d*x+c))^(3/2)*sin(d*x+c)/a^4/d-10*e^6*(cos(1/2*d*x+1/2*c)^2)
^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^
(1/2)*(e*sec(d*x+c))^(1/2)/a^4/d+4/3*I*e^2*(e*sec(d*x+c))^(9/2)/a/d/(a+I*a*
tan(d*x+c))^3+12*I*e^4*(e*sec(d*x+c))^(5/2)/d/(a^4+I*a^4*tan(d*x+c))
```

Rubi [A] time = 0.15, antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3500, 3768, 3771, 2641}

$$-\frac{10e^5\sin(c+dx)(e\sec(c+dx))^{3/2}}{a^4d}+\frac{12ie^4(e\sec(c+dx))^{5/2}}{d\left(a^4+ia^4\tan(c+dx)\right)}-\frac{10e^6\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{a^4d}+$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(13/2)/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (-10*e^6*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])
/(a^4*d) - (10*e^5*(e*Sec[c + d*x])^(3/2)*Sin[c + d*x])/(a^4*d) + (((4*I)/3
)*e^2*(e*Sec[c + d*x])^(9/2))/(a*d*(a + I*a*Tan[c + d*x])^3) + ((12*I)*e^4*
(e*Sec[c + d*x])^(5/2))/(d*(a^4 + I*a^4*Tan[c + d*x]))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{13/2}}{(a+ia\tan(c+dx))^4}dx = \frac{4ie^2(e\sec(c+dx))^{9/2}}{3ad(a+ia\tan(c+dx))^3} - \frac{(3e^2)\int \frac{(e\sec(c+dx))^{9/2}}{(a+ia\tan(c+dx))^2}dx}{a^2}$$
$$= \frac{4ie^2(e\sec(c+dx))^{9/2}}{3ad(a+ia\tan(c+dx))^3} + \frac{12ie^4(e\sec(c+dx))^{5/2}}{d\left(a^4+ia^4\tan(c+dx)\right)} - \frac{(15e^4)\int(e\sec(c+dx))^{5/2}}{a^4}$$
$$= -\frac{10e^5(e\sec(c+dx))^{3/2}\sin(c+dx)}{a^4d} + \frac{4ie^2(e\sec(c+dx))^{9/2}}{3ad(a+ia\tan(c+dx))^3} + \frac{12ie^4(e\sec(c+}{d\left(a^4+ia^4\tan(\right.}$$
$$= -\frac{10e^5(e\sec(c+dx))^{3/2}\sin(c+dx)}{a^4d} + \frac{4ie^2(e\sec(c+dx))^{9/2}}{3ad(a+ia\tan(c+dx))^3} + \frac{12ie^4(e\sec(c+}{d\left(a^4+ia^4\tan(\right.}$$
$$= -\frac{10e^6\sqrt{\cos(c+dx)}F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{a^4d} - \frac{10e^5(e\sec(c+dx))^{3/2}\sin(}{a^4d}$$

Mathematica [A] time = 0.59, size = 134, normalized size = 0.85

$$\frac{ie^6\sec^5(c+dx)\sqrt{e\sec(c+dx)}(\cos(3(c+dx))+i\sin(3(c+dx)))\left(11i\sin(2(c+dx))+19\cos(2(c+dx))+30i\right.}{3a^4d(\tan(c+dx)-i)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(13/2)/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] ((I/3)*e^6*Sec[c + d*x]^5*Sqrt[e*Sec[c + d*x]]*(21 + 19*Cos[2*(c + d*x)] +
(30*I)*Cos[c + d*x]^(3/2)*EllipticF[(c + d*x)/2, 2]*(Cos[c + d*x] + I*Sin[c
 + d*x]) + (11*I)*Sin[2*(c + d*x)])*(Cos[3*(c + d*x)] + I*Sin[3*(c + d*x)])
)/(a^4*d*(-I + Tan[c + d*x])^4)
```

fricas [F] time = 0.56, size = 0, normalized size = 0.00

$$\frac{\sqrt{2}\left(30i\,e^6e^{(4i\,dx+4i\,c)}+42i\,e^6e^{(2i\,dx+2i\,c)}+8i\,e^6\right)\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+3\left(a^4de^{(4i\,dx+4i\,c)}+a^4de^{(2i\,dx+2i\,c)}\right)\mathrm{integ}}{3\left(a^4de^{(4i\,dx+4i\,c)}+a^4de^{(2i\,dx+2i\,c)}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(13/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/3*(sqrt(2)*(30*I*e^6*e^(4*I*d*x + 4*I*c) + 42*I*e^6*e^(2*I*d*x + 2*I*c) +
 8*I*e^6)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 3*(a^
4*d*e^(4*I*d*x + 4*I*c) + a^4*d*e^(2*I*d*x + 2*I*c))*integral(5*I*sqrt(2)*e
^6*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(a^4*d), x))/
(a^4*d*e^(4*I*d*x + 4*I*c) + a^4*d*e^(2*I*d*x + 2*I*c))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{13}{2}}}{(i\,a\tan(dx+c)+a)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(13/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(13/2)/(I*a*tan(d*x + c) + a)^4, x)
```

maple [A] time = 1.43, size = 228, normalized size = 1.45

$$-\frac{2\left(\cos^5(dx+c)\right)\left(\frac{e}{\cos(dx+c)}\right)^{\frac{13}{2}}(-1+\cos(dx+c))^2(1+\cos(dx+c))^2\left(15i\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\left(\cos^2(dx+\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(13/2)/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] -2/3/a^4/d*cos(d*x+c)^5*(e/cos(d*x+c))^(13/2)*(-1+cos(d*x+c))^2*(1+cos(d*x+
c))^2*(15*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Elli
pticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)^2+15*I*(1/(1+cos(d*x+c)))^
(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x
+c),I)*cos(d*x+c)-8*I*cos(d*x+c)^3-8*cos(d*x+c)^2*sin(d*x+c)-12*I*cos(d*x+c
)-sin(d*x+c))/sin(d*x+c)^4
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(13/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{13/2}}{(a+a\tan(c+d\,x)\,1\mathrm{i})^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(13/2)/(a + a*tan(c + d*x)*1i)^4,x)
```

```
[Out] int((e/cos(c + d*x))^(13/2)/(a + a*tan(c + d*x)*1i)^4, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(13/2)/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Timed out
```

3.257 $\int \frac{(e \sec(c+dx))^{11/2}}{(a+ia \tan(c+dx))^4} \, dx$

Optimal. Leaf size=163

$$-\frac{42e^6E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^4d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{42e^5\sin(c+dx)\sqrt{e\sec(c+dx)}}{5a^4d}-\frac{28ie^4(e\sec(c+dx))^{3/2}}{5d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{4ie^2(e\sec(c}{5ad(a+ia\tan}$$

```
[Out] -42/5*e^6*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2
*d*x+1/2*c),2^(1/2))/a^4/d/cos(d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)+42/5*e^5*s
in(d*x+c)*(e*sec(d*x+c))^(1/2)/a^4/d+4/5*I*e^2*(e*sec(d*x+c))^(7/2)/a/d/(a+
I*a*tan(d*x+c))^3-28/5*I*e^4*(e*sec(d*x+c))^(3/2)/d/(a^4+I*a^4*tan(d*x+c))
```

Rubi [A] time = 0.15, antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3500, 3768, 3771, 2639}

$$\frac{42e^5\sin(c+dx)\sqrt{e\sec(c+dx)}}{5a^4d}-\frac{28ie^4(e\sec(c+dx))^{3/2}}{5d\left(a^4+ia^4\tan(c+dx)\right)}-\frac{42e^6E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^4d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{4ie^2(e\sec(c}{5ad(a+ia\tan}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(11/2)/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (-42*e^6*EllipticE[(c + d*x)/2, 2])/(5*a^4*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[
c + d*x]]) + (42*e^5*Sqrt[e*Sec[c + d*x]]*Sin[c + d*x])/(5*a^4*d) + (((4*I)
/5)*e^2*(e*Sec[c + d*x])^(7/2))/(a*d*(a + I*a*Tan[c + d*x])^3) - (((28*I)/5
)*e^4*(e*Sec[c + d*x])^(3/2))/(d*(a^4 + I*a^4*Tan[c + d*x]))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{11/2}}{(a+ia\tan(c+dx))^4}\,dx = \frac{4ie^2(e\sec(c+dx))^{7/2}}{5ad(a+ia\tan(c+dx))^3} - \frac{\left(7e^2\right)\int \frac{(e\sec(c+dx))^{7/2}}{(a+ia\tan(c+dx))^2}\,dx}{5a^2}$$
$$= \frac{4ie^2(e\sec(c+dx))^{7/2}}{5ad(a+ia\tan(c+dx))^3} - \frac{28ie^4(e\sec(c+dx))^{3/2}}{5d\left(a^4+ia^4\tan(c+dx)\right)} + \frac{\left(21e^4\right)\int (e\sec(c+dx))^{3/2}\,dx}{5a^4}$$
$$= \frac{42e^5\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5a^4d} + \frac{4ie^2(e\sec(c+dx))^{7/2}}{5ad(a+ia\tan(c+dx))^3} - \frac{28ie^4(e\sec(c+dx))^{3}}{5d\left(a^4+ia^4\tan(c+\right.}$$
$$= \frac{42e^5\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5a^4d} + \frac{4ie^2(e\sec(c+dx))^{7/2}}{5ad(a+ia\tan(c+dx))^3} - \frac{28ie^4(e\sec(c+dx))^{3}}{5d\left(a^4+ia^4\tan(c+\right.}$$
$$= -\frac{42e^6E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^4d\sqrt{\cos(c+dx)}\,\sqrt{e\sec(c+dx)}} + \frac{42e^5\sqrt{e\sec(c+dx)}\,\sin(c+dx)}{5a^4d} + \frac{4ie^2(e\,\mathrm{se}}{5ad(a+ia}$$

Mathematica [C] time = 0.63, size = 106, normalized size = 0.65

$$-\frac{2ie^5e^{-3i(c+dx)}\left(21e^{2i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\;{}_2F_1\left(-\frac{1}{4},\frac{1}{2};\frac{3}{4};-e^{2i(c+dx)}\right)-7e^{2i(c+dx)}-2\right)\sqrt{e\sec(c+dx)}}{5a^4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(11/2)/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (((-2*I)/5)*e^5*(-2 - 7*E^((2*I)*(c + d*x)) + 21*E^((2*I)*(c + d*x))*Sqrt[1
 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3/4, -E^((2*I)*(c + d*
x))])*Sqrt[e*Sec[c + d*x]])/(a^4*d*E^((3*I)*(c + d*x)))
```

fricas [F] time = 1.11, size = 0, normalized size = 0.00

$$\frac{\left(5\,a^4de^{(3i\,dx+3i\,c)}\mathrm{integral}\left(\frac{21i\,\sqrt{2}\,e^5\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}}{5\,a^4d},x\right)+\sqrt{2}\left(-42i\,e^5e^{(4i\,dx+4i\,c)}-28i\,e^5e^{(2i\,dx+2i\,c)}+4i\,e^5\right)\sqrt{\frac{}{e^{(2i}}}\right.}{5\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(11/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/5*(5*a^4*d*e^(3*I*d*x + 3*I*c)*integral(21/5*I*sqrt(2)*e^5*sqrt(e/(e^(2*I
*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(a^4*d), x) + sqrt(2)*(-42*I*e^
5*e^(4*I*d*x + 4*I*c) - 28*I*e^5*e^(2*I*d*x + 2*I*c) + 4*I*e^5)*sqrt(e/(e^(
2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))*e^(-3*I*d*x - 3*I*c)/(a^4*d
)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{11}{2}}}{(i\,a\tan(dx+c)+a)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(11/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(11/2)/(I*a*tan(d*x + c) + a)^4, x)
```

maple [B] time = 1.44, size = 379, normalized size = 2.33

$$-\frac{2\left(21 i \cos \left(d x+c\right) \sqrt{\frac{1}{1+\cos(dx+c)}}\, \sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\, \mathrm{EllipticF}\left(\frac{i(-1+\cos(dx+c))}{\sin(dx+c)}, i\right) \sin \left(d x+c\right)-21 i \cos \left(d x+c\right) \sqrt{\frac{1}{1+\cos(dx+c)}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(11/2)/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] -2/5/a^4/d*(21*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*sin(d*x+c)*cos(d*x+c)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-21*I*Ellip
ticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)*cos(d*x+c)*sin(d*x+c)-8*I*cos(d*x+c)^3*sin(d*x+c)+21*I
*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)*Elli
pticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-21*I*EllipticE(I*(-1+cos(d*x+c))/sin(
d*x+c),I)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*
x+c)+8*cos(d*x+c)^4+20*I*cos(d*x+c)*sin(d*x+c)-24*cos(d*x+c)^2+21*cos(d*x+c
)-5)*cos(d*x+c)^5*(e/cos(d*x+c))^(11/2)*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2/
sin(d*x+c)^5
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(11/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{11/2}}{{\left(a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^4} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(11/2)/(a + a*tan(c + d*x)*1i)^4,x)
```

```
[Out] int((e/cos(c + d*x))^(11/2)/(a + a*tan(c + d*x)*1i)^4, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(11/2)/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Timed out
```

3.258 $\int \frac{(e\sec(c+dx))^{9/2}}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=132

$$-\frac{20ie^4\sqrt{e\sec(c+dx)}}{21d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{10e^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{21a^4d}+\frac{4ie^2(e\sec(c+dx))^{5/2}}{7ad(a+ia\tan(c+dx))^3}$$

```
[Out] 10/21*e^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2
*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)*(e*sec(d*x+c))^(1/2)/a^4/d+4/7*I*e^2*
(e*sec(d*x+c))^(5/2)/a/d/(a+I*a*tan(d*x+c))^3-20/21*I*e^4*(e*sec(d*x+c))^(1
/2)/d/(a^4+I*a^4*tan(d*x+c))
```

Rubi [A] time = 0.14, antiderivative size = 132, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.107$, Rules used = {3500, 3771, 2641}

$$-\frac{20ie^4\sqrt{e\sec(c+dx)}}{21d\left(a^4+ia^4\tan(c+dx)\right)}+\frac{10e^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{21a^4d}+\frac{4ie^2(e\sec(c+dx))^{5/2}}{7ad(a+ia\tan(c+dx))^3}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(9/2)/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (10*e^4*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/
(21*a^4*d) + (((4*I)/7)*e^2*(e*Sec[c + d*x])^(5/2))/(a*d*(a + I*a*Tan[c + d
*x])^3) - (((20*I)/21)*e^4*Sqrt[e*Sec[c + d*x]])/(d*(a^4 + I*a^4*Tan[c + d*
x]))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{9/2}}{(a+ia\tan(c+dx))^4}\,dx = \frac{4ie^2(e\sec(c+dx))^{5/2}}{7ad(a+ia\tan(c+dx))^3} - \frac{(5e^2)\int \frac{(e\sec(c+dx))^{5/2}}{(a+ia\tan(c+dx))^2}\,dx}{7a^2}$$
$$= \frac{4ie^2(e\sec(c+dx))^{5/2}}{7ad(a+ia\tan(c+dx))^3} - \frac{20ie^4\sqrt{e\sec(c+dx)}}{21d\left(a^4+ia^4\tan(c+dx)\right)} + \frac{(5e^4)\int \sqrt{e\sec(c+dx)}\,d}{21a^4}$$
$$= \frac{4ie^2(e\sec(c+dx))^{5/2}}{7ad(a+ia\tan(c+dx))^3} - \frac{20ie^4\sqrt{e\sec(c+dx)}}{21d\left(a^4+ia^4\tan(c+dx)\right)} + \frac{\left(5e^4\sqrt{\cos(c+dx)}\sqrt{e\sec}\right.}{2}$$
$$= \frac{10e^4\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{21a^4d} + \frac{4ie^2(e\sec(c+dx))^{5/2}}{7ad(a+ia\tan(c+dx))^3} -$$

Mathematica [A] time = 0.56, size = 137, normalized size = 1.04

$$\frac{2e^4\sec^4(c+dx)\sqrt{e\sec(c+dx)}\,(\cos(2(c+dx))+i\sin(2(c+dx)))\left(5\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)(\cos(2(c+\right.}{21a^4d(\tan(c+dx)-i)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(9/2)/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (2*e^4*Sec[c + d*x]^4*Sqrt[e*Sec[c + d*x]]*(5*Sqrt[Cos[c + d*x]]*EllipticF[
(c + d*x)/2, 2]*(Cos[2*(c + d*x)] + I*Sin[2*(c + d*x)]) - (2*I)*(1 + Cos[2*
(c + d*x)] + (4*I)*Sin[2*(c + d*x)]))*(Cos[2*(c + d*x)] + I*Sin[2*(c + d*x)
]))/(21*a^4*d*(-I + Tan[c + d*x])^4)
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\frac{\left(21\,a^4de^{(4i\,dx+4i\,c)}\mathrm{integral}\left(-\frac{5i\,\sqrt{2}\,e^4\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{21\,a^4d},x\right)+\sqrt{2}\left(-10i\,e^4e^{(4i\,dx+4i\,c)}-4i\,e^4e^{(2i\,dx+2i\,c)}+6i\,e^4\right)\right.}{21\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(9/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/21*(21*a^4*d*e^(4*I*d*x + 4*I*c)*integral(-5/21*I*sqrt(2)*e^4*sqrt(e/(e^(
2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(a^4*d), x) + sqrt(2)*(-10*
I*e^4*e^(4*I*d*x + 4*I*c) - 4*I*e^4*e^(2*I*d*x + 2*I*c) + 6*I*e^4)*sqrt(e/(
e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))*e^(-4*I*d*x - 4*I*c)/(a^
4*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{9}{2}}}{(i\,a\tan(dx+c)+a)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(9/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(9/2)/(I*a*tan(d*x + c) + a)^4, x)
```

maple [A] time = 1.37, size = 228, normalized size = 1.73

$$\frac{2\left(1+\cos\left(dx+c\right)\right)^{2}\left(\cos^{4}\left(dx+c\right)\right)\left(\frac{e}{\cos(dx+c)}\right)^{\frac{9}{2}}\left(-1+\cos\left(dx+c\right)\right)^{2}\left(5i\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\,\mathrm{EllipticF}\left(\frac{i(-1\cdots}{s\cdots}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(9/2)/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 2/21/a^4/d*(1+cos(d*x+c))^2*cos(d*x+c)^4*(e/cos(d*x+c))^(9/2)*(-1+cos(d*x+c
))^2*(5*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Ellipt
icF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)+24*I*cos(d*x+c)^4+5*I*(1/(1+
cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*
x+c))/sin(d*x+c),I)+24*cos(d*x+c)^3*sin(d*x+c)-28*I*cos(d*x+c)^2-16*cos(d*x
+c)*sin(d*x+c))/sin(d*x+c)^4
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(9/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{9/2}}{\left(a+a\tan\left(c+d\,x\right)\,1\mathrm{i}\right)^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(9/2)/(a + a*tan(c + d*x)*1i)^4,x)
```

```
[Out] int((e/cos(c + d*x))^(9/2)/(a + a*tan(c + d*x)*1i)^4, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(9/2)/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Timed out
```

3.259 $\int \frac{(e\sec(c+dx))^{7/2}}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=132

$$-\frac{4ie^4}{15d\left(a^4+ia^4\tan(c+dx)\right)\sqrt{e\sec(c+dx)}}-\frac{2e^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15a^4d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{4ie^2(e\sec(c+dx))^{3/2}}{9ad(a+ia\tan(c+dx))^3}$$

```
[Out] -2/15*e^4*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2
*d*x+1/2*c),2^(1/2))/a^4/d/cos(d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)+4/9*I*e^2*
(e*sec(d*x+c))^(3/2)/a/d/(a+I*a*tan(d*x+c))^3-4/15*I*e^4/d/(e*sec(d*x+c))^(
1/2)/(a^4+I*a^4*tan(d*x+c))
```

Rubi [A] time = 0.14, antiderivative size = 132, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.107, Rules used = {3500, 3771, 2639}

$$-\frac{4ie^4}{15d\left(a^4+ia^4\tan(c+dx)\right)\sqrt{e\sec(c+dx)}}-\frac{2e^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15a^4d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{4ie^2(e\sec(c+dx))^{3/2}}{9ad(a+ia\tan(c+dx))^3}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(7/2)/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (-2*e^4*EllipticE[(c + d*x)/2, 2])/(15*a^4*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[
c + d*x]]) + (((4*I)/9)*e^2*(e*Sec[c + d*x])^(3/2))/(a*d*(a + I*a*Tan[c + d
*x])^3) - (((4*I)/15)*e^4)/(d*Sqrt[e*Sec[c + d*x]]*(a^4 + I*a^4*Tan[c + d*x
]))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{7/2}}{(a+ia\tan(c+dx))^4}\,dx = \frac{4ie^2(e\sec(c+dx))^{3/2}}{9ad(a+ia\tan(c+dx))^3} - \frac{e^2\int \frac{(e\sec(c+dx))^{3/2}}{(a+ia\tan(c+dx))^2}dx}{3a^2}$$

$$= \frac{4ie^2(e\sec(c+dx))^{3/2}}{9ad(a+ia\tan(c+dx))^3} - \frac{4ie^4}{15d\sqrt{e\sec(c+dx)}\left(a^4+ia^4\tan(c+dx)\right)} - \frac{e^4\int \frac{1}{\sqrt{e\sec(c+}}}{15a^4}$$

$$= \frac{4ie^2(e\sec(c+dx))^{3/2}}{9ad(a+ia\tan(c+dx))^3} - \frac{4ie^4}{15d\sqrt{e\sec(c+dx)}\left(a^4+ia^4\tan(c+dx)\right)} - \frac{e^4\int \sqrt{}}{15a^4\sqrt{\cos(c}}$$

$$= -\frac{2e^4E\left(\frac{1}{2}(c+dx)\middle|2\right)}{15a^4d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}} + \frac{4ie^2(e\sec(c+dx))^{3/2}}{9ad(a+ia\tan(c+dx))^3} - \frac{}{15d\sqrt{e\sec(c+d}}$$

Mathematica [C] time = 0.80, size = 149, normalized size = 1.13

$$\frac{e^3e^{-idx}\sec^4(c+dx)\sqrt{e\sec(c+dx)}\,(\sin(c+2dx)-i\cos(c+2dx))\left(6e^{2i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\,{}_2F_1\left(-\frac{1}{4},\frac{1}{2};\frac{3}{4};-e^{2i(c+dx)}\right)\right.}{45a^4d(\tan(c+dx)-i)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(7/2)/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (e^3*Sec[c + d*x]^4*Sqrt[e*Sec[c + d*x]]*(-7 - 7*Cos[2*(c + d*x)] + 6*E^((2
*I)*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[-1/4, 1/2, 3
/4, -E^((2*I)*(c + d*x))] + (3*I)*Sin[2*(c + d*x)])*((-I)*Cos[c + 2*d*x] +
Sin[c + 2*d*x]))/(45*a^4*d*E^(I*d*x)*(-I + Tan[c + d*x])^4)
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\frac{\left(45\,a^4de^{(5i\,dx+5i\,c)}\text{integral}\left(\frac{i\sqrt{2}e^3\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}}{15\,a^4d},x\right)+\sqrt{2}\left(-6i\,e^3e^{(6i\,dx+6i\,c)}-4i\,e^3e^{(4i\,dx+4i\,c)}+7i\,e^3e^{(2i\,dx+2i\,c)}\right.\right.}{45\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/45*(45*a^4*d*e^(5*I*d*x + 5*I*c)*integral(1/15*I*sqrt(2)*e^3*sqrt(e/(e^(2
*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(a^4*d), x) + sqrt(2)*(-6*I*e
^3*e^(6*I*d*x + 6*I*c) - 4*I*e^3*e^(4*I*d*x + 4*I*c) + 7*I*e^3*e^(2*I*d*x +
 2*I*c) + 5*I*e^3)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c
))*e^(-5*I*d*x - 5*I*c)/(a^4*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{7}{2}}}{(i\,a\tan(dx+c)+a)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(7/2)/(I*a*tan(d*x + c) + a)^4, x)
```

maple [B] time = 1.41, size = 390, normalized size = 2.95

$$-\frac{2\left(-40i\left(\cos^5(dx+c)\right)\sin(dx+c)+40\left(\cos^6(dx+c)\right)+3i\cos(dx+c)\sqrt{\frac{1}{1+\cos(dx+c)}}\sqrt{\frac{\cos(dx+c)}{1+\cos(dx+c)}}\ \text{Ellipticl}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] -2/45/a^4/d*(-40*I*cos(d*x+c)^5*sin(d*x+c)+40*cos(d*x+c)^6+3*I*sin(d*x+c)*c
os(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Ellipt
icF(I*(-1+cos(d*x+c))/sin(d*x+c),I)-3*I*sin(d*x+c)*cos(d*x+c)*(1/(1+cos(d*x
+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/s
in(d*x+c),I)+36*I*cos(d*x+c)^3*sin(d*x+c)+3*I*sin(d*x+c)*(1/(1+cos(d*x+c)))
^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*
x+c),I)-3*I*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))
^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)-56*cos(d*x+c)^4+13*cos(d*x
+c)^2+3*cos(d*x+c))*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(e/cos(d*x+c))^(7/2)
*cos(d*x+c)^3/sin(d*x+c)^5
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{7/2}}{\left(a+a\tan(c+d\,x)\,1\mathrm{i}\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(7/2)/(a + a*tan(c + d*x)*1i)^4,x)
```

```
[Out] int((e/cos(c + d*x))^(7/2)/(a + a*tan(c + d*x)*1i)^4, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(7/2)/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Timed out
```

3.260 $\int \frac{(e\sec(c+dx))^{5/2}}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=163

$$-\frac{4ie^4}{77d\left(a^4+ia^4\tan(c+dx)\right)(e\sec(c+dx))^{3/2}}-\frac{2e^3\sin(c+dx)}{77a^4d\sqrt{e\sec(c+dx)}}-\frac{2e^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+}}{77a^4d}$$

```
[Out] -2/77*e^3*sin(d*x+c)/a^4/d/(e*sec(d*x+c))^(1/2)-2/77*e^2*(cos(1/2*d*x+1/2*c
)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x
+c)^(1/2)*(e*sec(d*x+c))^(1/2)/a^4/d+4/11*I*e^2*(e*sec(d*x+c))^(1/2)/a/d/(a
+I*a*tan(d*x+c))^3-4/77*I*e^4/d/(e*sec(d*x+c))^(3/2)/(a^4+I*a^4*tan(d*x+c))
```

Rubi [A] time = 0.14, antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3500, 3769, 3771, 2641}

$$-\frac{2e^3\sin(c+dx)}{77a^4d\sqrt{e\sec(c+dx)}}-\frac{4ie^4}{77d\left(a^4+ia^4\tan(c+dx)\right)(e\sec(c+dx))^{3/2}}-\frac{2e^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+}}{77a^4d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(5/2)/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (-2*e^2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/
(77*a^4*d) - (2*e^3*Sin[c + d*x])/(77*a^4*d*Sqrt[e*Sec[c + d*x]]) + (((4*I)
/11)*e^2*Sqrt[e*Sec[c + d*x]])/(a*d*(a + I*a*Tan[c + d*x])^3) - (((4*I)/77)
*e^4)/(d*(e*Sec[c + d*x])^(3/2)*(a^4 + I*a^4*Tan[c + d*x]))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{5/2}}{(a+ia\tan(c+dx))^4}\,dx = \frac{4ie^2\sqrt{e\sec(c+dx)}}{11ad(a+ia\tan(c+dx))^3} - \frac{e^2\int \frac{\sqrt{e\sec(c+dx)}}{(a+ia\tan(c+dx))^2}\,dx}{11a^2}$$

$$= \frac{4ie^2\sqrt{e\sec(c+dx)}}{11ad(a+ia\tan(c+dx))^3} - \frac{4ie^4}{77d(e\sec(c+dx))^{3/2}\left(a^4+ia^4\tan(c+dx)\right)} - \frac{(3e^4)\ldots}{}$$

$$= -\frac{2e^3\sin(c+dx)}{77a^4d\sqrt{e\sec(c+dx)}} + \frac{4ie^2\sqrt{e\sec(c+dx)}}{11ad(a+ia\tan(c+dx))^3} - \frac{4ie^4}{77d(e\sec(c+dx))^{3/2}\left(a^4+\ldots\right.}$$

$$= -\frac{2e^3\sin(c+dx)}{77a^4d\sqrt{e\sec(c+dx)}} + \frac{4ie^2\sqrt{e\sec(c+dx)}}{11ad(a+ia\tan(c+dx))^3} - \frac{4ie^4}{77d(e\sec(c+dx))^{3/2}\left(a^4+\ldots\right.}$$

$$= -\frac{2e^2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{77a^4d} - \frac{2e^3\sin(c+dx)}{77a^4d\sqrt{e\sec(c+dx)}} + \frac{\ldots}{11\ldots}$$

Mathematica [A] time = 0.61, size = 144, normalized size = 0.88

$$\frac{\sec^2(c+dx)(e\sec(c+dx))^{5/2}(\cos(c+dx)+i\sin(c+dx))\left(3\sin(c+dx)+3\sin(3(c+dx))+37i\cos(c+dx)+\ldots\right.}{154a^4d(\tan(c+dx)-i\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(5/2)/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (Sec[c + d*x]^2*(e*Sec[c + d*x])^(5/2)*(Cos[c + d*x] + I*Sin[c + d*x])*((37
*I)*Cos[c + d*x] + (11*I)*Cos[3*(c + d*x)] + 3*Sin[c + d*x] - 4*Sqrt[Cos[c
+ d*x]]*EllipticF[(c + d*x)/2, 2]*(Cos[3*(c + d*x)] + I*Sin[3*(c + d*x)]) +
 3*Sin[3*(c + d*x)]))/(154*a^4*d*(-I + Tan[c + d*x])^4)
```

fricas [F] time = 0.57, size = 0, normalized size = 0.00

$$\frac{\left(154\,a^4de^{(6i\,dx+6i\,c)}\text{integral}\left(\frac{i\,\sqrt{2}e^2\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{77\,a^4d},x\right)+\sqrt{2}\left(4i\,e^2e^{(6i\,dx+6i\,c)}+17i\,e^2e^{(4i\,dx+4i\,c)}+20i\,e^2e^{(2i\ldots}\right.\right.}{154\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/154*(154*a^4*d*e^(6*I*d*x + 6*I*c)*integral(1/77*I*sqrt(2)*e^2*sqrt(e/(e^
(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(a^4*d), x) + sqrt(2)*(4*I
*e^2*e^(6*I*d*x + 6*I*c) + 17*I*e^2*e^(4*I*d*x + 4*I*c) + 20*I*e^2*e^(2*I*d
*x + 2*I*c) + 7*I*e^2)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2
*I*c))*e^(-6*I*d*x - 6*I*c)/(a^4*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{5}{2}}}{(i\,a\tan(dx+c)+a)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(5/2)/(I*a*tan(d*x + c) + a)^4, x)
```

maple [A] time = 1.38, size = 243, normalized size = 1.49

$$-\frac{2\left(\frac{e}{\cos(dx+c)}\right)^{\frac{5}{2}}(-1+\cos(dx+c))^2(1+\cos(dx+c))^2\left(\cos^2(dx+c)\right)\left(-56i\left(\cos^6(dx+c)\right)-56\left(\cos^5(dx+c)\right)\text{s}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] -2/77/a^4/d*(e/cos(d*x+c))^(5/2)*(-1+cos(d*x+c))^2*(1+cos(d*x+c))^2*cos(d*x
+c)^2*(-56*I*cos(d*x+c)^6-56*cos(d*x+c)^5*sin(d*x+c)+I*(1/(1+cos(d*x+c)))^(
1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+
c),I)*cos(d*x+c)+44*I*cos(d*x+c)^4+I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)+16*cos(d*x+c
)^3*sin(d*x+c)+cos(d*x+c)*sin(d*x+c))/sin(d*x+c)^4
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{5/2}}{(a+a\tan(c+d\,x)\,1\mathrm{i})^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(5/2)/(a + a*tan(c + d*x)*1i)^4,x)
```

```
[Out] int((e/cos(c + d*x))^(5/2)/(a + a*tan(c + d*x)*1i)^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{(e\sec(c+dx))^{\frac{5}{2}}}{\tan^4(c+dx)-4i\tan^3(c+dx)-6\tan^2(c+dx)+4i\tan(c+dx)+1}\,dx}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(5/2)/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Integral((e*sec(c + d*x))**(5/2)/(tan(c + d*x)**4 - 4*I*tan(c + d*x)**3 - 6
*tan(c + d*x)**2 + 4*I*tan(c + d*x) + 1), x)/a**4
```

3.261 $\int \frac{(e\sec(c+dx))^{3/2}}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=163

$$\frac{4ie^4}{117d\left(a^4+ia^4\tan(c+dx)\right)(e\sec(c+dx))^{5/2}}+\frac{2e^3\sin(c+dx)}{117a^4d(e\sec(c+dx))^{3/2}}+\frac{2e^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{39a^4d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+$$

```
[Out] 2/117*e^3*sin(d*x+c)/a^4/d/(e*sec(d*x+c))^(3/2)+2/39*e^2*(cos(1/2*d*x+1/2*c
)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/a^4/d/c
os(d*x+c)^(1/2)/(e*sec(d*x+c))^(1/2)+4/13*I*e^2/a/d/(e*sec(d*x+c))^(1/2)/(a
+I*a*tan(d*x+c))^3+4/117*I*e^4/d/(e*sec(d*x+c))^(5/2)/(a^4+I*a^4*tan(d*x+c)
)
```

Rubi [A] time = 0.15, antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3500, 3769, 3771, 2639}

$$\frac{2e^3\sin(c+dx)}{117a^4d(e\sec(c+dx))^{3/2}}+\frac{4ie^4}{117d\left(a^4+ia^4\tan(c+dx)\right)(e\sec(c+dx))^{5/2}}+\frac{2e^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{39a^4d\sqrt{\cos(c+dx)}\sqrt{e\sec(c+dx)}}+$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(3/2)/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (2*e^2*EllipticE[(c + d*x)/2, 2])/(39*a^4*d*Sqrt[Cos[c + d*x]]*Sqrt[e*Sec[c
 + d*x]]) + (2*e^3*Sin[c + d*x])/(117*a^4*d*(e*Sec[c + d*x])^(3/2)) + (((4*
I)/13)*e^2)/(a*d*Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^3) + (((4*I)/1
17)*e^4)/(d*(e*Sec[c + d*x])^(5/2)*(a^4 + I*a^4*Tan[c + d*x]))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{3/2}}{(a+ia\tan(c+dx))^4}\,dx = \frac{4ie^2}{13ad\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^3} + \frac{e^2\int \frac{1}{\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^2}\,dx}{13a^2}$$

$$= \frac{4ie^2}{13ad\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^3} + \frac{4ie^4}{117d(e\sec(c+dx))^{5/2}\left(a^4+ia^4\tan(c+\right.}$$

$$= \frac{2e^3\sin(c+dx)}{117a^4d(e\sec(c+dx))^{3/2}} + \frac{4ie^2}{13ad\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^3} + \frac{}{117d(e\sec(c}$$

$$= \frac{2e^3\sin(c+dx)}{117a^4d(e\sec(c+dx))^{3/2}} + \frac{4ie^2}{13ad\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^3} + \frac{}{117d(e\sec(c}$$

$$= \frac{2e^2E\left(\frac{1}{2}(c+dx)\middle|2\right)}{39a^4d\sqrt{\cos(c+dx)}\,\sqrt{e\sec(c+dx)}} + \frac{2e^3\sin(c+dx)}{117a^4d(e\sec(c+dx))^{3/2}} + \frac{}{13ad\sqrt{e\sec(c+d}}$$

Mathematica [C] time = 1.52, size = 142, normalized size = 0.87

$$\frac{ie^{-idx}\sec^2(c+dx)(\cos(dx)+i\sin(dx))(e\sec(c+dx))^{3/2}\left(\frac{24e^{4i(c+dx)}\,{}_2F_1\left(-\frac{1}{4},\frac{1}{2};\frac{3}{4};-e^{2i(c+dx)}\right)}{\sqrt{1+e^{2i(c+dx)}}}+22i\sin(2(c+dx))+40\cos\right.}{234a^4d(\tan(c+dx)-i)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(3/2)/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] ((I/234)*Sec[c + d*x]^2*(e*Sec[c + d*x])^(3/2)*(Cos[d*x] + I*Sin[d*x])*(28
+ 40*Cos[2*(c + d*x)] + (24*E^((4*I)*(c + d*x))*Hypergeometric2F1[-1/4, 1/2
, 3/4, -E^((2*I)*(c + d*x))])/Sqrt[1 + E^((2*I)*(c + d*x))] + (22*I)*Sin[2*
(c + d*x)]))/(a^4*d*E^(I*d*x)*(-I + Tan[c + d*x])^4)
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\frac{\left(468\,a^4de^{(7i\,dx+7i\,c)}\text{integral}\left(-\frac{i\sqrt{2}e\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}}{39\,a^4d},x\right)+\sqrt{2}\left(24i\,ee^{(8i\,dx+8i\,c)}+55i\,ee^{(6i\,dx+6i\,c)}+59i\,ee^{(4i\,dx+4i}\right.\right.}{468\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/468*(468*a^4*d*e^(7*I*d*x + 7*I*c)*integral(-1/39*I*sqrt(2)*e*sqrt(e/(e^(
2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(a^4*d), x) + sqrt(2)*(24*I*
e*e^(8*I*d*x + 8*I*c) + 55*I*e*e^(6*I*d*x + 6*I*c) + 59*I*e*e^(4*I*d*x + 4*
I*c) + 37*I*e*e^(2*I*d*x + 2*I*c) + 9*I*e)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1)
)*e^(1/2*I*d*x + 1/2*I*c))*e^(-7*I*d*x - 7*I*c)/(a^4*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{3}{2}}}{(i\,a\tan(dx+c)+a)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(3/2)/(I*a*tan(d*x + c) + a)^4, x)
```

maple [B] time = 1.42, size = 398, normalized size = 2.44

$$-\frac{2\left(-72i\left(\cos^{7}\left(dx+c\right)\right)\sin\left(dx+c\right)+72\left(\cos^{8}\left(dx+c\right)\right)+52i\left(\cos^{5}\left(dx+c\right)\right)\sin\left(dx+c\right)-88\left(\cos^{6}\left(dx+c\right)\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] -2/117/a^4/d*(-72*I*cos(d*x+c)^7*sin(d*x+c)+72*cos(d*x+c)^8+52*I*cos(d*x+c)
^5*sin(d*x+c)-88*cos(d*x+c)^6+3*I*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(
d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticE(I*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(
d*x+c)-3*I*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(d*x+c)+3*I*(1/(1+cos(d*
x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)*EllipticE(I*(-1+c
os(d*x+c))/sin(d*x+c),I)-3*I*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*sin(
d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+17*cos(d*
x+c)^4+2*cos(d*x+c)^2-3*cos(d*x+c))*(1+cos(d*x+c))^2*(-1+cos(d*x+c))^2*(e/c
os(d*x+c))^(3/2)*cos(d*x+c)/sin(d*x+c)^5
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(\frac{e}{\cos\left(c+d\,x\right)}\right)}^{3/2}}{{\left(a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^4} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(3/2)/(a + a*tan(c + d*x)*1i)^4,x)
```

```
[Out] int((e/cos(c + d*x))^(3/2)/(a + a*tan(c + d*x)*1i)^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\left(e \sec{\left(c + d x \right)}\right)^{\frac{3}{2}}}{\tan^{4}{\left(c + d x \right)} - 4 i \tan^{3}{\left(c + d x \right)} - 6 \tan^{2}{\left(c + d x \right)} + 4 i \tan{\left(c + d x \right)} + 1}\, dx}{a^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(3/2)/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Integral((e*sec(c + d*x))**(3/2)/(tan(c + d*x)**4 - 4*I*tan(c + d*x)**3 - 6
*tan(c + d*x)**2 + 4*I*tan(c + d*x) + 1), x)/a**4
```

3.262 $\int \frac{\sqrt{e \sec(c+dx)}}{(a+ia\tan(c+dx))^4}\,dx$

Optimal. Leaf size=191

$$\frac{4ie^2}{33d\left(a^4+ia^4\tan(c+dx)\right)(e\sec(c+dx))^{3/2}}+\frac{2e\sin(c+dx)}{33a^4d\sqrt{e\sec(c+dx)}}+\frac{2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{33a^4d}$$

```
[Out] 2/33*e*sin(d*x+c)/a^4/d/(e*sec(d*x+c))^(1/2)+2/33*(cos(1/2*d*x+1/2*c)^2)^(1
/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/
2)*(e*sec(d*x+c))^(1/2)/a^4/d+2/15*I*(e*sec(d*x+c))^(1/2)/d/(a+I*a*tan(d*x+
c))^4+14/165*I*(e*sec(d*x+c))^(1/2)/a/d/(a+I*a*tan(d*x+c))^3+4/33*I*e^2/d/(
e*sec(d*x+c))^(3/2)/(a^4+I*a^4*tan(d*x+c))
```

Rubi [A] time = 0.19, antiderivative size = 191, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used = {3502, 3500, 3769, 3771, 2641}

$$\frac{4ie^2}{33d\left(a^4+ia^4\tan(c+dx)\right)(e\sec(c+dx))^{3/2}}+\frac{2e\sin(c+dx)}{33a^4d\sqrt{e\sec(c+dx)}}+\frac{2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{33a^4d}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Sec[c + d*x]]/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2]*Sqrt[e*Sec[c + d*x]])/(33*a
^4*d) + (2*e*Sin[c + d*x])/(33*a^4*d*Sqrt[e*Sec[c + d*x]]) + (((2*I)/15)*Sq
rt[e*Sec[c + d*x]])/(d*(a + I*a*Tan[c + d*x])^4) + (((14*I)/165)*Sqrt[e*Sec
[c + d*x]])/(a*d*(a + I*a*Tan[c + d*x])^3) + (((4*I)/33)*e^2)/(d*(e*Sec[c +
 d*x])^(3/2)*(a^4 + I*a^4*Tan[c + d*x]))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
```

```
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{\sqrt{e\sec(c+dx)}}{(a+ia\tan(c+dx))^4}\,dx = \frac{2i\sqrt{e\sec(c+dx)}}{15d(a+ia\tan(c+dx))^4} + \frac{7\int \frac{\sqrt{e\sec(c+dx)}}{(a+ia\tan(c+dx))^3}\,dx}{15a}$$

$$= \frac{2i\sqrt{e\sec(c+dx)}}{15d(a+ia\tan(c+dx))^4} + \frac{14i\sqrt{e\sec(c+dx)}}{165ad(a+ia\tan(c+dx))^3} + \frac{7\int \frac{\sqrt{e\sec(c+dx)}}{(a+ia\tan(c+dx))^2}\,dx}{33a^2}$$

$$= \frac{2i\sqrt{e\sec(c+dx)}}{15d(a+ia\tan(c+dx))^4} + \frac{14i\sqrt{e\sec(c+dx)}}{165ad(a+ia\tan(c+dx))^3} + \frac{4ie^2}{33d(e\sec(c+dx))^{3/2}\,(a}$$

$$= \frac{2e\sin(c+dx)}{33a^4d\sqrt{e\sec(c+dx)}} + \frac{2i\sqrt{e\sec(c+dx)}}{15d(a+ia\tan(c+dx))^4} + \frac{14i\sqrt{e\sec(c+dx)}}{165ad(a+ia\tan(c+dx))^3} +$$

$$= \frac{2e\sin(c+dx)}{33a^4d\sqrt{e\sec(c+dx)}} + \frac{2i\sqrt{e\sec(c+dx)}}{15d(a+ia\tan(c+dx))^4} + \frac{14i\sqrt{e\sec(c+dx)}}{165ad(a+ia\tan(c+dx))^3} +$$

$$= \frac{2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\sec(c+dx)}}{33a^4d} + \frac{2e\sin(c+dx)}{33a^4d\sqrt{e\sec(c+dx)}} + \frac{2i}{15d(a}$$

Mathematica [A] time = 0.63, size = 137, normalized size = 0.72

$$\frac{\sec^4(c+dx)\sqrt{e\sec(c+dx)}\,\big(i(54i\sin(2(c+dx))+37i\sin(4(c+dx))+112\cos(2(c+dx))+48\cos(4(c+dx))}{660a^4d(\tan(c+dx)-i)^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Sec[c + d*x]]/(a + I*a*Tan[c + d*x])^4,x]
```

```
[Out] (Sec[c + d*x]^4*Sqrt[e*Sec[c + d*x]]*(40*Sqrt[Cos[c + d*x]]*EllipticF[(c +
d*x)/2, 2]*(Cos[4*(c + d*x)] + I*Sin[4*(c + d*x)]) + I*(64 + 112*Cos[2*(c +
 d*x)] + 48*Cos[4*(c + d*x)] + (54*I)*Sin[2*(c + d*x)] + (37*I)*Sin[4*(c +
d*x)])))/(660*a^4*d*(-I + Tan[c + d*x])^4)
```

fricas [F] time = 1.15, size = 0, normalized size = 0.00

$$\frac{\left(1320\,a^4de^{(8i\,dx+8i\,c)}\mathrm{integral}\left(-\frac{i\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{33\,a^4d},x\right)+\sqrt{2}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(85i\,e^{(8i\,dx+8i\,c)}+166i\,e^{(6i\,dx+6i\,c}\right.\right.}{1320\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="fricas")
```

```
[Out] 1/1320*(1320*a^4*d*e^(8*I*d*x + 8*I*c)*integral(-1/33*I*sqrt(2)*sqrt(e/(e^(
2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(a^4*d), x) + sqrt(2)*sqrt(
```

```
e/(e^(2*I*d*x + 2*I*c) + 1))*(85*I*e^(8*I*d*x + 8*I*c) + 166*I*e^(6*I*d*x +
 6*I*c) + 128*I*e^(4*I*d*x + 4*I*c) + 58*I*e^(2*I*d*x + 2*I*c) + 11*I)*e^(1
/2*I*d*x + 1/2*I*c))*e^(-8*I*d*x - 8*I*c)/(a^4*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e \sec(dx + c)}}{(i a \tan(dx + c) + a)^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*sec(d*x + c))/(I*a*tan(d*x + c) + a)^4, x)
```

maple [A] time = 1.36, size = 252, normalized size = 1.32

$$2\sqrt{\frac{e}{\cos(dx+c)}}\,(-1+\cos(dx+c))^2(1+\cos(dx+c))^2\left(88i\left(\cos^8(dx+c)\right)+88\sin(dx+c)\left(\cos^7(dx+c)\right)-60i\,(c$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^4,x)
```

```
[Out] 2/165/a^4/d*(e/cos(d*x+c))^(1/2)*(-1+cos(d*x+c))^2*(1+cos(d*x+c))^2*(88*I*c
os(d*x+c)^8+88*sin(d*x+c)*cos(d*x+c)^7-60*I*cos(d*x+c)^6-16*cos(d*x+c)^5*si
n(d*x+c)+5*I*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*Ell
ipticF(I*(-1+cos(d*x+c))/sin(d*x+c),I)*cos(d*x+c)+5*I*(1/(1+cos(d*x+c)))^(1
/2)*(cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*EllipticF(I*(-1+cos(d*x+c))/sin(d*x+c
),I)+3*cos(d*x+c)^3*sin(d*x+c)+5*cos(d*x+c)*sin(d*x+c))/sin(d*x+c)^4
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^4,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{\frac{e}{\cos(c+d\,x)}}}{(a + a\tan(c + d\,x)\,1\mathrm{i})^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(1/2)/(a + a*tan(c + d*x)*1i)^4,x)
```

```
[Out] int((e/cos(c + d*x))^(1/2)/(a + a*tan(c + d*x)*1i)^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\sqrt{e \sec(c+dx)}}{\tan^4(c+dx) - 4i\tan^3(c+dx) - 6\tan^2(c+dx) + 4i\tan(c+dx) + 1}\, dx}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(1/2)/(a+I*a*tan(d*x+c))**4,x)
```

```
[Out] Integral(sqrt(e*sec(c + d*x))/(tan(c + d*x)**4 - 4*I*tan(c + d*x)**3 - 6*ta
n(c + d*x)**2 + 4*I*tan(c + d*x) + 1), x)/a**4
```

3.263 $\int (d\sec(e+fx))^{5/3}(a+ia\tan(e+fx))\,dx$

Optimal. Leaf size=69

$$\frac{6i2^{5/6}a(d\sec(e+fx))^{5/3}\,{}_2F_1\left(-\frac{5}{6},\frac{5}{6};\frac{11}{6};\frac{1}{2}(1-i\tan(e+fx))\right)}{5f(1+i\tan(e+fx))^{5/6}}$$

```
[Out] 6/5*I*2^(5/6)*a*hypergeom([-5/6, 5/6],[11/6],1/2-1/2*I*tan(f*x+e))*(d*sec(f
*x+e))^(5/3)/f/(1+I*tan(f*x+e))^(5/6)
```

Rubi [A] time = 0.17, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3505, 3523, 70, 69}

$$\frac{6i2^{5/6}a(d\sec(e+fx))^{5/3}\text{Hypergeometric2F1}\left(-\frac{5}{6},\frac{5}{6},\frac{11}{6},\frac{1}{2}(1-i\tan(e+fx))\right)}{5f(1+i\tan(e+fx))^{5/6}}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(5/3)*(a + I*a*Tan[e + f*x]),x]
```

```
[Out] (((6*I)/5)*2^(5/6)*a*Hypergeometric2F1[-5/6, 5/6, 11/6, (1 - I*Tan[e + f*x]
)/2]*(d*Sec[e + f*x])^(5/3))/(f*(1 + I*Tan[e + f*x])^(5/6))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (d\sec(e+fx))^{5/3}(a+ia\tan(e+fx))\,dx = \frac{(d\sec(e+fx))^{5/3}\int (a-ia\tan(e+fx))^{5/6}(a+ia\tan(e+fx))^{11/6}\,dx}{(a-ia\tan(e+fx))^{5/6}(a+ia\tan(e+fx))^{5/6}}$$
$$= \frac{\left(a^2(d\sec(e+fx))^{5/3}\right)\text{Subst}\left(\int \frac{(a+iax)^{5/6}}{\sqrt[6]{a-iax}}\,dx, x, \tan(e+fx)\right)}{f(a-ia\tan(e+fx))^{5/6}(a+ia\tan(e+fx))^{5/6}}$$
$$= \frac{\left(2^{5/6}a^2(d\sec(e+fx))^{5/3}\right)\text{Subst}\left(\int \frac{\left(\frac{1}{2}+\frac{ix}{2}\right)^{5/6}}{\sqrt[6]{a-iax}}\,dx, x, \tan(e+fx)\right)}{f(a-ia\tan(e+fx))^{5/6}\left(\frac{a+ia\tan(e+fx)}{a}\right)^{5/6}}$$
$$= \frac{6i2^{5/6}a\,{}_2F_1\left(-\frac{5}{6},\frac{5}{6};\frac{11}{6};\frac{1}{2}(1-i\tan(e+fx))\right)(d\sec(e+fx))^{5/3}}{5f(1+i\tan(e+fx))^{5/6}}$$

Mathematica [A] time = 1.27, size = 104, normalized size = 1.51

$$\frac{3ade^{-2ifx}(d\sec(e+fx))^{2/3}\left(i\left(1+e^{2i(e+fx)}\right)^{2/3}{}_2F_1\left(\frac{2}{3},\frac{5}{6};\frac{11}{6};-e^{2i(e+fx)}\right)+2\tan(e+fx)-3i\right)(\cos(e+3fx)+i\sin(}{10f}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(5/3)*(a + I*a*Tan[e + f*x]),x]
```

```
[Out] (3*a*d*(d*Sec[e + f*x])^(2/3)*(Cos[e + 3*f*x] + I*Sin[e + 3*f*x])*(-3*I + I
*(1 + E^((2*I)*(e + f*x)))^(2/3)*Hypergeometric2F1[2/3, 5/6, 11/6, -E^((2*I
)*(e + f*x))] + 2*Tan[e + f*x]))/(10*E^((2*I)*f*x)*f)
```

fricas [F] time = 0.98, size = 0, normalized size = 0.00

$$\frac{2^{\frac{2}{3}}\left(-15i\,ade^{\left(3i\,fx+3i\,e\right)}-3i\,ade^{\left(i\,fx+i\,e\right)}\right)\left(\frac{d}{e^{\left(2i\,fx+2i\,e\right)}+1}\right)^{\frac{2}{3}}e^{\left(\frac{2}{3}i\,fx+\frac{2}{3}i\,e\right)}+10\left(fe^{\left(2i\,fx+2i\,e\right)}+f\right)\text{integral}\left(\frac{i\cdot 2^{\frac{2}{3}}ad\left(\frac{d}{e^{\left(2i\,fx+2i\,e\right)}+1}\right.}{2f}\right.}{10\left(fe^{\left(2i\,fx+2i\,e\right)}+f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)*(a+I*a*tan(f*x+e)),x, algorithm="fricas")
```

```
[Out] 1/10*(2^(2/3)*(-15*I*a*d*e^(3*I*f*x + 3*I*e) - 3*I*a*d*e^(I*f*x + I*e))*(d/
(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*e^(2/3*I*f*x + 2/3*I*e) + 10*(f*e^(2*I*f*x
 + 2*I*e) + f)*integral(1/2*I*2^(2/3)*a*d*(d/(e^(2*I*f*x + 2*I*e) + 1))^(2/
3)*e^(2/3*I*f*x + 2/3*I*e)/f, x))/(f*e^(2*I*f*x + 2*I*e) + f)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}\left(i\,a\tan\left(fx+e\right)+a\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)*(a+I*a*tan(f*x+e)),x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(5/3)*(I*a*tan(f*x + e) + a), x)
```

maple [F] time = 0.58, size = 0, normalized size = 0.00

$$\int \left(d \sec \left(f x+e\right)\right)^{\frac{5}{3}} \left(a+i a \tan \left(f x+e\right)\right) d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(5/3)*(a+I*a*tan(f*x+e)),x)
```

```
[Out] int((d*sec(f*x+e))^(5/3)*(a+I*a*tan(f*x+e)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d \sec \left(f x+e\right)\right)^{\frac{5}{3}} \left(i a \tan \left(f x+e\right)+a\right) d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)*(a+I*a*tan(f*x+e)),x, algorithm="maxima")
```

```
[Out] integrate((d*sec(f*x + e))^(5/3)*(I*a*tan(f*x + e) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(\frac{d}{\cos \left(e+f\,x\right)}\right)}^{5/3}\,\left(a+a\,\tan \left(e+f\,x\right)\,1{}\mathrm{i}\right) \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(5/3)*(a + a*tan(e + f*x)*1i),x)
```

```
[Out] int((d/cos(e + f*x))^(5/3)*(a + a*tan(e + f*x)*1i), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(5/3)*(a+I*a*tan(f*x+e)),x)
```

```
[Out] Timed out
```

3.264 $\int \sqrt[3]{d\sec(e+fx)}\,(a+ia\tan(e+fx))\,dx$

Optimal. Leaf size=67

$$\frac{6i\sqrt[6]{2}\,a\sqrt[3]{d\sec(e+fx)}\;{}_2F_1\left(-\frac{1}{6},\frac{1}{6};\frac{7}{6};\frac{1}{2}(1-i\tan(e+fx))\right)}{f\sqrt[6]{1+i\tan(e+fx)}}$$

```
[Out] 6*I*2^(1/6)*a*hypergeom([-1/6, 1/6],[7/6],1/2-1/2*I*tan(f*x+e))*(d*sec(f*x+
e))^(1/3)/f/(1+I*tan(f*x+e))^(1/6)
```

Rubi [A] time = 0.15, antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {3505, 3523, 70, 69}

$$\frac{6i\sqrt[6]{2}\,a\sqrt[3]{d\sec(e+fx)}\,\text{Hypergeometric2F1}\left(-\frac{1}{6},\frac{1}{6},\frac{7}{6},\frac{1}{2}(1-i\tan(e+fx))\right)}{f\sqrt[6]{1+i\tan(e+fx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(1/3)*(a + I*a*Tan[e + f*x]),x]
```

```
[Out] ((6*I)*2^(1/6)*a*Hypergeometric2F1[-1/6, 1/6, 7/6, (1 - I*Tan[e + f*x])/2]*
(d*Sec[e + f*x])^(1/3))/(f*(1 + I*Tan[e + f*x])^(1/6))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \sqrt[3]{d\sec(e+fx)}\,(a+ia\tan(e+fx))\,dx = \frac{\sqrt[3]{d\sec(e+fx)}\int \sqrt[6]{a-ia\tan(e+fx)}\,(a+ia\tan(e+fx))^{7/6}\,dx}{\sqrt[6]{a-ia\tan(e+fx)}\,\sqrt[6]{a+ia\tan(e+fx)}}$$

$$= \frac{\left(a^2\sqrt[3]{d\sec(e+fx)}\right)\text{Subst}\left(\int \frac{\sqrt[6]{a+iax}}{(a-iax)^{5/6}}\,dx,x,\tan(e+fx)\right)}{f\sqrt[6]{a-ia\tan(e+fx)}\,\sqrt[6]{a+ia\tan(e+fx)}}$$

$$= \frac{\left(\sqrt[6]{2}\,a^2\sqrt[3]{d\sec(e+fx)}\right)\text{Subst}\left(\int \frac{\sqrt[6]{\frac{1}{2}+\frac{ix}{2}}}{(a-iax)^{5/6}}\,dx,x,\tan(e+fx)\right)}{f\sqrt[6]{a-ia\tan(e+fx)}\,\sqrt[6]{\frac{a+ia\tan(e+fx)}{a}}}$$

$$= \frac{6i\sqrt[6]{2}\,a\,{}_2F_1\left(-\frac{1}{6},\frac{1}{6};\frac{7}{6};\frac{1}{2}(1-i\tan(e+fx))\right)\sqrt[3]{d\sec(e+fx)}}{f\sqrt[6]{1+i\tan(e+fx)}}$$

Mathematica [**A**] time = 0.60, size = 92, normalized size = 1.37

$$\frac{3ade^{-ie}\left(-1+\sqrt[3]{1+e^{2i(e+fx)}}\,{}_2F_1\left(\frac{1}{6},\frac{1}{3};\frac{7}{6};-e^{2i(e+fx)}\right)\right)(\tan(e+fx)-i)(\cos(fx)-i\sin(fx))}{f(d\sec(e+fx))^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(1/3)*(a + I*a*Tan[e + f*x]),x]
```

```
[Out] (3*a*d*(-1 + (1 + E^((2*I)*(e + f*x)))^(1/3)*Hypergeometric2F1[1/6, 1/3, 7/
6, -E^((2*I)*(e + f*x))])*(Cos[f*x] - I*Sin[f*x])*(-I + Tan[e + f*x]))/(E^(
I*e)*f*(d*Sec[e + f*x])^(2/3))
```

fricas [**F**] time = 0.71, size = 0, normalized size = 0.00

$$\frac{3i\cdot 2^{\frac{1}{3}}a\left(\frac{d}{e^{(2ifx+2ie)}+1}\right)^{\frac{1}{3}}e^{\left(\frac{1}{3}ifx+\frac{1}{3}ie\right)}+f\text{integral}\left(-\frac{i\cdot 2^{\frac{1}{3}}a\left(\frac{d}{e^{(2ifx+2ie)}+1}\right)^{\frac{1}{3}}e^{\left(-\frac{2}{3}ifx-\frac{2}{3}ie\right)}}{f},x\right)}{f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)*(a+I*a*tan(f*x+e)),x, algorithm="fricas")
```

```
[Out] (3*I*2^(1/3)*a*(d/(e^(2*I*f*x + 2*I*e) + 1))^(1/3)*e^(1/3*I*f*x + 1/3*I*e)
+ f*integral(-I*2^(1/3)*a*(d/(e^(2*I*f*x + 2*I*e) + 1))^(1/3)*e^(-2/3*I*f*x
 - 2/3*I*e)/f, x))/f
```

giac [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}\left(i\,a\tan\left(fx+e\right)+a\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)*(a+I*a*tan(f*x+e)),x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(1/3)*(I*a*tan(f*x + e) + a), x)
```

maple [**F**] time = 0.59, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}\left(a+ia\tan\left(fx+e\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(1/3)*(a+I*a*tan(f*x+e)),x)
```

```
[Out] int((d*sec(f*x+e))^(1/3)*(a+I*a*tan(f*x+e)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d \sec\left(fx+e\right)\right)^{\frac{1}{3}} \left(i\, a \tan\left(fx+e\right) + a\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)*(a+I*a*tan(f*x+e)),x, algorithm="maxima")
```

```
[Out] integrate((d*sec(f*x + e))^(1/3)*(I*a*tan(f*x + e) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{1/3}\,\left(a+a\,\tan\left(e+f\,x\right)\,1{}\mathrm{i}\right) \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(1/3)*(a + a*tan(e + f*x)*1i),x)
```

```
[Out] int((d/cos(e + f*x))^(1/3)*(a + a*tan(e + f*x)*1i), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$ia \left(\int \left(- i \sqrt[3]{d \sec\left(e + f x\right)}\right)\, dx + \int \sqrt[3]{d \sec\left(e + f x\right)} \tan\left(e + f x\right)\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(1/3)*(a+I*a*tan(f*x+e)),x)
```

```
[Out] I*a*(Integral(-I*(d*sec(e + f*x))**(1/3), x) + Integral((d*sec(e + f*x))**(
1/3)*tan(e + f*x), x))
```

3.265 $\int \frac{a+ia\tan(e+fx)}{\sqrt[3]{d\sec(e+fx)}}\,dx$

Optimal. Leaf size=67

$$-\frac{3i2^{5/6}a\sqrt[6]{1+i\tan(e+fx)}\;{}_2F_1\left(-\frac{1}{6},\frac{1}{6};\frac{5}{6};\frac{1}{2}(1-i\tan(e+fx))\right)}{f\sqrt[3]{d\sec(e+fx)}}$$

```
[Out] -3*I*2^(5/6)*a*hypergeom([-1/6, 1/6],[5/6],1/2-1/2*I*tan(f*x+e))*(1+I*tan(f
*x+e))^(1/6)/f/(d*sec(f*x+e))^(1/3)
```

Rubi [A] time = 0.15, antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3505, 3523, 70, 69}

$$-\frac{3i2^{5/6}a\sqrt[6]{1+i\tan(e+fx)}\,\text{Hypergeometric2F1}\left(-\frac{1}{6},\frac{1}{6},\frac{5}{6},\frac{1}{2}(1-i\tan(e+fx))\right)}{f\sqrt[3]{d\sec(e+fx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[e + f*x])/(d*Sec[e + f*x])^(1/3),x]
```

```
[Out] ((-3*I)*2^(5/6)*a*Hypergeometric2F1[-1/6, 1/6, 5/6, (1 - I*Tan[e + f*x])/2]
*(1 + I*Tan[e + f*x])^(1/6))/(f*(d*Sec[e + f*x])^(1/3))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{a+ia\tan(e+fx)}{\sqrt[3]{d\sec(e+fx)}}\,dx = \frac{\left(\sqrt[6]{a-ia\tan(e+fx)}\,\sqrt[6]{a+ia\tan(e+fx)}\right)\int \frac{(a+ia\tan(e+fx))^{5/6}}{\sqrt[6]{a-ia\tan(e+fx)}}\,dx}{\sqrt[3]{d\sec(e+fx)}}$$

$$= \frac{\left(a^2\sqrt[6]{a-ia\tan(e+fx)}\,\sqrt[6]{a+ia\tan(e+fx)}\right)\text{Subst}\left(\int \frac{1}{(a-iax)^{7/6}\sqrt[6]{a+iax}}\,dx,x,\tan(e+fx\right.}{f\sqrt[3]{d\sec(e+fx)}}$$

$$= \frac{\left(a^2\sqrt[6]{a-ia\tan(e+fx)}\,\sqrt[6]{\frac{a+ia\tan(e+fx)}{a}}\right)\text{Subst}\left(\int \frac{1}{\sqrt[6]{\frac{1}{2}+\frac{ix}{2}}\,(a-iax)^{7/6}}\,dx,x,\tan(e+fx)\right)}{\sqrt[6]{2}\,f\sqrt[3]{d\sec(e+fx)}}$$

$$= -\frac{3i2^{5/6}a\,{}_2F_1\left(-\frac{1}{6},\frac{1}{6};\frac{5}{6};\frac{1}{2}(1-i\tan(e+fx))\right)\sqrt[6]{1+i\tan(e+fx)}}{f\sqrt[3]{d\sec(e+fx)}}$$

Mathematica [A] time = 0.47, size = 98, normalized size = 1.46

$$-\frac{3i2^{2/3}ae^{2i(e+fx)}\,{}_2F_1\left(\frac{2}{3},\frac{5}{6};\frac{11}{6};-e^{2i(e+fx)}\right)}{5f\sqrt[3]{1+e^{2i(e+fx)}}\sqrt[3]{\frac{de^{i(e+fx)}}{1+e^{2i(e+fx)}}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[e + f*x])/(d*Sec[e + f*x])^(1/3),x]
```

```
[Out] (((-3*I)/5)*2^(2/3)*a*E^((2*I)*(e + f*x))*Hypergeometric2F1[2/3, 5/6, 11/6,
 -E^((2*I)*(e + f*x))])/(((d*E^(I*(e + f*x)))/(1 + E^((2*I)*(e + f*x))))^(1
/3)*(1 + E^((2*I)*(e + f*x)))^(1/3)*f)
```

fricas [F] time = 0.66, size = 0, normalized size = 0.00

$$\frac{2^{\frac{2}{3}}\left(-3i\,ae^{\left(2i\,fx+2i\,e\right)}-3i\,a\right)\left(\frac{d}{e^{\left(2i\,fx+2i\,e\right)}+1}\right)^{\frac{2}{3}}e^{\left(\frac{2}{3}i\,fx+\frac{2}{3}i\,e\right)}+\left(dfe^{\left(i\,fx+i\,e\right)}-df\right)\text{integral}\left(\frac{2^{\frac{2}{3}}\left(-2i\,ae^{\left(2i\,fx+2i\,e\right)}-2i\,ae^{\left(i\,fx+i\,e\right)}-2i\,a\right)\left(\right.}{dfe^{\left(3i\,fx+3i\,e\right)}-2\,dfe^{\left(2i\,fx+2\right.}}\right.}{dfe^{\left(i\,fx+i\,e\right)}-df}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(f*x+e))/(d*sec(f*x+e))^(1/3),x, algorithm="fricas")
```

```
[Out] (2^(2/3)*(-3*I*a*e^(2*I*f*x + 2*I*e) - 3*I*a)*(d/(e^(2*I*f*x + 2*I*e) + 1))
^(2/3)*e^(2/3*I*f*x + 2/3*I*e) + (d*f*e^(I*f*x + I*e) - d*f)*integral(2^(2/
3)*(-2*I*a*e^(2*I*f*x + 2*I*e) - 2*I*a*e^(I*f*x + I*e) - 2*I*a)*(d/(e^(2*I*
f*x + 2*I*e) + 1))^(2/3)*e^(2/3*I*f*x + 2/3*I*e)/(d*f*e^(3*I*f*x + 3*I*e) -
 2*d*f*e^(2*I*f*x + 2*I*e) + d*f*e^(I*f*x + I*e)), x))/(d*f*e^(I*f*x + I*e)
 - d*f)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{i\,a\tan\left(fx+e\right)+a}{\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(f*x+e))/(d*sec(f*x+e))^(1/3),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(f*x + e) + a)/(d*sec(f*x + e))^(1/3), x)
```

maple [F] time = 0.59, size = 0, normalized size = 0.00

$$\int \frac{a + ia \tan\left(fx + e\right)}{\left(d \sec\left(fx + e\right)\right)^{\frac{1}{3}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(f*x+e))/(d*sec(f*x+e))^(1/3),x)
```

```
[Out] int((a+I*a*tan(f*x+e))/(d*sec(f*x+e))^(1/3),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{i\,a \tan\left(fx + e\right) + a}{\left(d \sec\left(fx + e\right)\right)^{\frac{1}{3}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(f*x+e))/(d*sec(f*x+e))^(1/3),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(f*x + e) + a)/(d*sec(f*x + e))^(1/3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + a \tan\left(e + f\,x\right)\,1\mathrm{i}}{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{1/3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(e + f*x)*1i)/(d/cos(e + f*x))^(1/3),x)
```

```
[Out] int((a + a*tan(e + f*x)*1i)/(d/cos(e + f*x))^(1/3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$ia \left(\int \left(- \frac{i}{\sqrt[3]{d \sec\left(e + fx\right)}}\right)\, dx + \int \frac{\tan\left(e + fx\right)}{\sqrt[3]{d \sec\left(e + fx\right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(f*x+e))/(d*sec(f*x+e))**(1/3),x)
```

```
[Out] I*a*(Integral(-I/(d*sec(e + f*x))**(1/3), x) + Integral(tan(e + f*x)/(d*sec
(e + f*x))**(1/3), x))
```

3.266 $\int \frac{a+ia\tan(e+fx)}{(d\sec(e+fx))^{5/3}}\,dx$

Optimal. Leaf size=69

$$-\frac{3i\sqrt[6]{2}\,a(1+i\tan(e+fx))^{5/6}\,{}_2F_1\left(-\frac{5}{6},\frac{5}{6};\frac{1}{6};\frac{1}{2}(1-i\tan(e+fx))\right)}{5f(d\sec(e+fx))^{5/3}}$$

```
[Out] -3/5*I*2^(1/6)*a*hypergeom([-5/6, 5/6],[1/6],1/2-1/2*I*tan(f*x+e))*(1+I*tan
(f*x+e))^(5/6)/f/(d*sec(f*x+e))^(5/3)
```

Rubi [A] time = 0.15, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {3505, 3523, 70, 69}

$$-\frac{3i\sqrt[6]{2}\,a(1+i\tan(e+fx))^{5/6}\text{Hypergeometric2F1}\left(-\frac{5}{6},\frac{5}{6},\frac{1}{6},\frac{1}{2}(1-i\tan(e+fx))\right)}{5f(d\sec(e+fx))^{5/3}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[e + f*x])/(d*Sec[e + f*x])^(5/3),x]
```

```
[Out] (((-3*I)/5)*2^(1/6)*a*Hypergeometric2F1[-5/6, 5/6, 1/6, (1 - I*Tan[e + f*x]
)/2]*(1 + I*Tan[e + f*x])^(5/6))/(f*(d*Sec[e + f*x])^(5/3))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{a+ia\tan(e+fx)}{(d\sec(e+fx))^{5/3}}\,dx = \frac{\left((a-ia\tan(e+fx))^{5/6}(a+ia\tan(e+fx))^{5/6}\right)\int \frac{\sqrt[6]{a+ia\tan(e+fx)}}{(a-ia\tan(e+fx))^{5/6}}\,dx}{(d\sec(e+fx))^{5/3}}$$

$$= \frac{\left(a^2(a-ia\tan(e+fx))^{5/6}(a+ia\tan(e+fx))^{5/6}\right)\text{Subst}\left(\int \frac{1}{(a-iax)^{11/6}(a+iax)^{5/6}}\,dx,x,\text{ta}\right.}{f(d\sec(e+fx))^{5/3}}$$

$$= \frac{\left(a^2(a-ia\tan(e+fx))^{5/6}\left(\frac{a+ia\tan(e+fx)}{a}\right)^{5/6}\right)\text{Subst}\left(\int \frac{1}{\left(\frac{1}{2}+\frac{ix}{2}\right)^{5/6}(a-iax)^{11/6}}\,dx,x,\tan(e\right.}{2^{5/6}f(d\sec(e+fx))^{5/3}}$$

$$= -\frac{3i\sqrt[6]{2}\,a\,{}_2F_1\left(-\frac{5}{6},\frac{5}{6};\frac{1}{6};\frac{1}{2}(1-i\tan(e+fx))\right)(1+i\tan(e+fx))^{5/6}}{5f(d\sec(e+fx))^{5/3}}$$

Mathematica [A] time = 0.48, size = 106, normalized size = 1.54

$$-\frac{3iae^{i(e+fx)}\left(4\sqrt[3]{1+e^{2i(e+fx)}}\,{}_2F_1\left(\frac{1}{6},\frac{1}{3};\frac{7}{6};-e^{2i(e+fx)}\right)+e^{2i(e+fx)}+1\right)}{5df\left(1+e^{2i(e+fx)}\right)(d\sec(e+fx))^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[e + f*x])/(d*Sec[e + f*x])^(5/3),x]
```

```
[Out] (((-3*I)/5)*a*E^(I*(e + f*x))*(1 + E^((2*I)*(e + f*x)) + 4*(1 + E^((2*I)*(e
 + f*x)))^(1/3)*Hypergeometric2F1[1/6, 1/3, 7/6, -E^((2*I)*(e + f*x))]))/(d
*(1 + E^((2*I)*(e + f*x)))*f*(d*Sec[e + f*x])^(2/3))
```

fricas [F] time = 0.69, size = 0, normalized size = 0.00

$$\frac{10\,d^2f\text{integral}\left(-\frac{2i\cdot 2^{\frac{1}{3}}a\left(\frac{d}{e^{(2ifx+2ie)}+1}\right)^{\frac{1}{3}}e^{\left(-\frac{2}{3}ifx-\frac{2}{3}ie\right)}}{5d^2f},x\right)+2^{\frac{1}{3}}\left(-3iae^{(2ifx+2ie)}-3ia\right)\left(\frac{d}{e^{(2ifx+2ie)}+1}\right)^{\frac{1}{3}}e^{\left(\frac{1}{3}ifx+\frac{1}{3}ie\right)}}{10\,d^2f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(f*x+e))/(d*sec(f*x+e))^(5/3),x, algorithm="fricas")
```

```
[Out] 1/10*(10*d^2*f*integral(-2/5*I*2^(1/3)*a*(d/(e^(2*I*f*x + 2*I*e) + 1))^(1/3
)*e^(-2/3*I*f*x - 2/3*I*e)/(d^2*f), x) + 2^(1/3)*(-3*I*a*e^(2*I*f*x + 2*I*e
) - 3*I*a)*(d/(e^(2*I*f*x + 2*I*e) + 1))^(1/3)*e^(1/3*I*f*x + 1/3*I*e))/(d^
2*f)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{ia\tan\left(fx+e\right)+a}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(f*x+e))/(d*sec(f*x+e))^(5/3),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(f*x + e) + a)/(d*sec(f*x + e))^(5/3), x)
```

maple [F] time = 0.62, size = 0, normalized size = 0.00

$$\int \frac{a+ia\tan\left(fx+e\right)}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(f*x+e))/(d*sec(f*x+e))^(5/3),x)
[Out] int((a+I*a*tan(f*x+e))/(d*sec(f*x+e))^(5/3),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{i\,a\tan\left(fx+e\right)+a}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(f*x+e))/(d*sec(f*x+e))^(5/3),x, algorithm="maxima")
[Out] integrate((I*a*tan(f*x + e) + a)/(d*sec(f*x + e))^(5/3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+a\tan\left(e+f\,x\right)\,1{}\mathrm{i}}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{5/3}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(e + f*x)*1i)/(d/cos(e + f*x))^(5/3),x)
[Out] int((a + a*tan(e + f*x)*1i)/(d/cos(e + f*x))^(5/3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$ia\left(\int \left(-\frac{i}{\left(d\sec\left(e+fx\right)\right)^{\frac{5}{3}}}\right)dx+\int \frac{\tan\left(e+fx\right)}{\left(d\sec\left(e+fx\right)\right)^{\frac{5}{3}}}dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(f*x+e))/(d*sec(f*x+e))**(5/3),x)
[Out] I*a*(Integral(-I/(d*sec(e + f*x))**(5/3), x) + Integral(tan(e + f*x)/(d*sec
(e + f*x))**(5/3), x))
```

3.267 $\int (d\sec(e+fx))^{5/3}(a+ia\tan(e+fx))^2\,dx$

Optimal. Leaf size=71

$$\frac{12i2^{5/6}a^2(d\sec(e+fx))^{5/3}\,{}_2F_1\left(-\frac{11}{6},\frac{5}{6};\frac{11}{6};\frac{1}{2}(1-i\tan(e+fx))\right)}{5f(1+i\tan(e+fx))^{5/6}}$$

```
[Out] 12/5*I*2^(5/6)*a^2*hypergeom([-11/6, 5/6],[11/6],1/2-1/2*I*tan(f*x+e))*(d*s
ec(f*x+e))^(5/3)/f/(1+I*tan(f*x+e))^(5/6)
```

Rubi [A] time = 0.18, antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3505, 3523, 70, 69}

$$\frac{12i2^{5/6}a^2(d\sec(e+fx))^{5/3}\text{Hypergeometric2F1}\left(-\frac{11}{6},\frac{5}{6},\frac{11}{6},\frac{1}{2}(1-i\tan(e+fx))\right)}{5f(1+i\tan(e+fx))^{5/6}}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(5/3)*(a + I*a*Tan[e + f*x])^2,x]
```

```
[Out] (((12*I)/5)*2^(5/6)*a^2*Hypergeometric2F1[-11/6, 5/6, 11/6, (1 - I*Tan[e +
f*x])/2]*(d*Sec[e + f*x])^(5/3))/(f*(1 + I*Tan[e + f*x])^(5/6))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (d\sec(e+fx))^{5/3}(a+ia\tan(e+fx))^2\,dx = \frac{(d\sec(e+fx))^{5/3}\int (a-ia\tan(e+fx))^{5/6}(a+ia\tan(e+fx))^{17/6}\,dx}{(a-ia\tan(e+fx))^{5/6}(a+ia\tan(e+fx))^{5/6}}$$

$$= \frac{\left(a^2(d\sec(e+fx))^{5/3}\right)\text{Subst}\left(\int \frac{(a+iax)^{11/6}}{\sqrt[6]{a-iax}}\,dx, x, \tan(e+fx)\right)}{f(a-ia\tan(e+fx))^{5/6}(a+ia\tan(e+fx))^{5/6}}$$

$$= \frac{\left(2\, 2^{5/6}a^3(d\sec(e+fx))^{5/3}\right)\text{Subst}\left(\int \frac{\left(\frac{1}{2}+\frac{ix}{2}\right)^{11/6}}{\sqrt[6]{a-iax}}\,dx, x, \tan(e+fx)\right)}{f(a-ia\tan(e+fx))^{5/6}\left(\frac{a+ia\tan(e+fx)}{a}\right)^{5/6}}$$

$$= \frac{12i2^{5/6}a^2\,{}_2F_1\left(-\frac{11}{6},\frac{5}{6};\frac{11}{6};\frac{1}{2}(1-i\tan(e+fx))\right)(d\sec(e+fx))^{5/3}}{5f(1+i\tan(e+fx))^{5/6}}$$

Mathematica [B] time = 2.82, size = 267, normalized size = 3.76

$$\frac{(a+ia\tan(e+fx))^2(d\sec(e+fx))^{5/3}\left(\frac{3}{4}\csc(e)(\cos(2e)-i\sin(2e))\sec^{\frac{8}{3}}(e+fx)(64i\sin(2e+fx)+75\cos(2e+\ldots\right.}{80f\sec^{\frac{11}{3}}(e+fx)(\cos(f\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(5/3)*(a + I*a*Tan[e + f*x])^2,x]
```

```
[Out] ((d*Sec[e + f*x])^(5/3)*(((-33*I)*2^(2/3)*(5*(1 + E^((2*I)*(e + f*x)))^(1/3
) - E^((2*I)*f*x)*(-1 + E^((2*I)*e))*Hypergeometric2F1[2/3, 5/6, 11/6, -E^(
(2*I)*(e + f*x))]))/((-1 + E^((2*I)*e))*(E^(I*(e + f*x))/(1 + E^((2*I)*(e +
 f*x))))^(1/3)*(1 + E^((2*I)*(e + f*x)))^(1/3)) + (3*Csc[e]*Sec[e + f*x]^(8
/3)*(Cos[2*e] - I*Sin[2*e])*(90*Cos[f*x] + 75*Cos[2*e + f*x] + 55*Cos[2*e +
 3*f*x] - (64*I)*Sin[f*x] + (64*I)*Sin[2*e + f*x]))/4)*(a + I*a*Tan[e + f*x
])^2)/(80*f*Sec[e + f*x]^(11/3)*(Cos[f*x] + I*Sin[f*x])^2)
```

fricas [F] time = 0.59, size = 0, normalized size = 0.00

$$\frac{2^{\frac{2}{3}}\left(-165i\,a^2de^{(5i\,fx+5i\,e)}-78i\,a^2de^{(3i\,fx+3i\,e)}-33i\,a^2de^{(i\,fx+i\,e)}\right)\left(\frac{d}{e^{(2i\,fx+2i\,e)}+1}\right)^{\frac{2}{3}}e^{\left(\frac{2}{3}i\,fx+\frac{2}{3}i\,e\right)}+80\left(fe^{(4i\,fx+4i\,e)}+2\,fe^{(\ldots}\right.}{80\left(fe^{(4i\,fx+4i\,e)}+2\,fe^{(2i\,fx+2i\,e)}+f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)*(a+I*a*tan(f*x+e))^2,x, algorithm="fricas")
```

```
[Out] 1/80*(2^(2/3)*(-165*I*a^2*d*e^(5*I*f*x + 5*I*e) - 78*I*a^2*d*e^(3*I*f*x + 3
*I*e) - 33*I*a^2*d*e^(I*f*x + I*e))*(d/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*e^(
2/3*I*f*x + 2/3*I*e) + 80*(f*e^(4*I*f*x + 4*I*e) + 2*f*e^(2*I*f*x + 2*I*e)
+ f)*integral(11/16*I*2^(2/3)*a^2*d*(d/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*e^(
2/3*I*f*x + 2/3*I*e)/f, x))/(f*e^(4*I*f*x + 4*I*e) + 2*f*e^(2*I*f*x + 2*I*e
) + f)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}\left(i\,a\tan\left(fx+e\right)+a\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)*(a+I*a*tan(f*x+e))^2,x, algorithm="giac")
[Out] integrate((d*sec(f*x + e))^(5/3)*(I*a*tan(f*x + e) + a)^2, x)
```

maple [F] time = 0.63, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}} \left(a+ia\tan\left(fx+e\right)\right)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(5/3)*(a+I*a*tan(f*x+e))^2,x)
[Out] int((d*sec(f*x+e))^(5/3)*(a+I*a*tan(f*x+e))^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}} \left(i\,a\tan\left(fx+e\right)+a\right)^{2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)*(a+I*a*tan(f*x+e))^2,x, algorithm="maxima")
[Out] integrate((d*sec(f*x + e))^(5/3)*(I*a*tan(f*x + e) + a)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{5/3}\,{\left(a+a\,\mathrm{tan}\left(e+f\,x\right)\,1{}\mathrm{i}\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(5/3)*(a + a*tan(e + f*x)*1i)^2,x)
[Out] int((d/cos(e + f*x))^(5/3)*(a + a*tan(e + f*x)*1i)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(5/3)*(a+I*a*tan(f*x+e))**2,x)
[Out] Timed out
```

3.268 $\int \sqrt[3]{d\sec(e+fx)}\,(a+ia\tan(e+fx))^2\,dx$

Optimal. Leaf size=69

$$\frac{12i\sqrt[6]{2}\,a^2\sqrt[3]{d\sec(e+fx)}\;{}_2F_1\left(-\frac{7}{6},\frac{1}{6};\frac{7}{6};\frac{1}{2}(1-i\tan(e+fx))\right)}{f\sqrt[6]{1+i\tan(e+fx)}}$$

[Out] 12*I*2^(1/6)*a^2*hypergeom([-7/6, 1/6],[7/6],1/2-1/2*I*tan(f*x+e))*(d*sec(f*x+e))^(1/3)/f/(1+I*tan(f*x+e))^(1/6)

Rubi [A] time = 0.16, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3505, 3523, 70, 69}

$$\frac{12i\sqrt[6]{2}\,a^2\sqrt[3]{d\sec(e+fx)}\,\text{Hypergeometric2F1}\left(-\frac{7}{6},\frac{1}{6},\frac{7}{6},\frac{1}{2}(1-i\tan(e+fx))\right)}{f\sqrt[6]{1+i\tan(e+fx)}}$$

Antiderivative was successfully verified.

[In] Int[(d*Sec[e + f*x])^(1/3)*(a + I*a*Tan[e + f*x])^2,x]

[Out] ((12*I)*2^(1/6)*a^2*Hypergeometric2F1[-7/6, 1/6, 7/6, (1 - I*Tan[e + f*x])/2]*(d*Sec[e + f*x])^(1/3))/(f*(1 + I*Tan[e + f*x])^(1/6))

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \sqrt[3]{d\sec(e+fx)}\,(a+ia\tan(e+fx))^2\,dx = \frac{\sqrt[3]{d\sec(e+fx)}\int \sqrt[6]{a-ia\tan(e+fx)}\,(a+ia\tan(e+fx))^{13/6}\,dx}{\sqrt[6]{a-ia\tan(e+fx)}\,\sqrt[6]{a+ia\tan(e+fx)}}$$

$$= \frac{\left(a^2\sqrt[3]{d\sec(e+fx)}\right)\mathrm{Subst}\left(\int \frac{(a+iax)^{7/6}}{(a-iax)^{5/6}}\,dx, x, \tan(e+fx)\right)}{f\sqrt[6]{a-ia\tan(e+fx)}\,\sqrt[6]{a+ia\tan(e+fx)}}$$

$$= \frac{\left(2\sqrt[6]{2}\,a^3\sqrt[3]{d\sec(e+fx)}\right)\mathrm{Subst}\left(\int \frac{\left(\frac{1}{2}+\frac{ix}{2}\right)^{7/6}}{(a-iax)^{5/6}}\,dx, x, \tan(e+fx)\right)}{f\sqrt[6]{a-ia\tan(e+fx)}\,\sqrt[6]{\frac{a+ia\tan(e+fx)}{a}}}$$

$$= \frac{12i\sqrt[6]{2}\,a^2\,{}_2F_1\left(-\frac{7}{6},\frac{1}{6};\frac{7}{6};\frac{1}{2}(1-i\tan(e+fx))\right)\sqrt[3]{d\sec(e+fx)}}{f\sqrt[6]{1+i\tan(e+fx)}}$$

Mathematica [A] time = 1.08, size = 128, normalized size = 1.86

$$-\frac{3a^2e^{-2ie}\sqrt[3]{d\sec(e+fx)}\,(\cos(2(e+fx))+i\sin(2(e+fx)))\left(7i\sqrt[3]{1+e^{2i(e+fx)}}\,{}_2F_1\left(\frac{1}{6},\frac{1}{3};\frac{7}{6};-e^{2i(e+fx)}\right)+\sec(e)\,\mathrm{s}\right.}{4f(\cos(fx)+i\sin(fx))^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(1/3)*(a + I*a*Tan[e + f*x])^2,x]
```

```
[Out] (-3*a^2*(d*Sec[e + f*x])^(1/3)*(Cos[2*(e + f*x)] + I*Sin[2*(e + f*x)])*(-8*
I + (7*I)*(1 + E^((2*I)*(e + f*x)))^(1/3)*Hypergeometric2F1[1/6, 1/3, 7/6,
-E^((2*I)*(e + f*x))] + Sec[e]*Sec[e + f*x]*Sin[f*x] + Tan[e]))/(4*E^((2*I)
*e)*f*(Cos[f*x] + I*Sin[f*x])^2)
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\frac{2^{\frac{1}{3}}\left(27i\,a^2e^{\left(2i\,fx+2i\,e\right)}+21i\,a^2\right)\left(\frac{d}{e^{\left(2i\,fx+2i\,e\right)}+1}\right)^{\frac{1}{3}}e^{\left(\frac{1}{3}i\,fx+\frac{1}{3}i\,e\right)}+4\left(fe^{\left(2i\,fx+2i\,e\right)}+f\right)\mathrm{integral}\left(-\frac{7i\cdot 2^{\frac{1}{3}}a^2\left(\frac{d}{e^{\left(2i\,fx+2i\,e\right)}+1}\right)^{\frac{1}{3}}e^{\left(-\right.}}{4f}\right.}{4\left(fe^{\left(2i\,fx+2i\,e\right)}+f\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)*(a+I*a*tan(f*x+e))^2,x, algorithm="fricas")
```

```
[Out] 1/4*(2^(1/3)*(27*I*a^2*e^(2*I*f*x + 2*I*e) + 21*I*a^2)*(d/(e^(2*I*f*x + 2*I
*e) + 1))^(1/3)*e^(1/3*I*f*x + 1/3*I*e) + 4*(f*e^(2*I*f*x + 2*I*e) + f)*int
egral(-7/4*I*2^(1/3)*a^2*(d/(e^(2*I*f*x + 2*I*e) + 1))^(1/3)*e^(-2/3*I*f*x
- 2/3*I*e)/f, x))/(f*e^(2*I*f*x + 2*I*e) + f)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}\left(i\,a\tan\left(fx+e\right)+a\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)*(a+I*a*tan(f*x+e))^2,x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(1/3)*(I*a*tan(f*x + e) + a)^2, x)
```

maple [F] time = 0.62, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}\left(a+ia\tan\left(fx+e\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(1/3)*(a+I*a*tan(f*x+e))^2,x)
[Out] int((d*sec(f*x+e))^(1/3)*(a+I*a*tan(f*x+e))^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}\left(i\,a\tan\left(fx+e\right)+a\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)*(a+I*a*tan(f*x+e))^2,x, algorithm="maxima")
[Out] integrate((d*sec(f*x + e))^(1/3)*(I*a*tan(f*x + e) + a)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{1/3}\,{\left(a+a\,\mathrm{tan}\left(e+f\,x\right)\,1{}\mathrm{i}\right)}^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(1/3)*(a + a*tan(e + f*x)*1i)^2,x)
[Out] int((d/cos(e + f*x))^(1/3)*(a + a*tan(e + f*x)*1i)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-a^{2}\left(\int\left(-\sqrt[3]{d\sec\left(e+fx\right)}\right)dx+\int\sqrt[3]{d\sec\left(e+fx\right)}\tan^{2}\left(e+fx\right)dx+\int\left(-2i\sqrt[3]{d\sec\left(e+fx\right)}\tan\left(e+fx\right)\right)d$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(1/3)*(a+I*a*tan(f*x+e))**2,x)
[Out] -a**2*(Integral(-(d*sec(e + f*x))**(1/3), x) + Integral((d*sec(e + f*x))**(
1/3)*tan(e + f*x)**2, x) + Integral(-2*I*(d*sec(e + f*x))**(1/3)*tan(e + f*
x), x))
```

3.269 $\int \frac{(a+ia\tan(e+fx))^2}{\sqrt[3]{d\sec(e+fx)}}\,dx$

Optimal. Leaf size=83

$$-\frac{6i2^{5/6}\left(a^2+ia^2\tan(e+fx)\right)\,{}_2F_1\left(-\frac{5}{6},-\frac{1}{6};\frac{5}{6};\frac{1}{2}(1-i\tan(e+fx))\right)}{f(1+i\tan(e+fx))^{5/6}\sqrt[3]{d\sec(e+fx)}}$$

```
[Out] -6*I*2^(5/6)*hypergeom([-5/6, -1/6],[5/6],1/2-1/2*I*tan(f*x+e))*(a^2+I*a^2*
tan(f*x+e))/f/(d*sec(f*x+e))^(1/3)/(1+I*tan(f*x+e))^(5/6)
```

Rubi [A] time = 0.17, antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3505, 3523, 70, 69}

$$-\frac{6i2^{5/6}\left(a^2+ia^2\tan(e+fx)\right)\text{Hypergeometric2F1}\left(-\frac{5}{6},-\frac{1}{6},\frac{5}{6},\frac{1}{2}(1-i\tan(e+fx))\right)}{f(1+i\tan(e+fx))^{5/6}\sqrt[3]{d\sec(e+fx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[e + f*x])^2/(d*Sec[e + f*x])^(1/3),x]
```

```
[Out] ((-6*I)*2^(5/6)*Hypergeometric2F1[-5/6, -1/6, 5/6, (1 - I*Tan[e + f*x])/2]*
(a^2 + I*a^2*Tan[e + f*x]))/(f*(d*Sec[e + f*x])^(1/3)*(1 + I*Tan[e + f*x])^
(5/6))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(a+ia\tan(e+fx))^2}{\sqrt[3]{d\sec(e+fx)}}\,dx = \frac{\left(\sqrt[6]{a-ia\tan(e+fx)}\,\sqrt[6]{a+ia\tan(e+fx)}\right)\int \frac{(a+ia\tan(e+fx))^{11/6}}{\sqrt[6]{a-ia\tan(e+fx)}}\,dx}{\sqrt[3]{d\sec(e+fx)}}$$

$$= \frac{\left(a^2\sqrt[6]{a-ia\tan(e+fx)}\,\sqrt[6]{a+ia\tan(e+fx)}\right)\text{Subst}\left(\int \frac{(a+iax)^{5/6}}{(a-iax)^{7/6}}\,dx, x, \tan(e+fx)\right)}{f\sqrt[3]{d\sec(e+fx)}}$$

$$= \frac{\left(2^{5/6}a^2\sqrt[6]{a-ia\tan(e+fx)}\,(a+ia\tan(e+fx))\right)\text{Subst}\left(\int \frac{\left(\frac{1}{2}+\frac{ix}{2}\right)^{5/6}}{(a-iax)^{7/6}}\,dx, x, \tan(e+fx\right.}{f\sqrt[3]{d\sec(e+fx)}\left(\frac{a+ia\tan(e+fx)}{a}\right)^{5/6}}$$

$$= -\frac{6i2^{5/6}\,{}_2F_1\left(-\frac{5}{6},-\frac{1}{6};\frac{5}{6};\frac{1}{2}(1-i\tan(e+fx))\right)\left(a^2+ia^2\tan(e+fx)\right)}{f\sqrt[3]{d\sec(e+fx)}\,(1+i\tan(e+fx))^{5/6}}$$

Mathematica [A] time = 1.29, size = 132, normalized size = 1.59

$$-\frac{3ia^2e^{2i(e+fx)}\left(\left(1+e^{2i(e+fx)}\right){}_2F_1\left(\frac{2}{3},\frac{5}{6};\frac{11}{6};-e^{2i(e+fx)}\right)-\sqrt[3]{1+e^{2i(e+fx)}}\right)}{\sqrt[3]{2}\,f\left(1+e^{2i(e+fx)}\right)^{4/3}\sqrt[3]{\frac{de^{i(e+fx)}}{1+e^{2i(e+fx)}}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[e + f*x])^2/(d*Sec[e + f*x])^(1/3),x]
```

```
[Out] ((-3*I)*a^2*E^((2*I)*(e + f*x))*(-(1 + E^((2*I)*(e + f*x)))^(1/3) + (1 + E^
((2*I)*(e + f*x)))*Hypergeometric2F1[2/3, 5/6, 11/6, -E^((2*I)*(e + f*x))])
)/(2^(1/3)*((d*E^(I*(e + f*x)))/(1 + E^((2*I)*(e + f*x))))^(1/3)*(1 + E^((2
*I)*(e + f*x)))^(4/3)*f)
```

fricas [F] time = 0.68, size = 0, normalized size = 0.00

$$\frac{2^{\frac{2}{3}}\left(-12i\,a^2e^{\left(2i\,fx+2i\,e\right)}-3i\,a^2e^{\left(i\,fx+i\,e\right)}-15i\,a^2\right)\left(\frac{d}{e^{\left(2i\,fx+2i\,e\right)}+1}\right)^{\frac{2}{3}}e^{\left(\frac{2}{3}i\,fx+\frac{2}{3}i\,e\right)}+2\left(dfe^{\left(i\,fx+i\,e\right)}-df\right)\text{integral}\left(\frac{2^{\frac{2}{3}}\left(-5i\,a^2e^{\left(\right.}\right.}{\right.}\right.}{2\left(dfe^{\left(i\,fx+i\,e\right)}-df\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(f*x+e))^2/(d*sec(f*x+e))^(1/3),x, algorithm="fricas")
```

```
[Out] 1/2*(2^(2/3)*(-12*I*a^2*e^(2*I*f*x + 2*I*e) - 3*I*a^2*e^(I*f*x + I*e) - 15*
I*a^2)*(d/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*e^(2/3*I*f*x + 2/3*I*e) + 2*(d*f
*e^(I*f*x + I*e) - d*f)*integral(2^(2/3)*(-5*I*a^2*e^(2*I*f*x + 2*I*e) - 5*
I*a^2*e^(I*f*x + I*e) - 5*I*a^2)*(d/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*e^(2/3
*I*f*x + 2/3*I*e)/(d*f*e^(3*I*f*x + 3*I*e) - 2*d*f*e^(2*I*f*x + 2*I*e) + d*
f*e^(I*f*x + I*e)), x))/(d*f*e^(I*f*x + I*e) - d*f)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(i\,a\tan\left(fx+e\right)+a\right)^2}{\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(f*x+e))^2/(d*sec(f*x+e))^(1/3),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(f*x + e) + a)^2/(d*sec(f*x + e))^(1/3), x)
```

maple [F] time = 0.59, size = 0, normalized size = 0.00

$$\int \frac{\left(a + ia\tan\left(fx + e\right)\right)^{2}}{\left(d\sec\left(fx + e\right)\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(f*x+e))^2/(d*sec(f*x+e))^(1/3),x)
```

```
[Out] int((a+I*a*tan(f*x+e))^2/(d*sec(f*x+e))^(1/3),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(i\,a\tan\left(fx + e\right) + a\right)^{2}}{\left(d\sec\left(fx + e\right)\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(f*x+e))^2/(d*sec(f*x+e))^(1/3),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(f*x + e) + a)^2/(d*sec(f*x + e))^(1/3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(a+a\,\mathrm{tan}\left(e+f\,x\right)\,1{}\mathrm{i}\right)}^2}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{1/3}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(e + f*x)*1i)^2/(d/cos(e + f*x))^(1/3),x)
```

```
[Out] int((a + a*tan(e + f*x)*1i)^2/(d/cos(e + f*x))^(1/3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-a^{2}\left(\int\left(-\frac{1}{\sqrt[3]{d\sec\left(e + fx\right)}}\right)dx + \int\frac{\tan^{2}\left(e + fx\right)}{\sqrt[3]{d\sec\left(e + fx\right)}}\,dx + \int\left(-\frac{2i\tan\left(e + fx\right)}{\sqrt[3]{d\sec\left(e + fx\right)}}\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(f*x+e))**2/(d*sec(f*x+e))**(1/3),x)
```

```
[Out] -a**2*(Integral(-1/(d*sec(e + f*x))**(1/3), x) + Integral(tan(e + f*x)**2/(
d*sec(e + f*x))**(1/3), x) + Integral(-2*I*tan(e + f*x)/(d*sec(e + f*x))**(
1/3), x))
```

3.270 $\int \frac{(a+ia\tan(e+fx))^2}{(d\sec(e+fx))^{5/3}}\,dx$

Optimal. Leaf size=85

$$-\frac{6i\sqrt[6]{2}\left(a^2+ia^2\tan(e+fx)\right){}_2F_1\left(-\frac{5}{6},-\frac{1}{6};\frac{1}{6};\frac{1}{2}(1-i\tan(e+fx))\right)}{5f\sqrt[6]{1+i\tan(e+fx)}\,(d\sec(e+fx))^{5/3}}$$

```
[Out] -6/5*I*2^(1/6)*hypergeom([-5/6, -1/6],[1/6],1/2-1/2*I*tan(f*x+e))*(a^2+I*a^
2*tan(f*x+e))/f/(d*sec(f*x+e))^(5/3)/(1+I*tan(f*x+e))^(1/6)
```

Rubi [A] time = 0.18, antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3505, 3523, 70, 69}

$$-\frac{6i\sqrt[6]{2}\left(a^2+ia^2\tan(e+fx)\right)\text{Hypergeometric2F1}\left(-\frac{5}{6},-\frac{1}{6},\frac{1}{6},\frac{1}{2}(1-i\tan(e+fx))\right)}{5f\sqrt[6]{1+i\tan(e+fx)}\,(d\sec(e+fx))^{5/3}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[e + f*x])^2/(d*Sec[e + f*x])^(5/3),x]
```

```
[Out] (((-6*I)/5)*2^(1/6)*Hypergeometric2F1[-5/6, -1/6, 1/6, (1 - I*Tan[e + f*x])
/2]*(a^2 + I*a^2*Tan[e + f*x]))/(f*(d*Sec[e + f*x])^(5/3)*(1 + I*Tan[e + f*
x])^(1/6))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(a+ia\tan(e+fx))^2}{(d\sec(e+fx))^{5/3}}\,dx = \frac{\left((a-ia\tan(e+fx))^{5/6}(a+ia\tan(e+fx))^{5/6}\right)\int \frac{(a+ia\tan(e+fx))^{7/6}}{(a-ia\tan(e+fx))^{5/6}}\,dx}{(d\sec(e+fx))^{5/3}}$$

$$= \frac{\left(a^2(a-ia\tan(e+fx))^{5/6}(a+ia\tan(e+fx))^{5/6}\right)\text{Subst}\left(\int \frac{\sqrt[6]{a+iax}}{(a-iax)^{11/6}}\,dx, x, \tan(e -\right.}{f(d\sec(e+fx))^{5/3}}$$

$$= \frac{\left(\sqrt[6]{2}\,a^2(a-ia\tan(e+fx))^{5/6}(a+ia\tan(e+fx))\right)\text{Subst}\left(\int \frac{\sqrt[6]{\frac{1}{2}+\frac{ix}{2}}}{(a-iax)^{11/6}}\,dx, x, \tan(e\right.}{f(d\sec(e+fx))^{5/3}\sqrt[6]{\frac{a+ia\tan(e+fx)}{a}}}$$

$$= -\frac{6i\sqrt[6]{2}\,{}_2F_1\left(-\frac{5}{6},-\frac{1}{6};\frac{1}{6};\frac{1}{2}(1-i\tan(e+fx))\right)\left(a^2+ia^2\tan(e+fx)\right)}{5f(d\sec(e+fx))^{5/3}\sqrt[6]{1+i\tan(e+fx)}}$$

Mathematica [A] time = 0.73, size = 105, normalized size = 1.24

$$-\frac{12ia^2e^{2i(e+fx)}\left(-\sqrt[3]{1+e^{2i(e+fx)}}\,{}_2F_1\left(\frac{1}{6},\frac{1}{3};\frac{7}{6};-e^{2i(e+fx)}\right)+e^{2i(e+fx)}+1\right)}{5f\left(1+e^{2i(e+fx)}\right)^2(d\sec(e+fx))^{5/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[e + f*x])^2/(d*Sec[e + f*x])^(5/3),x]
```

```
[Out] (((-12*I)/5)*a^2*E^((2*I)*(e + f*x))*(1 + E^((2*I)*(e + f*x)) - (1 + E^((2*
I)*(e + f*x)))^(1/3)*Hypergeometric2F1[1/6, 1/3, 7/6, -E^((2*I)*(e + f*x))]
))/((1 + E^((2*I)*(e + f*x)))^2*f*(d*Sec[e + f*x])^(5/3))
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\frac{5\,d^2f\,\text{integral}\left(\frac{i\cdot 2^{\frac{1}{3}}a^2\left(\frac{d}{e^{(2ifx+2ie)}+1}\right)^{\frac{1}{3}}e^{\left(-\frac{2}{3}ifx-\frac{2}{3}ie\right)}}{5\,d^2f},x\right)+2^{\frac{1}{3}}\left(-3ia^2e^{(2ifx+2ie)}-3ia^2\right)\left(\frac{d}{e^{(2ifx+2ie)}+1}\right)^{\frac{1}{3}}e^{\left(\frac{1}{3}ifx+\frac{1}{3}ie\right)}}{5\,d^2f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(f*x+e))^2/(d*sec(f*x+e))^(5/3),x, algorithm="fricas")
```

```
[Out] 1/5*(5*d^2*f*integral(1/5*I*2^(1/3)*a^2*(d/(e^(2*I*f*x + 2*I*e) + 1))^(1/3)
*e^(-2/3*I*f*x - 2/3*I*e)/(d^2*f), x) + 2^(1/3)*(-3*I*a^2*e^(2*I*f*x + 2*I*
e) - 3*I*a^2)*(d/(e^(2*I*f*x + 2*I*e) + 1))^(1/3)*e^(1/3*I*f*x + 1/3*I*e))/
(d^2*f)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(ia\tan\left(fx+e\right)+a\right)^2}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(f*x+e))^2/(d*sec(f*x+e))^(5/3),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(f*x + e) + a)^2/(d*sec(f*x + e))^(5/3), x)
```

maple [F] time = 0.65, size = 0, normalized size = 0.00

$$\int \frac{\left(a+ia\tan\left(fx+e\right)\right)^{2}}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(f*x+e))^2/(d*sec(f*x+e))^(5/3),x)
```

```
[Out] int((a+I*a*tan(f*x+e))^2/(d*sec(f*x+e))^(5/3),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(i\,a\tan\left(fx+e\right)+a\right)^{2}}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(f*x+e))^2/(d*sec(f*x+e))^(5/3),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(f*x + e) + a)^2/(d*sec(f*x + e))^(5/3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+a\tan\left(e+f\,x\right)\,1\mathrm{i}\right)^{2}}{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{5/3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(e + f*x)*1i)^2/(d/cos(e + f*x))^(5/3),x)
```

```
[Out] int((a + a*tan(e + f*x)*1i)^2/(d/cos(e + f*x))^(5/3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-a^{2}\left(\int\left(-\frac{1}{\left(d\sec\left(e+fx\right)\right)^{\frac{5}{3}}}\right)dx+\int\frac{\tan^{2}\left(e+fx\right)}{\left(d\sec\left(e+fx\right)\right)^{\frac{5}{3}}}\,dx+\int\left(-\frac{2i\tan\left(e+fx\right)}{\left(d\sec\left(e+fx\right)\right)^{\frac{5}{3}}}\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(f*x+e))**2/(d*sec(f*x+e))**(5/3),x)
```

```
[Out] -a**2*(Integral(-1/(d*sec(e + f*x))**(5/3), x) + Integral(tan(e + f*x)**2/(
d*sec(e + f*x))**(5/3), x) + Integral(-2*I*tan(e + f*x)/(d*sec(e + f*x))**(
5/3), x))
```

3.271 $\int \frac{(d\sec(e+fx))^{5/3}}{a+ia\tan(e+fx)}\,dx$

Optimal. Leaf size=83

$$\frac{3i\sqrt[6]{1+i\tan(e+fx)}\,(d\sec(e+fx))^{5/3}\,{}_2F_1\left(\frac{5}{6},\frac{7}{6};\frac{11}{6};\frac{1}{2}(1-i\tan(e+fx))\right)}{5\sqrt[6]{2}\,f(a+ia\tan(e+fx))}$$

```
[Out] 3/10*I*hypergeom([5/6, 7/6],[11/6],1/2-1/2*I*tan(f*x+e))*(d*sec(f*x+e))^(5/
3)*(1+I*tan(f*x+e))^(1/6)*2^(5/6)/f/(a+I*a*tan(f*x+e))
```

Rubi [A] time = 0.18, antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3505, 3523, 70, 69}

$$\frac{3i\sqrt[6]{1+i\tan(e+fx)}\,(d\sec(e+fx))^{5/3}\text{Hypergeometric2F1}\left(\frac{5}{6},\frac{7}{6},\frac{11}{6},\frac{1}{2}(1-i\tan(e+fx))\right)}{5\sqrt[6]{2}\,f(a+ia\tan(e+fx))}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(5/3)/(a + I*a*Tan[e + f*x]),x]
```

```
[Out] (((3*I)/5)*Hypergeometric2F1[5/6, 7/6, 11/6, (1 - I*Tan[e + f*x])/2]*(d*Sec
[e + f*x])^(5/3)*(1 + I*Tan[e + f*x])^(1/6))/(2^(1/6)*f*(a + I*a*Tan[e + f*
x]))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(d\sec(e+fx))^{5/3}}{a+ia\tan(e+fx)}\,dx = \frac{(d\sec(e+fx))^{5/3}\int \frac{(a-ia\tan(e+fx))^{5/6}}{\sqrt[6]{a+ia\tan(e+fx)}}\,dx}{(a-ia\tan(e+fx))^{5/6}(a+ia\tan(e+fx))^{5/6}}$$
$$= \frac{\left(a^2(d\sec(e+fx))^{5/3}\right)\text{Subst}\left(\int \frac{1}{\sqrt[6]{a-iax}\,(a+iax)^{7/6}}\,dx,x,\tan(e+fx)\right)}{f(a-ia\tan(e+fx))^{5/6}(a+ia\tan(e+fx))^{5/6}}$$
$$= \frac{\left(a(d\sec(e+fx))^{5/3}\sqrt[6]{\frac{a+ia\tan(e+fx)}{a}}\right)\text{Subst}\left(\int \frac{1}{\left(\frac{1}{2}+\frac{ix}{2}\right)^{7/6}\sqrt[6]{a-iax}}\,dx,x,\tan(e+fx)\right)}{2\sqrt[6]{2}\,f(a-ia\tan(e+fx))^{5/6}(a+ia\tan(e+fx))}$$
$$= \frac{3i\,{}_2F_1\left(\frac{5}{6},\frac{7}{6};\frac{11}{6};\frac{1}{2}(1-i\tan(e+fx))\right)(d\sec(e+fx))^{5/3}\sqrt[6]{1+i\tan(e+fx)}}{5\sqrt[6]{2}\,f(a+ia\tan(e+fx))}$$

Mathematica [A] time = 0.51, size = 84, normalized size = 1.01

$$\frac{6de^{i(e+fx)}\,{}_2F_1\left(-\frac{1}{6},\frac{2}{3};\frac{5}{6};-e^{2i(e+fx)}\right)(d\sec(e+fx))^{2/3}}{af\sqrt[3]{1+e^{2i(e+fx)}}\,(\tan(e+fx)-i)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(5/3)/(a + I*a*Tan[e + f*x]),x]
```

```
[Out] (6*d*E^(I*(e + f*x))*Hypergeometric2F1[-1/6, 2/3, 5/6, -E^((2*I)*(e + f*x))
]*(d*Sec[e + f*x])^(2/3))/(a*(1 + E^((2*I)*(e + f*x)))^(1/3)*f*(-I + Tan[e
+ f*x]))
```

fricas [F] time = 0.79, size = 0, normalized size = 0.00

$$\frac{\left(afe^{(ifx+ie)}\text{integral}\left(-\frac{i\cdot 2^{\frac{2}{3}}d\left(\frac{d}{e^{(2ifx+2ie)}+1}\right)^{\frac{2}{3}}e^{\left(\frac{2}{3}ifx+\frac{2}{3}ie\right)}}{af},x\right)+2^{\frac{2}{3}}\left(3ide^{(2ifx+2ie)}+3id\right)\left(\frac{d}{e^{(2ifx+2ie)}+1}\right)^{\frac{2}{3}}e^{\left(\frac{2}{3}ifx+\frac{2}{3}ie\right)}\right)e^{(-ifx}}{af}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)/(a+I*a*tan(f*x+e)),x, algorithm="fricas")
```

```
[Out] (a*f*e^(I*f*x + I*e)*integral(-I*2^(2/3)*d*(d/(e^(2*I*f*x + 2*I*e) + 1))^(2
/3)*e^(2/3*I*f*x + 2/3*I*e)/(a*f), x) + 2^(2/3)*(3*I*d*e^(2*I*f*x + 2*I*e)
+ 3*I*d)*(d/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*e^(2/3*I*f*x + 2/3*I*e))*e^(-I
*f*x - I*e)/(a*f)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}}{i\,a\tan\left(fx+e\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)/(a+I*a*tan(f*x+e)),x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(5/3)/(I*a*tan(f*x + e) + a), x)
```

maple [F] time = 0.94, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}}{a+ia\tan\left(fx+e\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(5/3)/(a+I*a*tan(f*x+e)),x)
```

```
[Out] int((d*sec(f*x+e))^(5/3)/(a+I*a*tan(f*x+e)),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)/(a+I*a*tan(f*x+e)),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{5/3}}{a+a\,\tan\left(e+f\,x\right)\,1{}\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(5/3)/(a + a*tan(e + f*x)*1i),x)
```

```
[Out] int((d/cos(e + f*x))^(5/3)/(a + a*tan(e + f*x)*1i), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\int \frac{\left(d\sec\left(e+fx\right)\right)^{\frac{5}{3}}}{\tan\left(e+fx\right)-i}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(5/3)/(a+I*a*tan(f*x+e)),x)
```

```
[Out] -I*Integral((d*sec(e + f*x))**(5/3)/(tan(e + f*x) - I), x)/a
```

3.272 $\int \frac{\sqrt[3]{d\sec(e+fx)}}{a+ia\tan(e+fx)}\,dx$

Optimal. Leaf size=81

$$\frac{3i(1+i\tan(e+fx))^{5/6}\sqrt[3]{d\sec(e+fx)}\ {}_2F_1\left(\frac{1}{6},\frac{11}{6};\frac{7}{6};\frac{1}{2}(1-i\tan(e+fx))\right)}{2^{5/6}f(a+ia\tan(e+fx))}$$

```
[Out] 3/2*I*hypergeom([1/6, 11/6],[7/6],1/2-1/2*I*tan(f*x+e))*(d*sec(f*x+e))^(1/3
)*(1+I*tan(f*x+e))^(5/6)*2^(1/6)/f/(a+I*a*tan(f*x+e))
```

Rubi [A] time = 0.17, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3505, 3523, 70, 69}

$$\frac{3i(1+i\tan(e+fx))^{5/6}\sqrt[3]{d\sec(e+fx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{11}{6},\frac{7}{6},\frac{1}{2}(1-i\tan(e+fx))\right)}{2^{5/6}f(a+ia\tan(e+fx))}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(1/3)/(a + I*a*Tan[e + f*x]),x]
```

```
[Out] ((3*I)*Hypergeometric2F1[1/6, 11/6, 7/6, (1 - I*Tan[e + f*x])/2]*(d*Sec[e +
 f*x])^(1/3)*(1 + I*Tan[e + f*x])^(5/6))/(2^(5/6)*f*(a + I*a*Tan[e + f*x]))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{\sqrt[3]{d\sec(e+fx)}}{a+ia\tan(e+fx)}\,dx = \frac{\sqrt[3]{d\sec(e+fx)}\int \frac{\sqrt[6]{a-ia\tan(e+fx)}}{(a+ia\tan(e+fx))^{5/6}}\,dx}{\sqrt[6]{a-ia\tan(e+fx)}\,\sqrt[6]{a+ia\tan(e+fx)}}$$
$$= \frac{\left(a^2\sqrt[3]{d\sec(e+fx)}\right)\text{Subst}\left(\int \frac{1}{(a-iax)^{5/6}(a+iax)^{11/6}}\,dx, x, \tan(e+fx)\right)}{f\sqrt[6]{a-ia\tan(e+fx)}\,\sqrt[6]{a+ia\tan(e+fx)}}$$
$$= \frac{\left(a\sqrt[3]{d\sec(e+fx)}\left(\frac{a+ia\tan(e+fx)}{a}\right)^{5/6}\right)\text{Subst}\left(\int \frac{1}{\left(\frac{1}{2}+\frac{ix}{2}\right)^{11/6}(a-iax)^{5/6}}\,dx, x, \tan(e+fx)\right)}{2\,2^{5/6}f\sqrt[6]{a-ia\tan(e+fx)}\,(a+ia\tan(e+fx))}$$
$$= \frac{3i\,{}_2F_1\left(\frac{1}{6},\frac{11}{6};\frac{7}{6};\frac{1}{2}(1-i\tan(e+fx))\right)\sqrt[3]{d\sec(e+fx)}\,(1+i\tan(e+fx))^{5/6}}{2^{5/6}f(a+ia\tan(e+fx))}$$

Mathematica [A] time = 0.49, size = 103, normalized size = 1.27

$$-\frac{3ie^{-2i(e+fx)}\left(4e^{2i(e+fx)}\sqrt[3]{1+e^{2i(e+fx)}}\,{}_2F_1\left(\frac{1}{6},\frac{1}{3};\frac{7}{6};-e^{2i(e+fx)}\right)-e^{2i(e+fx)}-1\right)\sqrt[3]{d\sec(e+fx)}}{10af}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(1/3)/(a + I*a*Tan[e + f*x]),x]
```

```
[Out] (((-3*I)/10)*(-1 - E^((2*I)*(e + f*x)) + 4*E^((2*I)*(e + f*x))*(1 + E^((2*I
)*(e + f*x)))^(1/3)*Hypergeometric2F1[1/6, 1/3, 7/6, -E^((2*I)*(e + f*x))])
*(d*Sec[e + f*x])^(1/3))/(a*E^((2*I)*(e + f*x))*f)
```

fricas [F] time = 0.69, size = 0, normalized size = 0.00

$$\frac{\left(10\,afe^{\left(2i\,fx+2i\,e\right)}\text{integral}\left(-\frac{2i\cdot 2^{\frac{1}{3}}\left(\frac{d}{e^{\left(2i\,fx+2i\,e\right)}+1}\right)^{\frac{1}{3}}e^{\left(-\frac{2}{3}i\,fx-\frac{2}{3}i\,e\right)}}{5\,af},x\right)+2^{\frac{1}{3}}\left(\frac{d}{e^{\left(2i\,fx+2i\,e\right)}+1}\right)^{\frac{1}{3}}\left(3i\,e^{\left(2i\,fx+2i\,e\right)}+3i\right)e^{\left(\frac{1}{3}i\,fx+\frac{1}{3}i\,e\right)}\right)}{10\,af}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)/(a+I*a*tan(f*x+e)),x, algorithm="fricas")
```

```
[Out] 1/10*(10*a*f*e^(2*I*f*x + 2*I*e)*integral(-2/5*I*2^(1/3)*(d/(e^(2*I*f*x + 2
*I*e) + 1))^(1/3)*e^(-2/3*I*f*x - 2/3*I*e)/(a*f), x) + 2^(1/3)*(d/(e^(2*I*f
*x + 2*I*e) + 1))^(1/3)*(3*I*e^(2*I*f*x + 2*I*e) + 3*I)*e^(1/3*I*f*x + 1/3*
I*e))*e^(-2*I*f*x - 2*I*e)/(a*f)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}}{i\,a\tan\left(fx+e\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)/(a+I*a*tan(f*x+e)),x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(1/3)/(I*a*tan(f*x + e) + a), x)
```

maple [F] time = 1.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec \left(f x+e\right)\right)^{\frac{1}{3}}}{a+ia \tan \left(f x+e\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(1/3)/(a+I*a*tan(f*x+e)),x)
```

```
[Out] int((d*sec(f*x+e))^(1/3)/(a+I*a*tan(f*x+e)),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)/(a+I*a*tan(f*x+e)),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{1/3}}{a+a\,\mathrm{tan}\left(e+f\,x\right)\,1{}\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(1/3)/(a + a*tan(e + f*x)*1i),x)
```

```
[Out] int((d/cos(e + f*x))^(1/3)/(a + a*tan(e + f*x)*1i), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i \int \frac{\sqrt[3]{d \sec \left(e+f x\right)}}{\tan \left(e+f x\right)-i}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(1/3)/(a+I*a*tan(f*x+e)),x)
```

```
[Out] -I*Integral((d*sec(e + f*x))**(1/3)/(tan(e + f*x) - I), x)/a
```

3.273 $\int \frac{1}{\sqrt[3]{d\sec(e+fx)}\,(a+ia\tan(e+fx))}\,dx$

Optimal. Leaf size=71

$$-\frac{3i\sqrt[6]{1+i\tan(e+fx)}\,{}_2F_1\left(-\frac{1}{6},\frac{13}{6};\frac{5}{6};\frac{1}{2}(1-i\tan(e+fx))\right)}{2\sqrt[6]{2}\,af\sqrt[3]{d\sec(e+fx)}}$$

```
[Out] -3/4*I*hypergeom([-1/6, 13/6],[5/6],1/2-1/2*I*tan(f*x+e))*(1+I*tan(f*x+e))^
(1/6)*2^(5/6)/a/f/(d*sec(f*x+e))^(1/3)
```

Rubi [A] time = 0.18, antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3505, 3523, 70, 69}

$$-\frac{3i\sqrt[6]{1+i\tan(e+fx)}\,\text{Hypergeometric2F1}\left(-\frac{1}{6},\frac{13}{6},\frac{5}{6},\frac{1}{2}(1-i\tan(e+fx))\right)}{2\sqrt[6]{2}\,af\sqrt[3]{d\sec(e+fx)}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((d*Sec[e + f*x])^(1/3)*(a + I*a*Tan[e + f*x])),x]
```

```
[Out] (((-3*I)/2)*Hypergeometric2F1[-1/6, 13/6, 5/6, (1 - I*Tan[e + f*x])/2]*(1 +
 I*Tan[e + f*x])^(1/6))/(2^(1/6)*a*f*(d*Sec[e + f*x])^(1/3))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] && !IntegerQ[m] && !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] || !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !In
tegerQ[m] && !IntegerQ[n] && (RationalQ[m] || !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{1}{\sqrt[3]{d\sec(e+fx)}\,(a+ia\tan(e+fx))}\,dx = \frac{\left(\sqrt[6]{a-ia\tan(e+fx)}\,\sqrt[6]{a+ia\tan(e+fx)}\right)\int \frac{1}{\sqrt[6]{a-ia\tan(e+fx)}\,(a+ia\tan(e+}}{\sqrt[3]{d\sec(e+fx)}}$$

$$= \frac{\left(a^2\sqrt[6]{a-ia\tan(e+fx)}\,\sqrt[6]{a+ia\tan(e+fx)}\right)\text{Subst}\left(\int \frac{1}{(a-iax)^{7/6}(a+iax)}\right.}{f\sqrt[3]{d\sec(e+fx)}}$$

$$= \frac{\left(\sqrt[6]{a-ia\tan(e+fx)}\,\sqrt[6]{\frac{a+ia\tan(e+fx)}{a}}\right)\text{Subst}\left(\int \frac{1}{\left(\frac{1}{2}+\frac{ix}{2}\right)^{13/6}(a-iax)^{7/6}}\,dx, x\right.}{4\sqrt[6]{2}\,f\sqrt[3]{d\sec(e+fx)}}$$

$$= -\frac{3i\,{}_2F_1\left(-\frac{1}{6},\frac{13}{6};\frac{5}{6};\frac{1}{2}(1-i\tan(e+fx))\right)\sqrt[6]{1+i\tan(e+fx)}}{2\sqrt[6]{2}\,af\sqrt[3]{d\sec(e+fx)}}$$

Mathematica [A] time = 0.99, size = 112, normalized size = 1.58

$$\frac{3(\tan(e+fx)+i)\left(5(4i\sin(2(e+fx))+5\cos(2(e+fx))+5)-8e^{2i(e+fx)}\left(1+e^{2i(e+fx)}\right)^{2/3}{}_2F_1\left(\frac{2}{3},\frac{5}{6};\frac{11}{6};-e^{2i(e+fx)}\right.\right.}{70af\sqrt[3]{d\sec(e+fx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((d*Sec[e + f*x])^(1/3)*(a + I*a*Tan[e + f*x])),x]
```

```
[Out] (3*(-8*E^((2*I)*(e + f*x))*(1 + E^((2*I)*(e + f*x)))^(2/3)*Hypergeometric2F
1[2/3, 5/6, 11/6, -E^((2*I)*(e + f*x))] + 5*(5 + 5*Cos[2*(e + f*x)] + (4*I)
*Sin[2*(e + f*x)]))*(I + Tan[e + f*x]))/(70*a*f*(d*Sec[e + f*x])^(1/3))
```

fricas [F] time = 0.92, size = 0, normalized size = 0.00

$$\frac{2^{\frac{2}{3}}\left(\frac{d}{e^{(2ifx+2ie)}+1}\right)^{\frac{2}{3}}\left(-21ie^{(5ifx+5ie)}-27ie^{(4ifx+4ie)}-18ie^{(3ifx+3ie)}-30ie^{(2ifx+2ie)}+3ie^{(ifx+ie)}-3i\right)e^{\left(\frac{2}{3}ifx+\frac{2}{3}ie\right)}+}{28\left(adfe^{(4ifx+4ie)}-adf\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(1/3)/(a+I*a*tan(f*x+e)),x, algorithm="fricas")
```

```
[Out] 1/28*(2^(2/3)*(d/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*(-21*I*e^(5*I*f*x + 5*I*e
) - 27*I*e^(4*I*f*x + 4*I*e) - 18*I*e^(3*I*f*x + 3*I*e) - 30*I*e^(2*I*f*x +
 2*I*e) + 3*I*e^(I*f*x + I*e) - 3*I)*e^(2/3*I*f*x + 2/3*I*e) + 28*(a*d*f*e^
(4*I*f*x + 4*I*e) - a*d*f*e^(3*I*f*x + 3*I*e))*integral(1/7*2^(2/3)*(d/(e^(
2*I*f*x + 2*I*e) + 1))^(2/3)*(-8*I*e^(2*I*f*x + 2*I*e) - 8*I*e^(I*f*x + I*e
) - 8*I)*e^(2/3*I*f*x + 2/3*I*e)/(a*d*f*e^(3*I*f*x + 3*I*e) - 2*a*d*f*e^(2*
I*f*x + 2*I*e) + a*d*f*e^(I*f*x + I*e)), x))/(a*d*f*e^(4*I*f*x + 4*I*e) - a
*d*f*e^(3*I*f*x + 3*I*e))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}\left(ia\tan\left(fx+e\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(1/3)/(a+I*a*tan(f*x+e)),x, algorithm="giac")
[Out] integrate(1/((d*sec(f*x + e))^(1/3)*(I*a*tan(f*x + e) + a)), x)
```

maple [F] time = 0.88, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d \sec \left(f x+e\right)\right)^{\frac{1}{3}} \left(a+i a \tan \left(f x+e\right)\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*sec(f*x+e))^(1/3)/(a+I*a*tan(f*x+e)),x)
[Out] int(1/(d*sec(f*x+e))^(1/3)/(a+I*a*tan(f*x+e)),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(1/3)/(a+I*a*tan(f*x+e)),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{1/3}\,\left(a+a\,\mathrm{tan}\left(e+f\,x\right)\,1{}\mathrm{i}\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d/cos(e + f*x))^(1/3)*(a + a*tan(e + f*x)*1i)),x)
[Out] int(1/((d/cos(e + f*x))^(1/3)*(a + a*tan(e + f*x)*1i)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$- \frac{i \int \frac{1}{\sqrt[3]{d \sec{\left(e + f x \right)}} \tan{\left(e + f x \right)} - i \sqrt[3]{d \sec{\left(e + f x \right)}}}\, dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))**(1/3)/(a+I*a*tan(f*x+e)),x)
[Out] -I*Integral(1/((d*sec(e + f*x))**(1/3)*tan(e + f*x) - I*(d*sec(e + f*x))**(
1/3)), x)/a
```

3.274 $\int \frac{1}{(d\sec(e+fx))^{5/3}(a+ia\tan(e+fx))}\,dx$

Optimal. Leaf size=71

$$-\frac{3i(1+i\tan(e+fx))^{5/6}\,{}_2F_1\left(-\frac{5}{6},\frac{17}{6};\frac{1}{6};\frac{1}{2}(1-i\tan(e+fx))\right)}{10\,2^{5/6}af(d\sec(e+fx))^{5/3}}$$

```
[Out] -3/20*I*hypergeom([-5/6, 17/6],[1/6],1/2-1/2*I*tan(f*x+e))*(1+I*tan(f*x+e))
^(5/6)*2^(1/6)/a/f/(d*sec(f*x+e))^(5/3)
```

Rubi [A] time = 0.21, antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {3505, 3523, 70, 69}

$$-\frac{3i(1+i\tan(e+fx))^{5/6}\text{Hypergeometric2F1}\left(-\frac{5}{6},\frac{17}{6},\frac{1}{6},\frac{1}{2}(1-i\tan(e+fx))\right)}{10\,2^{5/6}af(d\sec(e+fx))^{5/3}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((d*Sec[e + f*x])^(5/3)*(a + I*a*Tan[e + f*x])),x]
```

```
[Out] (((-3*I)/10)*Hypergeometric2F1[-5/6, 17/6, 1/6, (1 - I*Tan[e + f*x])/2]*(1
+ I*Tan[e + f*x])^(5/6))/(2^(5/6)*a*f*(d*Sec[e + f*x])^(5/3))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{1}{(d\sec(e+fx))^{5/3}(a+ia\tan(e+fx))}dx = \frac{\left((a-ia\tan(e+fx))^{5/6}(a+ia\tan(e+fx))^{5/6}\right)\int \frac{}{(a-ia\tan(e+fx))^{5/6}(}}{(d\sec(e+fx))^{5/3}}$$
$$= \frac{\left(a^2(a-ia\tan(e+fx))^{5/6}(a+ia\tan(e+fx))^{5/6}\right)\text{Subst}\left(\int \frac{}{(a-iax)}\right.}{f(d\sec(e+fx))^{5/3}}$$
$$= \frac{\left((a-ia\tan(e+fx))^{5/6}\left(\frac{a+ia\tan(e+fx)}{a}\right)^{5/6}\right)\text{Subst}\left(\int \frac{1}{\left(\frac{1}{2}+\frac{ix}{2}\right)^{17/6}(a-ia}\right.}{4\,2^{5/6}f(d\sec(e+fx))^{5/3}}$$
$$= -\frac{3i\,{}_2F_1\left(-\frac{5}{6},\frac{17}{6};\frac{1}{6};\frac{1}{2}(1-i\tan(e+fx))\right)(1+i\tan(e+fx))^{5/6}}{10\,2^{5/6}af(d\sec(e+fx))^{5/3}}$$

Mathematica [A] time = 0.95, size = 119, normalized size = 1.68

$$-\frac{3\sec^2(e+fx)\left(\frac{128e^{2i(e+fx)}\,{}_2F_1\left(\frac{1}{6},\frac{1}{3};\frac{7}{6};-e^{2i(e+fx)}\right)}{\left(1+e^{2i(e+fx)}\right)^{2/3}}+16i\sin(2(e+fx))+6\cos(2(e+fx))-26\right)}{220af(\tan(e+fx)-i)(d\sec(e+fx))^{5/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((d*Sec[e + f*x])^(5/3)*(a + I*a*Tan[e + f*x])),x]
```

```
[Out] (-3*Sec[e + f*x]^2*(-26 + 6*Cos[2*(e + f*x)] + (128*E^((2*I)*(e + f*x))*Hyp
ergeometric2F1[1/6, 1/3, 7/6, -E^((2*I)*(e + f*x))])/(1 + E^((2*I)*(e + f*x
)))^(2/3) + (16*I)*Sin[2*(e + f*x)]))/(220*a*f*(d*Sec[e + f*x])^(5/3)*(-I +
 Tan[e + f*x]))
```

fricas [F] time = 0.52, size = 0, normalized size = 0.00

$$\frac{\left(440\,ad^2fe^{(4i\,fx+4i\,e)}\text{integral}\left(-\frac{16i\cdot 2^{\frac{1}{3}}\left(\frac{d}{e^{(2i\,fx+2i\,e)}+1}\right)^{\frac{1}{3}}e^{\left(-\frac{2}{3}i\,fx-\frac{2}{3}i\,e\right)}}{55\,ad^2f},x\right)+2^{\frac{1}{3}}\left(\frac{d}{e^{(2i\,fx+2i\,e)}+1}\right)^{\frac{1}{3}}\left(-33i\,e^{(6i\,fx+6i\,e)}+45i\,e^{(4i}\right.\right.}{440\,ad^2f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(5/3)/(a+I*a*tan(f*x+e)),x, algorithm="fricas")
```

```
[Out] 1/440*(440*a*d^2*f*e^(4*I*f*x + 4*I*e)*integral(-16/55*I*2^(1/3)*(d/(e^(2*I
*f*x + 2*I*e) + 1))^(1/3)*e^(-2/3*I*f*x - 2/3*I*e)/(a*d^2*f), x) + 2^(1/3)*
(d/(e^(2*I*f*x + 2*I*e) + 1))^(1/3)*(-33*I*e^(6*I*f*x + 6*I*e) + 45*I*e^(4*
I*f*x + 4*I*e) + 93*I*e^(2*I*f*x + 2*I*e) + 15*I)*e^(1/3*I*f*x + 1/3*I*e))*
e^(-4*I*f*x - 4*I*e)/(a*d^2*f)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}\left(i\,a\tan\left(fx+e\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(5/3)/(a+I*a*tan(f*x+e)),x, algorithm="giac")
```

```
[Out] integrate(1/((d*sec(f*x + e))^(5/3)*(I*a*tan(f*x + e) + a)), x)
```

maple [F] time = 0.89, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}\left(a+ia\tan\left(fx+e\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*sec(f*x+e))^(5/3)/(a+I*a*tan(f*x+e)),x)
```

```
[Out] int(1/(d*sec(f*x+e))^(5/3)/(a+I*a*tan(f*x+e)),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(5/3)/(a+I*a*tan(f*x+e)),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{5/3}\,\left(a+a\,\tan\left(e+f\,x\right)\,1{}\mathrm{i}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d/cos(e + f*x))^(5/3)*(a + a*tan(e + f*x)*1i)),x)
```

```
[Out] int(1/((d/cos(e + f*x))^(5/3)*(a + a*tan(e + f*x)*1i)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\int\frac{1}{\left(d\sec\left(e+fx\right)\right)^{\frac{5}{3}}\tan\left(e+fx\right)-i\left(d\sec\left(e+fx\right)\right)^{\frac{5}{3}}}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))**(5/3)/(a+I*a*tan(f*x+e)),x)
```

```
[Out] -I*Integral(1/((d*sec(e + f*x))**(5/3)*tan(e + f*x) - I*(d*sec(e + f*x))**(
5/3)), x)/a
```

3.275 $\int \frac{(d\sec(e+fx))^{5/3}}{(a+ia\tan(e+fx))^2}\,dx$

Optimal. Leaf size=87

$$\frac{3i\sqrt[6]{1+i\tan(e+fx)}\,(d\sec(e+fx))^{5/3}\,{}_2F_1\left(\frac{5}{6},\frac{13}{6};\frac{11}{6};\frac{1}{2}(1-i\tan(e+fx))\right)}{10\sqrt[6]{2}\,f\left(a^2+ia^2\tan(e+fx)\right)}$$

```
[Out] 3/20*I*hypergeom([5/6, 13/6],[11/6],1/2-1/2*I*tan(f*x+e))*(d*sec(f*x+e))^(5
/3)*(1+I*tan(f*x+e))^(1/6)*2^(5/6)/f/(a^2+I*a^2*tan(f*x+e))
```

Rubi [A] time = 0.19, antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {3505, 3523, 70, 69}

$$\frac{3i\sqrt[6]{1+i\tan(e+fx)}\,(d\sec(e+fx))^{5/3}\text{Hypergeometric2F1}\left(\frac{5}{6},\frac{13}{6},\frac{11}{6},\frac{1}{2}(1-i\tan(e+fx))\right)}{10\sqrt[6]{2}\,f\left(a^2+ia^2\tan(e+fx)\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(5/3)/(a + I*a*Tan[e + f*x])^2,x]
```

```
[Out] (((3*I)/10)*Hypergeometric2F1[5/6, 13/6, 11/6, (1 - I*Tan[e + f*x])/2]*(d*S
ec[e + f*x])^(5/3)*(1 + I*Tan[e + f*x])^(1/6))/(2^(1/6)*f*(a^2 + I*a^2*Tan[
e + f*x]))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(d\sec(e+fx))^{5/3}}{(a+ia\tan(e+fx))^2}\,dx = \frac{(d\sec(e+fx))^{5/3}\int \frac{(a-ia\tan(e+fx))^{5/6}}{(a+ia\tan(e+fx))^{7/6}}\,dx}{(a-ia\tan(e+fx))^{5/6}(a+ia\tan(e+fx))^{5/6}}$$
$$= \frac{\left(a^2(d\sec(e+fx))^{5/3}\right)\text{Subst}\left(\int \frac{1}{\sqrt[6]{a-iax}\,(a+iax)^{13/6}}\,dx,x,\tan(e+fx)\right)}{f(a-ia\tan(e+fx))^{5/6}(a+ia\tan(e+fx))^{5/6}}$$
$$= \frac{\left((d\sec(e+fx))^{5/3}\sqrt[6]{\frac{a+ia\tan(e+fx)}{a}}\right)\text{Subst}\left(\int \frac{1}{\left(\frac{1}{2}+\frac{ix}{2}\right)^{13/6}\sqrt[6]{a-iax}}\,dx,x,\tan(e+fx)\right)}{4\sqrt[6]{2}\,f(a-ia\tan(e+fx))^{5/6}(a+ia\tan(e+fx))}$$
$$= \frac{3i\,{}_2F_1\left(\frac{5}{6},\frac{13}{6};\frac{11}{6};\frac{1}{2}(1-i\tan(e+fx))\right)(d\sec(e+fx))^{5/3}\sqrt[6]{1+i\tan(e+fx)}}{10\sqrt[6]{2}\,f\left(a^2+ia^2\tan(e+fx)\right)}$$

Mathematica [A] time = 0.76, size = 128, normalized size = 1.47

$$-\frac{3e^{-i(4e+5fx)}\left(1+e^{2i(e+fx)}\right)\left(2e^{2i(e+fx)}\left(1+e^{2i(e+fx)}\right)^{2/3}{}_2F_1\left(-\frac{1}{6},\frac{2}{3};\frac{5}{6};-e^{2i(e+fx)}\right)+e^{2i(e+fx)}+1\right)(\sin(fx)-i\cos(fx}{28a^2f}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(5/3)/(a + I*a*Tan[e + f*x])^2,x]
```

```
[Out] (-3*(1 + E^((2*I)*(e + f*x)))*(1 + E^((2*I)*(e + f*x)) + 2*E^((2*I)*(e + f*
x))*(1 + E^((2*I)*(e + f*x)))^(2/3)*Hypergeometric2F1[-1/6, 2/3, 5/6, -E^((
2*I)*(e + f*x))])*(d*Sec[e + f*x])^(5/3)*((-I)*Cos[f*x] + Sin[f*x]))/(28*a^
2*E^(I*(4*e + 5*f*x))*f)
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\frac{\left(14\,a^2fe^{(3i\,fx+3i\,e)}\text{integral}\left(-\frac{i\cdot 2^{\frac{2}{3}}d\left(\frac{d}{e^{(2i\,fx+2i\,e)}+1}\right)^{\frac{2}{3}}e^{\left(\frac{2}{3}i\,fx+\frac{2}{3}i\,e\right)}}{7\,a^2f},x\right)+2^{\frac{2}{3}}\left(6i\,de^{(4i\,fx+4i\,e)}+9i\,de^{(2i\,fx+2i\,e)}+3i\,d\right)\left(\frac{d}{e^{(2i\,fx+2i\,e)}}\right.\right.}{14\,a^2f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)/(a+I*a*tan(f*x+e))^2,x, algorithm="fricas")
```

```
[Out] 1/14*(14*a^2*f*e^(3*I*f*x + 3*I*e)*integral(-1/7*I*2^(2/3)*d*(d/(e^(2*I*f*x
 + 2*I*e) + 1))^(2/3)*e^(2/3*I*f*x + 2/3*I*e)/(a^2*f), x) + 2^(2/3)*(6*I*d*
e^(4*I*f*x + 4*I*e) + 9*I*d*e^(2*I*f*x + 2*I*e) + 3*I*d)*(d/(e^(2*I*f*x + 2
*I*e) + 1))^(2/3)*e^(2/3*I*f*x + 2/3*I*e))*e^(-3*I*f*x - 3*I*e)/(a^2*f)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}}{\left(ia\tan\left(fx+e\right)+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)/(a+I*a*tan(f*x+e))^2,x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(5/3)/(I*a*tan(f*x + e) + a)^2, x)
```

maple [F] time = 1.08, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(fx+e\right)\right)^{\frac{5}{3}}}{\left(a+ia\tan\left(fx+e\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(5/3)/(a+I*a*tan(f*x+e))^2,x)
```

```
[Out] int((d*sec(f*x+e))^(5/3)/(a+I*a*tan(f*x+e))^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)/(a+I*a*tan(f*x+e))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{5/3}}{{\left(a+a\,\tan\left(e+f\,x\right)\,1{}\mathrm{i}\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(5/3)/(a + a*tan(e + f*x)*1i)^2,x)
```

```
[Out] int((d/cos(e + f*x))^(5/3)/(a + a*tan(e + f*x)*1i)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{\left(d \sec\left(e+fx\right)\right)^{\frac{5}{3}}}{\tan^{2}\left(e+fx\right)-2i\tan\left(e+fx\right)-1}\,dx}{a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(5/3)/(a+I*a*tan(f*x+e))**2,x)
```

```
[Out] -Integral((d*sec(e + f*x))**(5/3)/(tan(e + f*x)**2 - 2*I*tan(e + f*x) - 1),
 x)/a**2
```

3.276 $\int \frac{\sqrt[3]{d\sec(e+fx)}}{(a+ia\tan(e+fx))^2}\,dx$

Optimal. Leaf size=87

$$\frac{3i(1+i\tan(e+fx))^{5/6}\sqrt[3]{d\sec(e+fx)}\,{}_2F_1\left(\frac{1}{6},\frac{17}{6};\frac{7}{6};\frac{1}{2}(1-i\tan(e+fx))\right)}{2\,2^{5/6}f\left(a^2+ia^2\tan(e+fx)\right)}$$

```
[Out] 3/4*I*hypergeom([1/6, 17/6],[7/6],1/2-1/2*I*tan(f*x+e))*(d*sec(f*x+e))^(1/3
)*(1+I*tan(f*x+e))^(5/6)*2^(1/6)/f/(a^2+I*a^2*tan(f*x+e))
```

Rubi [A] time = 0.17, antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3505, 3523, 70, 69}

$$\frac{3i(1+i\tan(e+fx))^{5/6}\sqrt[3]{d\sec(e+fx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{17}{6},\frac{7}{6},\frac{1}{2}(1-i\tan(e+fx))\right)}{2\,2^{5/6}f\left(a^2+ia^2\tan(e+fx)\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(1/3)/(a + I*a*Tan[e + f*x])^2,x]
```

```
[Out] (((3*I)/2)*Hypergeometric2F1[1/6, 17/6, 7/6, (1 - I*Tan[e + f*x])/2]*(d*Sec
[e + f*x])^(1/3)*(1 + I*Tan[e + f*x])^(5/6))/(2^(5/6)*f*(a^2 + I*a^2*Tan[e
+ f*x]))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{\sqrt[3]{d\sec(e+fx)}}{(a+ia\tan(e+fx))^2}\,dx = \frac{\sqrt[3]{d\sec(e+fx)}\int \frac{\sqrt[6]{a-ia\tan(e+fx)}}{(a+ia\tan(e+fx))^{11/6}}\,dx}{\sqrt[6]{a-ia\tan(e+fx)}\,\sqrt[6]{a+ia\tan(e+fx)}}$$
$$= \frac{\left(a^2\sqrt[3]{d\sec(e+fx)}\right)\text{Subst}\left(\int \frac{1}{(a-iax)^{5/6}(a+iax)^{17/6}}\,dx,x,\tan(e+fx)\right)}{f\sqrt[6]{a-ia\tan(e+fx)}\,\sqrt[6]{a+ia\tan(e+fx)}}$$
$$= \frac{\left(\sqrt[3]{d\sec(e+fx)}\left(\frac{a+ia\tan(e+fx)}{a}\right)^{5/6}\right)\text{Subst}\left(\int \frac{1}{\left(\frac{1}{2}+\frac{ix}{2}\right)^{17/6}(a-iax)^{5/6}}\,dx,x,\tan(e+fx)\right.}{4\,2^{5/6}f\sqrt[6]{a-ia\tan(e+fx)}\,(a+ia\tan(e+fx))}$$
$$= \frac{3i\,{}_2F_1\left(\frac{1}{6},\frac{17}{6};\frac{7}{6};\frac{1}{2}(1-i\tan(e+fx))\right)\sqrt[3]{d\sec(e+fx)}\,(1+i\tan(e+fx))^{5/6}}{2\,2^{5/6}f\left(a^2+ia^2\tan(e+fx)\right)}$$

Mathematica [A] time = 0.61, size = 121, normalized size = 1.39

$$\frac{3\sec^2(e+fx)\sqrt[3]{d\sec(e+fx)}\left(4ie^{2i(e+fx)}\sqrt[3]{1+e^{2i(e+fx)}}\,{}_2F_1\left(\frac{1}{6},\frac{1}{3};\frac{7}{6};-e^{2i(e+fx)}\right)+\sin(2(e+fx))-2i\cos(2(e+\right.}{22a^2f(\tan(e+fx)-i)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(1/3)/(a + I*a*Tan[e + f*x])^2,x]
```

```
[Out] (3*Sec[e + f*x]^2*(d*Sec[e + f*x])^(1/3)*(-2*I - (2*I)*Cos[2*(e + f*x)] + (
4*I)*E^((2*I)*(e + f*x))*(1 + E^((2*I)*(e + f*x)))^(1/3)*Hypergeometric2F1[
1/6, 1/3, 7/6, -E^((2*I)*(e + f*x))] + Sin[2*(e + f*x)]))/(22*a^2*f*(-I + T
an[e + f*x])^2)
```

fricas [F] time = 1.20, size = 0, normalized size = 0.00

$$\frac{\left(44\,a^2fe^{(4ifx+4ie)}\text{integral}\left(-\frac{2i\cdot 2^{\frac{1}{3}}\left(\frac{d}{e^{(2ifx+2ie)}+1}\right)^{\frac{1}{3}}e^{\left(-\frac{2}{3}ifx-\frac{2}{3}ie\right)}}{11\,a^2f},x\right)+2^{\frac{1}{3}}\left(\frac{d}{e^{(2ifx+2ie)}+1}\right)^{\frac{1}{3}}\left(9i\,e^{(4ifx+4ie)}+12i\,e^{(2ifx+2ie)}\right.\right.}{44\,a^2f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)/(a+I*a*tan(f*x+e))^2,x, algorithm="fricas")
```

```
[Out] 1/44*(44*a^2*f*e^(4*I*f*x + 4*I*e)*integral(-2/11*I*2^(1/3)*(d/(e^(2*I*f*x
+ 2*I*e) + 1))^(1/3)*e^(-2/3*I*f*x - 2/3*I*e)/(a^2*f), x) + 2^(1/3)*(d/(e^(
2*I*f*x + 2*I*e) + 1))^(1/3)*(9*I*e^(4*I*f*x + 4*I*e) + 12*I*e^(2*I*f*x + 2
*I*e) + 3*I)*e^(1/3*I*f*x + 1/3*I*e))*e^(-4*I*f*x - 4*I*e)/(a^2*f)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}}{\left(i\,a\tan\left(fx+e\right)+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)/(a+I*a*tan(f*x+e))^2,x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(1/3)/(I*a*tan(f*x + e) + a)^2, x)
```

maple [F] time = 1.08, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}}{\left(a+ia\tan\left(fx+e\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(1/3)/(a+I*a*tan(f*x+e))^2,x)
```

```
[Out] int((d*sec(f*x+e))^(1/3)/(a+I*a*tan(f*x+e))^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)/(a+I*a*tan(f*x+e))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{1/3}}{{\left(a+a\,\mathrm{tan}\left(e+f\,x\right)\,1{}\mathrm{i}\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(1/3)/(a + a*tan(e + f*x)*1i)^2,x)
```

```
[Out] int((d/cos(e + f*x))^(1/3)/(a + a*tan(e + f*x)*1i)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{\sqrt[3]{d\sec\left(e+fx\right)}}{\tan^{2}\left(e+fx\right)-2i\tan\left(e+fx\right)-1}\,dx}{a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(1/3)/(a+I*a*tan(f*x+e))**2,x)
```

```
[Out] -Integral((d*sec(e + f*x))**(1/3)/(tan(e + f*x)**2 - 2*I*tan(e + f*x) - 1),
 x)/a**2
```

3.277 $\int \frac{1}{\sqrt[3]{d \sec(e+fx)}\,(a+ia\tan(e+fx))^2}\,dx$

Optimal. Leaf size=71

$$-\frac{3i\sqrt[6]{1+i\tan(e+fx)}\,{}_2F_1\left(-\frac{1}{6},\frac{19}{6};\frac{5}{6};\frac{1}{2}(1-i\tan(e+fx))\right)}{4\sqrt[6]{2}\,a^2 f\sqrt[3]{d\sec(e+fx)}}$$

```
[Out] -3/8*I*hypergeom([-1/6, 19/6],[5/6],1/2-1/2*I*tan(f*x+e))*(1+I*tan(f*x+e))^
(1/6)*2^(5/6)/a^2/f/(d*sec(f*x+e))^(1/3)
```

Rubi [A] time = 0.18, antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {3505, 3523, 70, 69}

$$-\frac{3i\sqrt[6]{1+i\tan(e+fx)}\,\text{Hypergeometric2F1}\left(-\frac{1}{6},\frac{19}{6},\frac{5}{6},\frac{1}{2}(1-i\tan(e+fx))\right)}{4\sqrt[6]{2}\,a^2 f\sqrt[3]{d\sec(e+fx)}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((d*Sec[e + f*x])^(1/3)*(a + I*a*Tan[e + f*x])^2),x]
```

```
[Out] (((-3*I)/4)*Hypergeometric2F1[-1/6, 19/6, 5/6, (1 - I*Tan[e + f*x])/2]*(1 +
 I*Tan[e + f*x])^(1/6))/(2^(1/6)*a^2*f*(d*Sec[e + f*x])^(1/3))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{1}{\sqrt[3]{d\sec(e+fx)}\,(a+ia\tan(e+fx))^2}\,dx = \frac{\left(\sqrt[6]{a-ia\tan(e+fx)}\,\sqrt[6]{a+ia\tan(e+fx)}\right)\int \frac{1}{\sqrt[6]{a-ia\tan(e+fx)}\,(a+ia\tan(e\cdots}}{\sqrt[3]{d\sec(e+fx)}}$$

$$= \frac{\left(a^2\sqrt[6]{a-ia\tan(e+fx)}\,\sqrt[6]{a+ia\tan(e+fx)}\right)\text{Subst}\left(\int \frac{1}{(a-iax)^{7/6}(a+iax\cdots}\right.}{f\sqrt[3]{d\sec(e+fx)}}$$

$$= \frac{\left(\sqrt[6]{a-ia\tan(e+fx)}\,\sqrt[6]{\frac{a+ia\tan(e+fx)}{a}}\right)\text{Subst}\left(\int \frac{1}{\left(\frac{1}{2}+\frac{ix}{2}\right)^{19/6}(a-iax)^{7/6}}dx,\right.}{8\sqrt[6]{2}\,af\sqrt[3]{d\sec(e+fx)}}$$

$$= -\frac{3i\,{}_2F_1\left(-\frac{1}{6},\frac{19}{6};\frac{5}{6};\frac{1}{2}(1-i\tan(e+fx))\right)\sqrt[6]{1+i\tan(e+fx)}}{4\sqrt[6]{2}\,a^2f\sqrt[3]{d\sec(e+fx)}}$$

Mathematica [A] time = 1.45, size = 141, normalized size = 1.99

$$\frac{(d\sec(e+fx))^{2/3}(-3\sin(2(e+fx))-3i\cos(2(e+fx)))\left(16e^{3i(e+fx)}\left(1+e^{2i(e+fx)}\right)^{2/3}{}_2F_1\left(\frac{2}{3},\frac{5}{6};\frac{11}{6};-e^{2i(e+fx)}\right)-10\cdots\right.}{260a^2df}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((d*Sec[e + f*x])^(1/3)*(a + I*a*Tan[e + f*x])^2),x]
```

```
[Out] ((d*Sec[e + f*x])^(2/3)*(16*E^((3*I)*(e + f*x))*(1 + E^((2*I)*(e + f*x)))^(
2/3)*Hypergeometric2F1[2/3, 5/6, 11/6, -E^((2*I)*(e + f*x))] - 10*(7*Cos[e
+ f*x] + 5*Cos[3*(e + f*x)] + (18*I)*Cos[e + f*x]^2*Sin[e + f*x]))*((-3*I)*
Cos[2*(e + f*x)] - 3*Sin[2*(e + f*x)]))/(260*a^2*d*f)
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\frac{2^{\frac{2}{3}}\left(\frac{d}{e^{(2ifx+2ie)}+1}\right)^{\frac{2}{3}}\left(-39i\,e^{(7ifx+7ie)}-57i\,e^{(6ifx+6ie)}-27i\,e^{(5ifx+5ie)}-69i\,e^{(4ifx+4ie)}+15i\,e^{(3ifx+3ie)}-15i\,e^{(2ifx+2i\cdots}\right.}{104\left(a^2d\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(1/3)/(a+I*a*tan(f*x+e))^2,x, algorithm="fricas"
)
```

```
[Out] 1/104*(2^(2/3)*(d/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*(-39*I*e^(7*I*f*x + 7*I*
e) - 57*I*e^(6*I*f*x + 6*I*e) - 27*I*e^(5*I*f*x + 5*I*e) - 69*I*e^(4*I*f*x
+ 4*I*e) + 15*I*e^(3*I*f*x + 3*I*e) - 15*I*e^(2*I*f*x + 2*I*e) + 3*I*e^(I*f
*x + I*e) - 3*I)*e^(2/3*I*f*x + 2/3*I*e) + 104*(a^2*d*f*e^(6*I*f*x + 6*I*e)
 - a^2*d*f*e^(5*I*f*x + 5*I*e))*integral(1/13*2^(2/3)*(d/(e^(2*I*f*x + 2*I*
e) + 1))^(2/3)*(-8*I*e^(2*I*f*x + 2*I*e) - 8*I*e^(I*f*x + I*e) - 8*I)*e^(2/
3*I*f*x + 2/3*I*e)/(a^2*d*f*e^(3*I*f*x + 3*I*e) - 2*a^2*d*f*e^(2*I*f*x + 2*
I*e) + a^2*d*f*e^(I*f*x + I*e)), x))/(a^2*d*f*e^(6*I*f*x + 6*I*e) - a^2*d*f
*e^(5*I*f*x + 5*I*e))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}\left(i\,a\tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(1/3)/(a+I*a*tan(f*x+e))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((d*sec(f*x + e))^(1/3)*(I*a*tan(f*x + e) + a)^2), x)
```

maple [F] time = 1.03, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d \sec \left(f x+e\right)\right)^{\frac{1}{3}} \left(a+i a \tan \left(f x+e\right)\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*sec(f*x+e))^(1/3)/(a+I*a*tan(f*x+e))^2,x)
```

```
[Out] int(1/(d*sec(f*x+e))^(1/3)/(a+I*a*tan(f*x+e))^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(1/3)/(a+I*a*tan(f*x+e))^2,x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{1/3}\,{\left(a+a\,\mathrm{tan}\left(e+f\,x\right)\,1{}\mathrm{i}\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d/cos(e + f*x))^(1/3)*(a + a*tan(e + f*x)*1i)^2),x)
```

```
[Out] int(1/((d/cos(e + f*x))^(1/3)*(a + a*tan(e + f*x)*1i)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{1}{\sqrt[3]{d \sec{\left(e+f x \right)}} \tan^{2}{\left(e+f x \right)} - 2 i \sqrt[3]{d \sec{\left(e+f x \right)}} \tan{\left(e+f x \right)} - \sqrt[3]{d \sec{\left(e+f x \right)}}}\, dx}{a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))**(1/3)/(a+I*a*tan(f*x+e))**2,x)
```

```
[Out] -Integral(1/((d*sec(e + f*x))**(1/3)*tan(e + f*x)**2 - 2*I*(d*sec(e + f*x))
**(1/3)*tan(e + f*x) - (d*sec(e + f*x))**(1/3)), x)/a**2
```

3.278 $\int \frac{1}{(d\sec(e+fx))^{5/3}(a+ia\tan(e+fx))^2}\,dx$

Optimal. Leaf size=71

$$-\frac{3i(1+i\tan(e+fx))^{5/6}\,{}_2F_1\left(-\frac{5}{6},\frac{23}{6};\frac{1}{6};\frac{1}{2}(1-i\tan(e+fx))\right)}{20\,2^{5/6}a^2f(d\sec(e+fx))^{5/3}}$$

```
[Out] -3/40*I*hypergeom([-5/6, 23/6],[1/6],1/2-1/2*I*tan(f*x+e))*(1+I*tan(f*x+e))
^(5/6)*2^(1/6)/a^2/f/(d*sec(f*x+e))^(5/3)
```

Rubi [A] time = 0.19, antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3505, 3523, 70, 69}

$$-\frac{3i(1+i\tan(e+fx))^{5/6}\text{Hypergeometric2F1}\left(-\frac{5}{6},\frac{23}{6},\frac{1}{6},\frac{1}{2}(1-i\tan(e+fx))\right)}{20\,2^{5/6}a^2f(d\sec(e+fx))^{5/3}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((d*Sec[e + f*x])^(5/3)*(a + I*a*Tan[e + f*x])^2),x]
```

```
[Out] (((-3*I)/20)*Hypergeometric2F1[-5/6, 23/6, 1/6, (1 - I*Tan[e + f*x])/2]*(1
+ I*Tan[e + f*x])^(5/6))/(2^(5/6)*a^2*f*(d*Sec[e + f*x])^(5/3))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{1}{(d\sec(e+fx))^{5/3}(a+ia\tan(e+fx))^2}\,dx = \frac{\left((a-ia\tan(e+fx))^{5/6}(a+ia\tan(e+fx))^{5/6}\right)\int \frac{}{(a-ia\tan(e+fx))^{5/}}}{(d\sec(e+fx))^{5/3}}$$

$$= \frac{\left(a^2(a-ia\tan(e+fx))^{5/6}(a+ia\tan(e+fx))^{5/6}\right)\text{Subst}\left(\int \frac{}{(a-ia}\right.}{f(d\sec(e+fx))^{5/3}}$$

$$= \frac{\left((a-ia\tan(e+fx))^{5/6}\left(\frac{a+ia\tan(e+fx)}{a}\right)^{5/6}\right)\text{Subst}\left(\int \frac{1}{\left(\frac{1}{2}+\frac{ix}{2}\right)^{23/6}(a-}\right.}{8\,2^{5/6}af(d\sec(e+fx))^{5/3}}$$

$$= -\frac{3i\,{}_2F_1\left(-\frac{5}{6},\frac{23}{6};\frac{1}{6};\frac{1}{2}(1-i\tan(e+fx))\right)(1+i\tan(e+fx))^{5/6}}{20\,2^{5/6}a^2f(d\sec(e+fx))^{5/3}}$$

Mathematica [B] time = 0.91, size = 143, normalized size = 2.01

$$\frac{3i\sec^4(e+fx)\left(128e^{2i(e+fx)}\sqrt[3]{1+e^{2i(e+fx)}}\,{}_2F_1\left(\frac{1}{6},\frac{1}{3};\frac{7}{6};-e^{2i(e+fx)}\right)-10i\sin(2(e+fx))+11i\sin(4(e+fx))-40}{680a^2f(\tan(e+fx)-i)^2(d\sec(e+fx))^{5/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((d*Sec[e + f*x])^(5/3)*(a + I*a*Tan[e + f*x])^2),x]
```

```
[Out] (((3*I)/680)*Sec[e + f*x]^4*(-46 - 40*Cos[2*(e + f*x)] + 6*Cos[4*(e + f*x)]
 + 128*E^((2*I)*(e + f*x))*(1 + E^((2*I)*(e + f*x)))^(1/3)*Hypergeometric2F
1[1/6, 1/3, 7/6, -E^((2*I)*(e + f*x))] - (10*I)*Sin[2*(e + f*x)] + (11*I)*S
in[4*(e + f*x)]))/(a^2*f*(d*Sec[e + f*x])^(5/3)*(-I + Tan[e + f*x])^2)
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\frac{\left(1360\,a^2d^2fe^{(6i\,fx+6i\,e)}\text{integral}\left(-\frac{16i\cdot 2^{\frac{1}{3}}\left(\frac{d}{e^{(2i\,fx+2i\,e)}+1}\right)^{\frac{1}{3}}e^{\left(-\frac{2}{3}i\,fx-\frac{2}{3}i\,e\right)}}{85\,a^2d^2f},x\right)+2^{\frac{1}{3}}\left(\frac{d}{e^{(2i\,fx+2i\,e)}+1}\right)^{\frac{1}{3}}\left(-51i\,e^{(8i\,fx+8i\,e)}+150i\,e\right.\right.}{1360\,a^2d^2f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(5/3)/(a+I*a*tan(f*x+e))^2,x, algorithm="fricas"
)
```

```
[Out] 1/1360*(1360*a^2*d^2*f*e^(6*I*f*x + 6*I*e)*integral(-16/85*I*2^(1/3)*(d/(e^
(2*I*f*x + 2*I*e) + 1))^(1/3)*e^(-2/3*I*f*x - 2/3*I*e)/(a^2*d^2*f), x) + 2^
(1/3)*(d/(e^(2*I*f*x + 2*I*e) + 1))^(1/3)*(-51*I*e^(8*I*f*x + 8*I*e) + 150*
I*e^(6*I*f*x + 6*I*e) + 276*I*e^(4*I*f*x + 4*I*e) + 90*I*e^(2*I*f*x + 2*I*e
) + 15*I)*e^(1/3*I*f*x + 1/3*I*e))*e^(-6*I*f*x - 6*I*e)/(a^2*d^2*f)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}\left(i\,a\tan\left(fx+e\right)+a\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(5/3)/(a+I*a*tan(f*x+e))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((d*sec(f*x + e))^(5/3)*(I*a*tan(f*x + e) + a)^2), x)
```

maple [F] time = 1.04, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}\left(a+ia\tan\left(fx+e\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*sec(f*x+e))^(5/3)/(a+I*a*tan(f*x+e))^2,x)
```

```
[Out] int(1/(d*sec(f*x+e))^(5/3)/(a+I*a*tan(f*x+e))^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(5/3)/(a+I*a*tan(f*x+e))^2,x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{5/3}\,{\left(a+a\,\tan\left(e+f\,x\right)\,1{}\mathrm{i}\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d/cos(e + f*x))^(5/3)*(a + a*tan(e + f*x)*1i)^2),x)
```

```
[Out] int(1/((d/cos(e + f*x))^(5/3)*(a + a*tan(e + f*x)*1i)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{1}{\left(d\sec\left(e+fx\right)\right)^{\frac{5}{3}}\tan^{2}\left(e+fx\right)-2i\left(d\sec\left(e+fx\right)\right)^{\frac{5}{3}}\tan\left(e+fx\right)-\left(d\sec\left(e+fx\right)\right)^{\frac{5}{3}}}\,dx}{a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))**(5/3)/(a+I*a*tan(f*x+e))**2,x)
```

```
[Out] -Integral(1/((d*sec(e + f*x))**(5/3)*tan(e + f*x)**2 - 2*I*(d*sec(e + f*x))
**(5/3)*tan(e + f*x) - (d*sec(e + f*x))**(5/3)), x)/a**2
```

3.279 $\int \sec^8(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=117

$$\frac{2i(a+ia\tan(c+dx))^{15/2}}{15a^7d}-\frac{12i(a+ia\tan(c+dx))^{13/2}}{13a^6d}+\frac{24i(a+ia\tan(c+dx))^{11/2}}{11a^5d}-\frac{16i(a+ia\tan(c+dx))^{9/2}}{9a^4d}$$

```
[Out] -16/9*I*(a+I*a*tan(d*x+c))^(9/2)/a^4/d+24/11*I*(a+I*a*tan(d*x+c))^(11/2)/a^
5/d-12/13*I*(a+I*a*tan(d*x+c))^(13/2)/a^6/d+2/15*I*(a+I*a*tan(d*x+c))^(15/2
)/a^7/d
```

Rubi [A] time = 0.08, antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 43}

$$\frac{2i(a+ia\tan(c+dx))^{15/2}}{15a^7d}-\frac{12i(a+ia\tan(c+dx))^{13/2}}{13a^6d}+\frac{24i(a+ia\tan(c+dx))^{11/2}}{11a^5d}-\frac{16i(a+ia\tan(c+dx))^{9/2}}{9a^4d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^8*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((-16*I)/9)*(a + I*a*Tan[c + d*x])^(9/2))/(a^4*d) + (((24*I)/11)*(a + I*a*
Tan[c + d*x])^(11/2))/(a^5*d) - (((12*I)/13)*(a + I*a*Tan[c + d*x])^(13/2))
/(a^6*d) + (((2*I)/15)*(a + I*a*Tan[c + d*x])^(15/2))/(a^7*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^8(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^3(a+x)^{7/2}\,dx,x,ia\tan(c+dx)\right)}{a^7d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(8a^3(a+x)^{7/2}-12a^2(a+x)^{9/2}+6a(a+x)^{11/2}-(a+x)^1\right.\right.}{a^7d}\\ &= -\frac{16i(a+ia\tan(c+dx))^{9/2}}{9a^4d}+\frac{24i(a+ia\tan(c+dx))^{11/2}}{11a^5d}-\frac{12i(a+ia}{}\end{aligned}$$

Mathematica [A] time = 0.88, size = 95, normalized size = 0.81

$$\frac{2\sec^7(c+dx)\sqrt{a+ia\tan(c+dx)}\,(-3i(90\sin(c+dx)+233\sin(3(c+dx)))+510\cos(c+dx)+731\cos(3(c+}{6435d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^8*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (2*Sec[c + d*x]^7*(510*Cos[c + d*x] + 731*Cos[3*(c + d*x)] - (3*I)*(90*Sin[
c + d*x] + 233*Sin[3*(c + d*x)]))*((-I)*Cos[4*(c + d*x)] + Sin[4*(c + d*x)]
)*Sqrt[a + I*a*Tan[c + d*x]])/(6435*d)
```

fricas [A] time = 0.69, size = 154, normalized size = 1.32

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(-4096i\,e^{(15i\,dx+15i\,c)}-30720i\,e^{(13i\,dx+13i\,c)}-99840i\,e^{(11i\,dx+11i\,c)}-183040i\,e^{(9i\,dx+9i\,c)}\right)}{6435\left(de^{(14i\,dx+14i\,c)}+7\,de^{(12i\,dx+12i\,c)}+21\,de^{(10i\,dx+10i\,c)}+35\,de^{(8i\,dx+8i\,c)}+35\,de^{(6i\,dx+6i\,c)}+21\,de^{(4i\,dx+4i\,c)}+7\,de^{(2i\,c}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/6435*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-4096*I*e^(15*I*d*x + 15*
I*c) - 30720*I*e^(13*I*d*x + 13*I*c) - 99840*I*e^(11*I*d*x + 11*I*c) - 1830
40*I*e^(9*I*d*x + 9*I*c))/(d*e^(14*I*d*x + 14*I*c) + 7*d*e^(12*I*d*x + 12*I
*c) + 21*d*e^(10*I*d*x + 10*I*c) + 35*d*e^(8*I*d*x + 8*I*c) + 35*d*e^(6*I*d
*x + 6*I*c) + 21*d*e^(4*I*d*x + 4*I*c) + 7*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{i\,a\tan\left(dx+c\right)+a}\,\sec\left(dx+c\right)^{8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)*sec(d*x + c)^8, x)
```

maple [A] time = 4.76, size = 141, normalized size = 1.21

$$-\frac{2\left(1024i\left(\cos^{7}\left(dx+c\right)\right)-1024\sin\left(dx+c\right)\left(\cos^{6}\left(dx+c\right)\right)+128i\left(\cos^{5}\left(dx+c\right)\right)-640\sin\left(dx+c\right)\left(\cos^{4}\left(dx+\right.\right.\right.}{6435d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] -2/6435/d*(1024*I*cos(d*x+c)^7-1024*sin(d*x+c)*cos(d*x+c)^6+128*I*cos(d*x+c
)^5-640*sin(d*x+c)*cos(d*x+c)^4+56*I*cos(d*x+c)^3-504*cos(d*x+c)^2*sin(d*x+
c)+33*I*cos(d*x+c)-429*sin(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))
^(1/2)/cos(d*x+c)^7
```

maxima [A] time = 0.53, size = 76, normalized size = 0.65

$$\frac{2i\left(429\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{15}{2}}-2970\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{13}{2}}a+7020\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{11}{2}}a^{2}-5720\left(i\,a\tan\left(dx\right.\right.\right.}{6435\,a^{7}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 2/6435*I*(429*(I*a*tan(d*x + c) + a)^(15/2) - 2970*(I*a*tan(d*x + c) + a)^(
13/2)*a + 7020*(I*a*tan(d*x + c) + a)^(11/2)*a^2 - 5720*(I*a*tan(d*x + c) +
 a)^(9/2)*a^3)/(a^7*d)
```

mupad [B] time = 12.12, size = 474, normalized size = 4.05

$$-\frac{\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,4096i}{6435\,d}-\frac{\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,2048i}{6435\,d\,\left(e^{c\,2i+d\,x\,2i}+1\right)}-\frac{\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,512i}{2145\,d\,\left(e^{c\,2i+d\,x\,2i}+1\right)^{2}}-\frac{\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}}{1287\,d\,\left(e^{c\,2i+d\,x\,2i}+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(1/2)/cos(c + d*x)^8,x)
```

```
[Out] ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*4
0960i)/(1287*d*(exp(c*2i + d*x*2i) + 1)^4) - ((a - (a*(exp(c*2i + d*x*2i)*1
i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*2048i)/(6435*d*(exp(c*2i + d*x*
2i) + 1)) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) +
 1))^(1/2)*512i)/(2145*d*(exp(c*2i + d*x*2i) + 1)^2) - ((a - (a*(exp(c*2i +
 d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*256i)/(1287*d*(exp(c*
2i + d*x*2i) + 1)^3) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i
+ d*x*2i) + 1))^(1/2)*4096i)/(6435*d) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1
i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*52736i)/(715*d*(exp(c*2i + d*x*2i) +
 1)^5) + ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1)
)^(1/2)*11776i)/(195*d*(exp(c*2i + d*x*2i) + 1)^6) - ((a - (a*(exp(c*2i + d
*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*256i)/(15*d*(exp(c*2i +
 d*x*2i) + 1)^7)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{ia\left(\tan\left(c+dx\right)-i\right)}\,\sec^{8}\left(c+dx\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8*(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(I*a*(tan(c + d*x) - I))*sec(c + d*x)**8, x)
```

3.280 $\int \sec^6(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=88

$$-\frac{2i(a+ia\tan(c+dx))^{11/2}}{11a^5d}+\frac{8i(a+ia\tan(c+dx))^{9/2}}{9a^4d}-\frac{8i(a+ia\tan(c+dx))^{7/2}}{7a^3d}$$

```
[Out] -8/7*I*(a+I*a*tan(d*x+c))^(7/2)/a^3/d+8/9*I*(a+I*a*tan(d*x+c))^(9/2)/a^4/d-
2/11*I*(a+I*a*tan(d*x+c))^(11/2)/a^5/d
```

Rubi [A] time = 0.07, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 43}

$$-\frac{2i(a+ia\tan(c+dx))^{11/2}}{11a^5d}+\frac{8i(a+ia\tan(c+dx))^{9/2}}{9a^4d}-\frac{8i(a+ia\tan(c+dx))^{7/2}}{7a^3d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((-8*I)/7)*(a + I*a*Tan[c + d*x])^(7/2))/(a^3*d) + (((8*I)/9)*(a + I*a*Tan
[c + d*x])^(9/2))/(a^4*d) - (((2*I)/11)*(a + I*a*Tan[c + d*x])^(11/2))/(a^5
*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^6(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx&=-\frac{i\,\text{Subst}\left(\int (a-x)^2(a+x)^{5/2}\,dx,x,ia\tan(c+dx)\right)}{a^5d}\\&=-\frac{i\,\text{Subst}\left(\int \left(4a^2(a+x)^{5/2}-4a(a+x)^{7/2}+(a+x)^{9/2}\right)dx,x,ia\tan(c+a\right.}{a^5d}\\&=-\frac{8i(a+ia\tan(c+dx))^{7/2}}{7a^3d}+\frac{8i(a+ia\tan(c+dx))^{9/2}}{9a^4d}-\frac{2i(a+ia\tan(c+}{11a^5d}\end{aligned}$$

Mathematica [A] time = 0.44, size = 77, normalized size = 0.88

$$\frac{2\sec^5(c+dx)\sqrt{a+ia\tan(c+dx)}\,(-91i\sin(2(c+dx))+107\cos(2(c+dx))+44)(\sin(3(c+dx))-i\cos(3(c+dx}{693d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (2*Sec[c + d*x]^5*(44 + 107*Cos[2*(c + d*x)] - (91*I)*Sin[2*(c + d*x)])*((-
I)*Cos[3*(c + d*x)] + Sin[3*(c + d*x)])*Sqrt[a + I*a*Tan[c + d*x]])/(693*d)
```

fricas [A] time = 0.48, size = 119, normalized size = 1.35

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(-512i\,e^{(11i\,dx+11i\,c)}-2816i\,e^{(9i\,dx+9i\,c)}-6336i\,e^{(7i\,dx+7i\,c)}\right)}{693\left(de^{(10i\,dx+10i\,c)}+5\,de^{(8i\,dx+8i\,c)}+10\,de^{(6i\,dx+6i\,c)}+10\,de^{(4i\,dx+4i\,c)}+5\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/693*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-512*I*e^(11*I*d*x + 11*I*
c) - 2816*I*e^(9*I*d*x + 9*I*c) - 6336*I*e^(7*I*d*x + 7*I*c))/(d*e^(10*I*d*
x + 10*I*c) + 5*d*e^(8*I*d*x + 8*I*c) + 10*d*e^(6*I*d*x + 6*I*c) + 10*d*e^(
4*I*d*x + 4*I*c) + 5*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{i\,a\tan\left(dx+c\right)+a}\,\sec\left(dx+c\right)^{6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)*sec(d*x + c)^6, x)
```

maple [A] time = 1.43, size = 114, normalized size = 1.30

$$-\frac{2\left(128i\left(\cos^{5}\left(dx+c\right)\right)-128\sin\left(dx+c\right)\left(\cos^{4}\left(dx+c\right)\right)+16i\left(\cos^{3}\left(dx+c\right)\right)-80\left(\cos^{2}\left(dx+c\right)\right)\sin\left(dx+c\right.}{693d\cos\left(dx+c\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] -2/693/d*(128*I*cos(d*x+c)^5-128*sin(d*x+c)*cos(d*x+c)^4+16*I*cos(d*x+c)^3-
80*cos(d*x+c)^2*sin(d*x+c)+7*I*cos(d*x+c)-63*sin(d*x+c))*(a*(I*sin(d*x+c)+c
os(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^5
```

maxima [A] time = 0.41, size = 58, normalized size = 0.66

$$-\frac{2i\left(63\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{11}{2}}-308\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{9}{2}}a+396\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{7}{2}}a^{2}\right)}{693\,a^{5}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -2/693*I*(63*(I*a*tan(d*x + c) + a)^(11/2) - 308*(I*a*tan(d*x + c) + a)^(9/
2)*a + 396*(I*a*tan(d*x + c) + a)^(7/2)*a^2)/(a^5*d)
```

mupad [B] time = 7.01, size = 352, normalized size = 4.00

$$-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,512\mathrm{i}}{693\,d}-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,256\mathrm{i}}{693\,d\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,64\mathrm{i}}{231\,d\,{\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}^2}+\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}}{693\,d\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(1/2)/cos(c + d*x)^6,x)
```

```
[Out] ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*7
232i)/(693*d*(exp(c*2i + d*x*2i) + 1)^3) - ((a - (a*(exp(c*2i + d*x*2i)*1i
- 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*256i)/(693*d*(exp(c*2i + d*x*2i)
+ 1)) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))
^(1/2)*64i)/(231*d*(exp(c*2i + d*x*2i) + 1)^2) - ((a - (a*(exp(c*2i + d*x*2
i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*512i)/(693*d) - ((a - (a*(e
xp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*1472i)/(99*d
*(exp(c*2i + d*x*2i) + 1)^4) + ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(e
xp(c*2i + d*x*2i) + 1))^(1/2)*64i)/(11*d*(exp(c*2i + d*x*2i) + 1)^5)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{ia\left(\tan\left(c+dx\right)-i\right)}\,\sec^{6}\left(c+dx\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6*(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(I*a*(tan(c + d*x) - I))*sec(c + d*x)**6, x)
```

3.281 $\int \sec^4(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=59

$$\frac{2i(a+ia\tan(c+dx))^{7/2}}{7a^3d}-\frac{4i(a+ia\tan(c+dx))^{5/2}}{5a^2d}$$

```
[Out] -4/5*I*(a+I*a*tan(d*x+c))^(5/2)/a^2/d+2/7*I*(a+I*a*tan(d*x+c))^(7/2)/a^3/d
```

Rubi [A] time = 0.06, antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 43}

$$\frac{2i(a+ia\tan(c+dx))^{7/2}}{7a^3d}-\frac{4i(a+ia\tan(c+dx))^{5/2}}{5a^2d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((-4*I)/5)*(a + I*a*Tan[c + d*x])^(5/2))/(a^2*d) + (((2*I)/7)*(a + I*a*Tan
[c + d*x])^(7/2))/(a^3*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^4(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)(a+x)^{3/2}\,dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(2a(a+x)^{3/2}-(a+x)^{5/2}\right)dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{4i(a+ia\tan(c+dx))^{5/2}}{5a^2d}+\frac{2i(a+ia\tan(c+dx))^{7/2}}{7a^3d}\end{aligned}$$

Mathematica [A] time = 0.35, size = 58, normalized size = 0.98

$$\frac{2\sqrt{a+ia\tan(c+dx)}\left(8(\tan(c+dx)-i)+(5\tan(c+dx)-i)\sec^2(c+dx)\right)}{35d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (2*Sqrt[a + I*a*Tan[c + d*x]]*(8*(-I + Tan[c + d*x]) + Sec[c + d*x]^2*(-I +
 5*Tan[c + d*x])))/(35*d)
```

fricas [A] time = 0.46, size = 84, normalized size = 1.42

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(-32i\,e^{(7i\,dx+7i\,c)}-112i\,e^{(5i\,dx+5i\,c)}\right)}{35\left(de^{(6i\,dx+6i\,c)}+3\,de^{(4i\,dx+4i\,c)}+3\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/35*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-32*I*e^(7*I*d*x + 7*I*c) -
 112*I*e^(5*I*d*x + 5*I*c))/(d*e^(6*I*d*x + 6*I*c) + 3*d*e^(4*I*d*x + 4*I*c
) + 3*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{i\,a\tan\left(dx+c\right)+a}\,\sec\left(dx+c\right)^{4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)*sec(d*x + c)^4, x)
```

maple [A] time = 1.42, size = 87, normalized size = 1.47

$$-\frac{2\left(8i\left(\cos^{3}\left(dx+c\right)\right)-8\left(\cos^{2}\left(dx+c\right)\right)\sin\left(dx+c\right)+i\cos\left(dx+c\right)-5\sin\left(dx+c\right)\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}}{35d\cos\left(dx+c\right)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] -2/35/d*(8*I*cos(d*x+c)^3-8*cos(d*x+c)^2*sin(d*x+c)+I*cos(d*x+c)-5*sin(d*x+
c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^3
```

maxima [A] time = 0.54, size = 40, normalized size = 0.68

$$\frac{2i\left(5\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{7}{2}}-14\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{5}{2}}a\right)}{35\,a^{3}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 2/35*I*(5*(I*a*tan(d*x + c) + a)^(7/2) - 14*(I*a*tan(d*x + c) + a)^(5/2)*a)
/(a^3*d)
```

mupad [B] time = 6.25, size = 230, normalized size = 3.90

$$-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,32\mathrm{i}}{35\,d}-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,16\mathrm{i}}{35\,d\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}+\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,128\mathrm{i}}{35\,d\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)^{2}}-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,16\mathrm{i}}{7\,d\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(1/2)/cos(c + d*x)^4,x)
```

```
[Out] ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*1
28i)/(35*d*(exp(c*2i + d*x*2i) + 1)^2) - ((a - (a*(exp(c*2i + d*x*2i)*1i -
```

```
1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*16i)/(35*d*(exp(c*2i + d*x*2i) + 1)
) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/
2)*32i)/(35*d) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*
2i) + 1))^(1/2)*16i)/(7*d*(exp(c*2i + d*x*2i) + 1)^3)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{ia(\tan(c + dx) - i)}\sec^4(c + dx)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4*(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(I*a*(tan(c + d*x) - I))*sec(c + d*x)**4, x)
```

3.282 $\int \sec^2(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=29

$$-\frac{2i(a+ia\tan(c+dx))^{3/2}}{3ad}$$

[Out] -2/3*I*(a+I*a*tan(d*x+c))^(3/2)/a/d

Rubi [A] time = 0.06, antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 32}

$$-\frac{2i(a+ia\tan(c+dx))^{3/2}}{3ad}$$

Antiderivative was successfully verified.

[In] Int[Sec[c + d*x]^2*Sqrt[a + I*a*Tan[c + d*x]],x]

[Out] (((-2*I)/3)*(a + I*a*Tan[c + d*x])^(3/2))/(a*d)

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^2(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx &= -\frac{i\,\text{Subst}\left(\int \sqrt{a+x}\,dx, x, ia\tan(c+dx)\right)}{ad}\\ &= -\frac{2i(a+ia\tan(c+dx))^{3/2}}{3ad}\end{aligned}$$

Mathematica [A] time = 0.18, size = 34, normalized size = 1.17

$$\frac{2(\tan(c+dx)-i)\sqrt{a+ia\tan(c+dx)}}{3d}$$

Antiderivative was successfully verified.

[In] Integrate[Sec[c + d*x]^2*Sqrt[a + I*a*Tan[c + d*x]],x]

[Out] (2*(-I + Tan[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])/(3*d)

fricas [B] time = 0.47, size = 46, normalized size = 1.59

$$-\frac{4i\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\,e^{(3i\,dx+3i\,c)}}{3\left(de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] -4/3*I*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(3*I*d*x + 3*I*c)/(d*e^(
2*I*d*x + 2*I*c) + d)
```

giac [B] time = 2.14, size = 55, normalized size = 1.90

$$-\frac{2i\left(\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-2ia\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-a}{\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1}\right)^{\frac{3}{2}}}{3ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] -2/3*I*((a*tan(1/2*d*x + 1/2*c)^2 - 2*I*a*tan(1/2*d*x + 1/2*c) - a)/(tan(1/
2*d*x + 1/2*c)^2 - 1))^(3/2)/(a*d)
```

maple [A] time = 0.24, size = 24, normalized size = 0.83

$$-\frac{2i\left(a+ia\tan\left(dx+c\right)\right)^{\frac{3}{2}}}{3da}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] -2/3*I*(a+I*a*tan(d*x+c))^(3/2)/d/a
```

maxima [A] time = 0.42, size = 21, normalized size = 0.72

$$-\frac{2i\left(ia\tan\left(dx+c\right)+a\right)^{\frac{3}{2}}}{3ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -2/3*I*(I*a*tan(d*x + c) + a)^(3/2)/(a*d)
```

mupad [B] time = 0.58, size = 82, normalized size = 2.83

$$-\frac{\left(\cos\left(2c+2dx\right)+1+\sin\left(2c+2dx\right)1\mathrm{i}\right)\sqrt{\frac{a\left(\cos(2c+2dx)+1+\sin(2c+2dx)1\mathrm{i}\right)}{\cos(2c+2dx)+1}}\,2\mathrm{i}}{3d\left(\cos\left(2c+2dx\right)+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(1/2)/cos(c + d*x)^2,x)
```

```
[Out] -((cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1)*((a*(cos(2*c + 2*d*x) + sin(
2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1))^(1/2)*2i)/(3*d*(cos(2*c + 2*d
*x) + 1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{ia\left(\tan\left(c+dx\right)-i\right)}\sec^2\left(c+dx\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2*(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(I*a*(tan(c + d*x) - I))*sec(c + d*x)**2, x)
```

3.283 $\int \cos^2(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=120

$$-\frac{ia^2}{2d(a-ia\tan(c+dx))\sqrt{a+ia\tan(c+dx)}}+\frac{3ia}{4d\sqrt{a+ia\tan(c+dx)}}-\frac{3i\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{4\sqrt{2}d}$$

```
[Out] -3/8*I*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))*a^(1/2)/d*2^(1
/2)+3/4*I*a/d/(a+I*a*tan(d*x+c))^(1/2)-1/2*I*a^2/d/(a+I*a*tan(d*x+c))^(1/2)
/(a-I*a*tan(d*x+c))
```

Rubi [A] time = 0.10, antiderivative size = 120, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3487, 51, 63, 206}

$$-\frac{ia^2}{2d(a-ia\tan(c+dx))\sqrt{a+ia\tan(c+dx)}}+\frac{3ia}{4d\sqrt{a+ia\tan(c+dx)}}-\frac{3i\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{4\sqrt{2}d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((-3*I)/4)*Sqrt[a]*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a])])/
(Sqrt[2]*d) + (((3*I)/4)*a)/(d*Sqrt[a + I*a*Tan[c + d*x]]) - ((I/2)*a^2)/(d
*(a - I*a*Tan[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^2(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx = -\frac{(ia^3)\,\text{Subst}\left(\int \frac{1}{(a-x)^2(a+x)^{3/2}}\,dx, x, ia\tan(c+dx)\right)}{d}$$
$$= -\frac{ia^2}{2d(a-ia\tan(c+dx))\sqrt{a+ia\tan(c+dx)}} - \frac{(3ia^2)\,\text{Subst}\left(\int \frac{1}{(a-x)(a}\right.}{}$$
$$= \frac{3ia}{4d\sqrt{a+ia\tan(c+dx)}} - \frac{ia^2}{2d(a-ia\tan(c+dx))\sqrt{a+ia\tan(c+dx)}}$$
$$= \frac{3ia}{4d\sqrt{a+ia\tan(c+dx)}} - \frac{ia^2}{2d(a-ia\tan(c+dx))\sqrt{a+ia\tan(c+dx)}}$$
$$= -\frac{3i\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{4\sqrt{2}d} + \frac{3ia}{4d\sqrt{a+ia\tan(c+dx)}} - \frac{}{2d(a-ia}$$

Mathematica [A] time = 0.49, size = 105, normalized size = 0.88

$$-\frac{ie^{-2i(c+dx)}\left(-e^{2i(c+dx)}+e^{4i(c+dx)}+3e^{i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\sinh^{-1}\left(e^{i(c+dx)}\right)-2\right)\sqrt{a+ia\tan(c+dx)}}{8d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((-1/8*I)*(-2 - E^((2*I)*(c + d*x)) + E^((4*I)*(c + d*x)) + 3*E^(I*(c + d*x
))*Sqrt[1 + E^((2*I)*(c + d*x))]*ArcSinh[E^(I*(c + d*x))])*Sqrt[a + I*a*Tan
[c + d*x]])/(d*E^((2*I)*(c + d*x)))
```

fricas [B] time = 0.53, size = 252, normalized size = 2.10

$$\left(3\sqrt{\frac{1}{2}}d\sqrt{-\frac{a}{d^2}}e^{(idx+ic)}\log\left(\frac{1}{2}\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(8ide^{(2idx+2ic)}+8id\right)\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\sqrt{-\frac{a}{d^2}}+8ae^{(idx+ic)}\right)e^{(-idx-ic)}\right)-3\sqrt{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/8*(3*sqrt(1/2)*d*sqrt(-a/d^2)*e^(I*d*x + I*c)*log(1/2*(sqrt(2)*sqrt(1/2)*
(8*I*d*e^(2*I*d*x + 2*I*c) + 8*I*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(
-a/d^2) + 8*a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) - 3*sqrt(1/2)*d*sqrt(-a/d^
2)*e^(I*d*x + I*c)*log(1/2*(sqrt(2)*sqrt(1/2)*(-8*I*d*e^(2*I*d*x + 2*I*c) -
 8*I*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(-a/d^2) + 8*a*e^(I*d*x + I*c
))*e^(-I*d*x - I*c)) + sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-I*e^(4*I
*d*x + 4*I*c) + I*e^(2*I*d*x + 2*I*c) + 2*I))*e^(-I*d*x - I*c)/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{i\,a\tan(dx+c)+a}\,\cos(dx+c)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)*cos(d*x + c)^2, x)
```

maple [B] time = 1.29, size = 397, normalized size = 3.31

$$\left(3i\sin\left(dx+c\right)\cos\left(dx+c\right)\operatorname{arctanh}\left(\frac{\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\,\sin(dx+c)\sqrt{2}}{2\cos(dx+c)}\right)\left(-\frac{2\cos(dx+c)}{1+\cos(dx+c)}\right)^{\frac{3}{2}}\sqrt{2}+3i\operatorname{arctanh}\left(\frac{\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\,\sin(d}{2\cos(dx+c)}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 1/16/d*(3*I*sin(d*x+c)*cos(d*x+c)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(3/2)
*2^(1/2)+3*I*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/co
s(d*x+c)*2^(1/2))*2^(1/2)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(3/2)*sin(d*x+c)+3
*sin(d*x+c)*cos(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(3/2)*arctan(1/2*(-2*
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)+3*2^(1/2)*arctan(1/2*(-2*
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(3
/2)*sin(d*x+c)-8*I*cos(d*x+c)^4-4*I*cos(d*x+c)^3+8*cos(d*x+c)^3*sin(d*x+c)+
12*I*cos(d*x+c)^2-12*cos(d*x+c)^2*sin(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/
cos(d*x+c))^(1/2)/(I*sin(d*x+c)+cos(d*x+c)-1)/cos(d*x+c)
```

maxima [A] time = 0.52, size = 122, normalized size = 1.02

$$\frac{i\left(3\sqrt{2}\,a^{\frac{3}{2}}\log\left(-\frac{\sqrt{2}\,\sqrt{a}-\sqrt{i\,a\tan(dx+c)+a}}{\sqrt{2}\,\sqrt{a}+\sqrt{i\,a\tan(dx+c)+a}}\right)+\frac{4\left(3\,(i\,a\tan(dx+c)+a)a^2-4\,a^3\right)}{(i\,a\tan(dx+c)+a)^{\frac{3}{2}}-2\,\sqrt{i\,a\tan(dx+c)+a}\,a}\right)}{16\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/16*I*(3*sqrt(2)*a^(3/2)*log(-(sqrt(2)*sqrt(a) - sqrt(I*a*tan(d*x + c) + a
))/(sqrt(2)*sqrt(a) + sqrt(I*a*tan(d*x + c) + a))) + 4*(3*(I*a*tan(d*x + c)
 + a)*a^2 - 4*a^3)/((I*a*tan(d*x + c) + a)^(3/2) - 2*sqrt(I*a*tan(d*x + c)
+ a)*a))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \cos\left(c+d\,x\right)^2\,\sqrt{a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] int(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{ia\left(\tan\left(c+dx\right)-i\right)}\,\cos^2\left(c+dx\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2*(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(I*a*(tan(c + d*x) - I))*cos(c + d*x)**2, x)
```

3.284 $\int \cos^4(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=193

$$-\frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{3/2}}-\frac{7ia^3}{16d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{3/2}}+\frac{35ia}{96d(a+ia\tan}$$

```
[Out] -35/128*I*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))*a^(1/2)/d*2
^(1/2)+35/64*I*a/d/(a+I*a*tan(d*x+c))^(1/2)+35/96*I*a^2/d/(a+I*a*tan(d*x+c)
)^(3/2)-1/4*I*a^4/d/(a-I*a*tan(d*x+c))^2/(a+I*a*tan(d*x+c))^(3/2)-7/16*I*a^
3/d/(a-I*a*tan(d*x+c))/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.11, antiderivative size = 193, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3487, 51, 63, 206}

$$-\frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{3/2}}-\frac{7ia^3}{16d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{3/2}}+\frac{35ia}{96d(a+ia\tan}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((-35*I)/64)*Sqrt[a]*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a])]
)/(Sqrt[2]*d) + (((35*I)/96)*a^2)/(d*(a + I*a*Tan[c + d*x])^(3/2)) - ((I/4)
*a^4)/(d*(a - I*a*Tan[c + d*x])^2*(a + I*a*Tan[c + d*x])^(3/2)) - (((7*I)/1
6)*a^3)/(d*(a - I*a*Tan[c + d*x])*(a + I*a*Tan[c + d*x])^(3/2)) + (((35*I)/
64)*a)/(d*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] && !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^4(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx = -\frac{\left(ia^5\right)\text{Subst}\left(\int \frac{1}{(a-x)^3(a+x)^{5/2}}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{3/2}} - \frac{\left(7ia^4\right)\text{Subst}\left(\int \frac{1}{(a-x)^2(}\right.}{}$$

$$= -\frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{3/2}} - \frac{7i}{16d(a-ia\tan(c+dx)}$$

$$= \frac{35ia^2}{96d(a+ia\tan(c+dx))^{3/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^3}$$

$$= \frac{35ia^2}{96d(a+ia\tan(c+dx))^{3/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^3}$$

$$= \frac{35ia^2}{96d(a+ia\tan(c+dx))^{3/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^3}$$

$$= -\frac{35i\sqrt{a}\,\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{64\sqrt{2}\,d} + \frac{35ia^2}{96d(a+ia\tan(c+dx))^{3/2}} - \frac{}{4d(a-}$$

Mathematica [A] time = 0.46, size = 133, normalized size = 0.69

$$-\frac{ie^{-4i(c+dx)}\left(-88e^{2i(c+dx)} - 41e^{4i(c+dx)} + 45e^{6i(c+dx)} + 6e^{8i(c+dx)} + 105e^{3i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\,\sinh^{-1}\left(e^{i(c+dx)}\right) - 8\right)\sqrt{a}}{384d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((-1/384*I)*(-8 - 88*E^((2*I)*(c + d*x)) - 41*E^((4*I)*(c + d*x)) + 45*E^((
6*I)*(c + d*x)) + 6*E^((8*I)*(c + d*x)) + 105*E^((3*I)*(c + d*x))*Sqrt[1 +
E^((2*I)*(c + d*x))]*ArcSinh[E^(I*(c + d*x))])*Sqrt[a + I*a*Tan[c + d*x]])/
(d*E^((4*I)*(c + d*x)))
```

fricas [A] time = 1.39, size = 274, normalized size = 1.42

$$\frac{\left(105\sqrt{\frac{1}{2}}\,d\sqrt{-\frac{a}{d^2}}\,e^{(3i\,dx+3i\,c)}\log\left(\frac{1}{32}\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(128i\,de^{(2i\,dx+2i\,c)}+128i\,d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{-\frac{a}{d^2}}+128\,ae^{(i\,dx+i\,c)}\right)e^{(-i\,dx-i\,c}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/384*(105*sqrt(1/2)*d*sqrt(-a/d^2)*e^(3*I*d*x + 3*I*c)*log(1/32*(sqrt(2)*s
qrt(1/2)*(128*I*d*e^(2*I*d*x + 2*I*c) + 128*I*d)*sqrt(a/(e^(2*I*d*x + 2*I*c
) + 1))*sqrt(-a/d^2) + 128*a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) - 105*sqrt(
1/2)*d*sqrt(-a/d^2)*e^(3*I*d*x + 3*I*c)*log(1/32*(sqrt(2)*sqrt(1/2)*(-128*I
*d*e^(2*I*d*x + 2*I*c) - 128*I*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(-a
/d^2) + 128*a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) + sqrt(2)*sqrt(a/(e^(2*I*d
*x + 2*I*c) + 1))*(-6*I*e^(8*I*d*x + 8*I*c) - 45*I*e^(6*I*d*x + 6*I*c) + 41
*I*e^(4*I*d*x + 4*I*c) + 88*I*e^(2*I*d*x + 2*I*c) + 8*I))*e^(-3*I*d*x - 3*I
*c)/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{i\,a\tan\left(dx+c\right)+a}\,\cos\left(dx+c\right)^{4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)*cos(d*x + c)^4, x)
```

maple [B] time = 1.35, size = 741, normalized size = 3.84

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^(1/2),x)
[Out] -1/3072/d*(128*I*cos(d*x+c)^7-105*cos(d*x+c)^3*2^(1/2)*sin(d*x+c)*arctan(1/
2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c
)))^(7/2)-1680*I*cos(d*x+c)^4-315*cos(d*x+c)^2*2^(1/2)*sin(d*x+c)*arctan(1/
2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c
)))^(7/2)+224*I*cos(d*x+c)^6-315*cos(d*x+c)*2^(1/2)*sin(d*x+c)*arctan(1/2*(
-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))
^(7/2)+560*I*cos(d*x+c)^5-105*2^(1/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(7/2)*sin(d*x+c)-315*I*c
os(d*x+c)^2*2^(1/2)*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(7/2)*arctanh
(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))-10
5*I*cos(d*x+c)^3*2^(1/2)*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(7/2)*ar
ctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2
))-768*sin(d*x+c)*cos(d*x+c)^7-105*I*2^(1/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+
cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x
+c)))^(7/2)*sin(d*x+c)+896*sin(d*x+c)*cos(d*x+c)^6-315*I*cos(d*x+c)*2^(1/2)
*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(7/2)*arctanh(1/2*(-2*cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))-1120*cos(d*x+c)^5*sin
(d*x+c)+768*I*cos(d*x+c)^8+1680*sin(d*x+c)*cos(d*x+c)^4)*(a*(I*sin(d*x+c)+c
os(d*x+c))/cos(d*x+c))^(1/2)/(I*sin(d*x+c)+cos(d*x+c)-1)/cos(d*x+c)^3
```

maxima [A] time = 0.85, size = 176, normalized size = 0.91

$$\frac{i\left(105\,\sqrt{2}\,a^{\frac{3}{2}}\log\left(-\frac{\sqrt{2}\,\sqrt{a}-\sqrt{i\,a\tan\left(dx+c\right)+a}}{\sqrt{2}\,\sqrt{a}+\sqrt{i\,a\tan\left(dx+c\right)+a}}\right)+\frac{4\left(105\left(i\,a\tan\left(dx+c\right)+a\right)^{3}a^{2}-350\left(i\,a\tan\left(dx+c\right)+a\right)^{2}a^{3}+224\left(i\,a\tan\left(dx+c\right)+a\right)a^{4}+64\,a^{5}\right)}{\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{7}{2}}-4\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{5}{2}}a+4\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{3}{2}}a^{2}}\right)}{768\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
[Out] 1/768*I*(105*sqrt(2)*a^(3/2)*log(-(sqrt(2)*sqrt(a) - sqrt(I*a*tan(d*x + c)
+ a))/(sqrt(2)*sqrt(a) + sqrt(I*a*tan(d*x + c) + a))) + 4*(105*(I*a*tan(d*x
 + c) + a)^3*a^2 - 350*(I*a*tan(d*x + c) + a)^2*a^3 + 224*(I*a*tan(d*x + c)
 + a)*a^4 + 64*a^5)/((I*a*tan(d*x + c) + a)^(7/2) - 4*(I*a*tan(d*x + c) + a
)^(5/2)*a + 4*(I*a*tan(d*x + c) + a)^(3/2)*a^2))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\cos\left(c+d\,x\right)}^4\,\sqrt{a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] int(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F]   time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{ia\left(\tan\left(c+dx\right)-i\right)}\,\cos^{4}\left(c+dx\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4*(a+I*a*tan(d*x+c))**(1/2),x)
[Out] Integral(sqrt(I*a*(tan(c + d*x) - I))*cos(c + d*x)**4, x)
```

3.285 $\int \cos^6(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=266

$$-\frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{5/2}}-\frac{11ia^5}{48d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{5/2}}-\frac{}{64d(a-ia\tan}$$

```
[Out] -231/1024*I*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))*a^(1/2)/d
*2^(1/2)+231/512*I*a/d/(a+I*a*tan(d*x+c))^(1/2)+231/640*I*a^3/d/(a+I*a*tan(
d*x+c))^(5/2)-1/6*I*a^6/d/(a-I*a*tan(d*x+c))^3/(a+I*a*tan(d*x+c))^(5/2)-11/
48*I*a^5/d/(a-I*a*tan(d*x+c))^2/(a+I*a*tan(d*x+c))^(5/2)-33/64*I*a^4/d/(a-I
*a*tan(d*x+c))/(a+I*a*tan(d*x+c))^(5/2)+77/256*I*a^2/d/(a+I*a*tan(d*x+c))^(
3/2)
```

Rubi [A] time = 0.14, antiderivative size = 266, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {3487, 51, 63, 206}

$$-\frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{5/2}}-\frac{11ia^5}{48d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{5/2}}-\frac{}{64d(a-ia\tan}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^6*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((-231*I)/512)*Sqrt[a]*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a]
)])/(Sqrt[2]*d) + (((231*I)/640)*a^3)/(d*(a + I*a*Tan[c + d*x])^(5/2)) - ((
I/6)*a^6)/(d*(a - I*a*Tan[c + d*x])^3*(a + I*a*Tan[c + d*x])^(5/2)) - (((11
*I)/48)*a^5)/(d*(a - I*a*Tan[c + d*x])^2*(a + I*a*Tan[c + d*x])^(5/2)) - ((
(33*I)/64)*a^4)/(d*(a - I*a*Tan[c + d*x])*(a + I*a*Tan[c + d*x])^(5/2)) + (
((77*I)/256)*a^2)/(d*(a + I*a*Tan[c + d*x])^(3/2)) + (((231*I)/512)*a)/(d*S
qrt[a + I*a*Tan[c + d*x]])
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^6(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx = -\frac{\left(ia^7\right)\text{Subst}\left(\int \frac{1}{(a-x)^4(a+x)^{7/2}}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{5/2}} - \frac{\left(11ia^6\right)\text{Subst}\left(\int \frac{}{(a-x)^3}\right.}{}$$

$$= -\frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{5/2}} - \frac{11}{48d(a-ia\tan(c+dx)}$$

$$= -\frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{5/2}} - \frac{11}{48d(a-ia\tan(c+dx)}$$

$$= \frac{231ia^3}{640d(a+ia\tan(c+dx))^{5/2}} - \frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx)}$$

$$= \frac{231ia^3}{640d(a+ia\tan(c+dx))^{5/2}} - \frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx)}$$

$$= \frac{231ia^3}{640d(a+ia\tan(c+dx))^{5/2}} - \frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx)}$$

$$= \frac{231ia^3}{640d(a+ia\tan(c+dx))^{5/2}} - \frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx)}$$

$$= -\frac{231i\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{512\sqrt{2}d} + \frac{231ia^3}{640d(a+ia\tan(c+dx))^{5/2}} - \frac{}{6d(a}$$

Mathematica [A] time = 0.78, size = 159, normalized size = 0.60

$$-\frac{ie^{-6i(c+dx)}\left(-464e^{2i(c+dx)} - 3184e^{4i(c+dx)} - 1433e^{6i(c+dx)} + 1645e^{8i(c+dx)} + 350e^{10i(c+dx)} + 40e^{12i(c+dx)} + 3465e^{5i(c+dx}\right.}{15360d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^6*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((-1/15360*I)*(-48 - 464*E^((2*I)*(c + d*x)) - 3184*E^((4*I)*(c + d*x)) - 1
433*E^((6*I)*(c + d*x)) + 1645*E^((8*I)*(c + d*x)) + 350*E^((10*I)*(c + d*x
)) + 40*E^((12*I)*(c + d*x)) + 3465*E^((5*I)*(c + d*x))*Sqrt[1 + E^((2*I)*(
c + d*x))]*ArcSinh[E^(I*(c + d*x))])*Sqrt[a + I*a*Tan[c + d*x]])/(d*E^((6*I
)*(c + d*x)))
```

fricas [A] time = 0.58, size = 296, normalized size = 1.11

$$\left(3465\sqrt{\frac{1}{2}}\,d\sqrt{-\frac{a}{d^2}}\,e^{(5i\,dx+5i\,c)}\log\left(\frac{1}{256}\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(1024i\,de^{(2i\,dx+2i\,c)}+1024i\,d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{-\frac{a}{d^2}}+1024\,ae^{(i\,dx+i\,c)}\right)e^{(}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/15360*(3465*sqrt(1/2)*d*sqrt(-a/d^2)*e^(5*I*d*x + 5*I*c)*log(1/256*(sqrt(
2)*sqrt(1/2)*(1024*I*d*e^(2*I*d*x + 2*I*c) + 1024*I*d)*sqrt(a/(e^(2*I*d*x +
 2*I*c) + 1))*sqrt(-a/d^2) + 1024*a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) - 34
65*sqrt(1/2)*d*sqrt(-a/d^2)*e^(5*I*d*x + 5*I*c)*log(1/256*(sqrt(2)*sqrt(1/2
)*(-1024*I*d*e^(2*I*d*x + 2*I*c) - 1024*I*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) +
1))*sqrt(-a/d^2) + 1024*a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) + sqrt(2)*sqrt
(a/(e^(2*I*d*x + 2*I*c) + 1))*(-40*I*e^(12*I*d*x + 12*I*c) - 350*I*e^(10*I*
d*x + 10*I*c) - 1645*I*e^(8*I*d*x + 8*I*c) + 1433*I*e^(6*I*d*x + 6*I*c) + 3
184*I*e^(4*I*d*x + 4*I*c) + 464*I*e^(2*I*d*x + 2*I*c) + 48*I))*e^(-5*I*d*x
- 5*I*c)/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{i\,a\tan\left(dx+c\right)+a}\,\cos\left(dx+c\right)^{6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)*cos(d*x + c)^6, x)
```

maple [B] time = 1.43, size = 1085, normalized size = 4.08

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 1/491520/d*(3465*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*arctan(1/2*(-2*cos(d
*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)*sin(d*x+c)-81920*I*cos(d*x+c)^
12-8192*I*cos(d*x+c)^11-11264*I*cos(d*x+c)^10-16896*I*cos(d*x+c)^9-29568*I*
cos(d*x+c)^8-73920*I*cos(d*x+c)^7+221760*I*cos(d*x+c)^6+81920*sin(d*x+c)*co
s(d*x+c)^11+101376*sin(d*x+c)*cos(d*x+c)^9-118272*sin(d*x+c)*cos(d*x+c)^8-9
0112*sin(d*x+c)*cos(d*x+c)^10+3465*sin(d*x+c)*cos(d*x+c)^5*(-2*cos(d*x+c)/(
1+cos(d*x+c)))^(11/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/
2))*2^(1/2)+17325*sin(d*x+c)*cos(d*x+c)^4*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1
1/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)+34650
*sin(d*x+c)*cos(d*x+c)^3*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*arctan(1/2*(
-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)+34650*sin(d*x+c)*cos(d
*x+c)^2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*arctan(1/2*(-2*cos(d*x+c)/(1+
cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)+17325*sin(d*x+c)*cos(d*x+c)*(-2*cos(d*x
+c)/(1+cos(d*x+c)))^(11/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*
2^(1/2))*2^(1/2)+3465*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*arctanh(1/2*(
-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*2^(1/2)*
sin(d*x+c)+147840*sin(d*x+c)*cos(d*x+c)^7-221760*sin(d*x+c)*cos(d*x+c)^6+17
325*I*sin(d*x+c)*cos(d*x+c)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2
)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*2^(1
/2)+3465*I*sin(d*x+c)*cos(d*x+c)^5*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)
))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/
2)*2^(1/2)+17325*I*sin(d*x+c)*cos(d*x+c)^4*arctanh(1/2*(-2*cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c
)))^(11/2)*2^(1/2)+34650*I*sin(d*x+c)*cos(d*x+c)^3*arctanh(1/2*(-2*cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+c
os(d*x+c)))^(11/2)*2^(1/2)+34650*I*sin(d*x+c)*cos(d*x+c)^2*arctanh(1/2*(-2*
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x
+c)/(1+cos(d*x+c)))^(11/2)*2^(1/2))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c)
)^(1/2)/(I*sin(d*x+c)+cos(d*x+c)-1)/cos(d*x+c)^5
```

maxima [A] time = 0.59, size = 230, normalized size = 0.86

$$\frac{i\left(3465\sqrt{2}\,a^{\frac{3}{2}}\log\left(-\frac{\sqrt{2}\sqrt{a}-\sqrt{i a\tan(dx+c)+a}}{\sqrt{2}\sqrt{a}+\sqrt{i a\tan(dx+c)+a}}\right)+\frac{4\left(3465\,(i a\tan(dx+c)+a)^{5}a^{2}-18480\,(i a\tan(dx+c)+a)^{4}a^{3}+30492\,(i a\tan(dx+c)+a)^{3}a^{4}-126\cdots\right.}{(i a\tan(dx+c)+a)^{\frac{11}{2}}-6\,(i a\tan(dx+c)+a)^{\frac{9}{2}}a+12\,(i a\tan(dx+c)\cdots}\right.}{30720\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/30720*I*(3465*sqrt(2)*a^(3/2)*log(-(sqrt(2)*sqrt(a) - sqrt(I*a*tan(d*x +
c) + a))/(sqrt(2)*sqrt(a) + sqrt(I*a*tan(d*x + c) + a))) + 4*(3465*(I*a*tan
(d*x + c) + a)^5*a^2 - 18480*(I*a*tan(d*x + c) + a)^4*a^3 + 30492*(I*a*tan(
d*x + c) + a)^3*a^4 - 12672*(I*a*tan(d*x + c) + a)^2*a^5 - 2816*(I*a*tan(d*
x + c) + a)*a^6 - 1536*a^7)/((I*a*tan(d*x + c) + a)^(11/2) - 6*(I*a*tan(d*x
 + c) + a)^(9/2)*a + 12*(I*a*tan(d*x + c) + a)^(7/2)*a^2 - 8*(I*a*tan(d*x +
 c) + a)^(5/2)*a^3))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \cos\left(c+d\,x\right)^6\,\sqrt{a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}}\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] int(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**6*(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

3.286 $\int \sec^7(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=147

$$\frac{256ia^4\sec^7(c+dx)}{3003d(a+ia\tan(c+dx))^{7/2}}+\frac{64ia^3\sec^7(c+dx)}{429d(a+ia\tan(c+dx))^{5/2}}+\frac{24ia^2\sec^7(c+dx)}{143d(a+ia\tan(c+dx))^{3/2}}+\frac{2ia\sec^7(c+dx)}{13d\sqrt{a+ia\tan(c+d}}$$

```
[Out] 2/13*I*a*sec(d*x+c)^7/d/(a+I*a*tan(d*x+c))^(1/2)+256/3003*I*a^4*sec(d*x+c)^
7/d/(a+I*a*tan(d*x+c))^(7/2)+64/429*I*a^3*sec(d*x+c)^7/d/(a+I*a*tan(d*x+c))
^(5/2)+24/143*I*a^2*sec(d*x+c)^7/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.25, antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3494, 3493}

$$\frac{24ia^2\sec^7(c+dx)}{143d(a+ia\tan(c+dx))^{3/2}}+\frac{64ia^3\sec^7(c+dx)}{429d(a+ia\tan(c+dx))^{5/2}}+\frac{256ia^4\sec^7(c+dx)}{3003d(a+ia\tan(c+dx))^{7/2}}+\frac{2ia\sec^7(c+dx)}{13d\sqrt{a+ia\tan(c+d}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^7*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((256*I)/3003)*a^4*Sec[c + d*x]^7)/(d*(a + I*a*Tan[c + d*x])^(7/2)) + (((6
4*I)/429)*a^3*Sec[c + d*x]^7)/(d*(a + I*a*Tan[c + d*x])^(5/2)) + (((24*I)/1
43)*a^2*Sec[c + d*x]^7)/(d*(a + I*a*Tan[c + d*x])^(3/2)) + (((2*I)/13)*a*Se
c[c + d*x]^7)/(d*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] && !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int \sec^7(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx &= \frac{2ia\sec^7(c+dx)}{13d\sqrt{a+ia\tan(c+dx)}}+\frac{1}{13}(12a)\int\frac{\sec^7(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx\\ &= \frac{24ia^2\sec^7(c+dx)}{143d(a+ia\tan(c+dx))^{3/2}}+\frac{2ia\sec^7(c+dx)}{13d\sqrt{a+ia\tan(c+dx)}}+\frac{1}{143}\left(96a^2\right)\\ &= \frac{64ia^3\sec^7(c+dx)}{429d(a+ia\tan(c+dx))^{5/2}}+\frac{24ia^2\sec^7(c+dx)}{143d(a+ia\tan(c+dx))^{3/2}}+\frac{2ia\,\mathrm{s}}{13d\sqrt{a+}}\\ &= \frac{256ia^4\sec^7(c+dx)}{3003d(a+ia\tan(c+dx))^{7/2}}+\frac{64ia^3\sec^7(c+dx)}{429d(a+ia\tan(c+dx))^{5/2}}+\frac{24}{143d(a}\end{aligned}$$

Mathematica [A] time = 0.67, size = 95, normalized size = 0.65

$$\frac{2\sec^6(c+dx)\sqrt{a+ia\tan(c+dx)}\,(7i(26\sin(c+dx)+59\sin(3(c+dx)))+390\cos(c+dx)+445\cos(3(c+d}{3003d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^7*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (2*Sec[c + d*x]^6*(390*Cos[c + d*x] + 445*Cos[3*(c + d*x)] + (7*I)*(26*Sin[
c + d*x] + 59*Sin[3*(c + d*x)]))*(I*Cos[4*(c + d*x)] + Sin[4*(c + d*x)])*Sq
rt[a + I*a*Tan[c + d*x]])/(3003*d)
```

fricas [A] time = 0.57, size = 132, normalized size = 0.90

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(54912i\,e^{(6i\,dx+6i\,c)}+36608i\,e^{(4i\,dx+4i\,c)}+13312i\,e^{(2i\,dx+2i\,c)}+2048i\right)}{3003\left(de^{(12i\,dx+12i\,c)}+6\,de^{(10i\,dx+10i\,c)}+15\,de^{(8i\,dx+8i\,c)}+20\,de^{(6i\,dx+6i\,c)}+15\,de^{(4i\,dx+4i\,c)}+6\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/3003*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(54912*I*e^(6*I*d*x + 6*I*
c) + 36608*I*e^(4*I*d*x + 4*I*c) + 13312*I*e^(2*I*d*x + 2*I*c) + 2048*I)/(d
*e^(12*I*d*x + 12*I*c) + 6*d*e^(10*I*d*x + 10*I*c) + 15*d*e^(8*I*d*x + 8*I*
c) + 20*d*e^(6*I*d*x + 6*I*c) + 15*d*e^(4*I*d*x + 4*I*c) + 6*d*e^(2*I*d*x +
 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{i\,a\tan\left(dx+c\right)+a}\,\sec\left(dx+c\right)^{7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)*sec(d*x + c)^7, x)
```

maple [A] time = 1.96, size = 141, normalized size = 0.96

$$\frac{2\left(1024i\left(\cos^{7}\left(dx+c\right)\right)+1024\sin\left(dx+c\right)\left(\cos^{6}\left(dx+c\right)\right)-128i\left(\cos^{5}\left(dx+c\right)\right)+384\sin\left(dx+c\right)\left(\cos^{4}\left(dx+c\right.\right.}{3003d\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^7*(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 2/3003/d*(1024*I*cos(d*x+c)^7+1024*sin(d*x+c)*cos(d*x+c)^6-128*I*cos(d*x+c)
^5+384*sin(d*x+c)*cos(d*x+c)^4-40*I*cos(d*x+c)^3+280*cos(d*x+c)^2*sin(d*x+c
)-21*I*cos(d*x+c)+231*sin(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^
(1/2)/cos(d*x+c)^6
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [B] time = 8.35, size = 289, normalized size = 1.97

$$\frac{\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,128\mathrm{i}}{7\,d\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)^{3}}-\frac{\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,128\mathrm{i}}{3\,d\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)^{4}}+\frac{\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,3}{11\,d\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(1/2)/cos(c + d*x)^7,x)
```

```
[Out] (exp(- c*1i - d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i +
d*x*2i) + 1))^(1/2)*128i)/(7*d*(exp(c*2i + d*x*2i) + 1)^3) - (exp(- c*1i -
d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^
(1/2)*128i)/(3*d*(exp(c*2i + d*x*2i) + 1)^4) + (exp(- c*1i - d*x*1i)*(a - (
a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*384i)/(1
1*d*(exp(c*2i + d*x*2i) + 1)^5) - (exp(- c*1i - d*x*1i)*(a - (a*(exp(c*2i +
 d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*128i)/(13*d*(exp(c*2i
 + d*x*2i) + 1)^6)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{ia\left(\tan\left(c+dx\right)-i\right)}\,\sec^{7}\left(c+dx\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**7*(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(I*a*(tan(c + d*x) - I))*sec(c + d*x)**7, x)
```

3.287 $\int \sec^5(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=110

$$\frac{64ia^3\sec^5(c+dx)}{315d(a+ia\tan(c+dx))^{5/2}}+\frac{16ia^2\sec^5(c+dx)}{63d(a+ia\tan(c+dx))^{3/2}}+\frac{2ia\sec^5(c+dx)}{9d\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] 2/9*I*a*sec(d*x+c)^5/d/(a+I*a*tan(d*x+c))^(1/2)+64/315*I*a^3*sec(d*x+c)^5/d
/(a+I*a*tan(d*x+c))^(5/2)+16/63*I*a^2*sec(d*x+c)^5/d/(a+I*a*tan(d*x+c))^(3/
2)
```

Rubi [A] time = 0.18, antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3494, 3493}

$$\frac{16ia^2\sec^5(c+dx)}{63d(a+ia\tan(c+dx))^{3/2}}+\frac{64ia^3\sec^5(c+dx)}{315d(a+ia\tan(c+dx))^{5/2}}+\frac{2ia\sec^5(c+dx)}{9d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^5*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((64*I)/315)*a^3*Sec[c + d*x]^5)/(d*(a + I*a*Tan[c + d*x])^(5/2)) + (((16*
I)/63)*a^2*Sec[c + d*x]^5)/(d*(a + I*a*Tan[c + d*x])^(3/2)) + (((2*I)/9)*a*
Sec[c + d*x]^5)/(d*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int \sec^5(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx &= \frac{2ia\sec^5(c+dx)}{9d\sqrt{a+ia\tan(c+dx)}}+\frac{1}{9}(8a)\int \frac{\sec^5(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx\\ &= \frac{16ia^2\sec^5(c+dx)}{63d(a+ia\tan(c+dx))^{3/2}}+\frac{2ia\sec^5(c+dx)}{9d\sqrt{a+ia\tan(c+dx)}}+\frac{1}{63}\left(32a^2\right)\int \frac{}{(a-}\\ &= \frac{64ia^3\sec^5(c+dx)}{315d(a+ia\tan(c+dx))^{5/2}}+\frac{16ia^2\sec^5(c+dx)}{63d(a+ia\tan(c+dx))^{3/2}}+\frac{2ia\sec^5(}{9d\sqrt{a+ia\,\text{ta}}}\end{aligned}$$

Mathematica [A] time = 0.45, size = 77, normalized size = 0.70

$$\frac{2\sec^4(c+dx)\sqrt{a+ia\tan(c+dx)}\,(55i\sin(2(c+dx))+71\cos(2(c+dx))+36)(\sin(3(c+dx))+i\cos(3(c+dx)))}{315d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^5*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (2*Sec[c + d*x]^4*(36 + 71*Cos[2*(c + d*x)] + (55*I)*Sin[2*(c + d*x)])*(I*C
os[3*(c + d*x)] + Sin[3*(c + d*x)])*Sqrt[a + I*a*Tan[c + d*x]])/(315*d)
```

fricas [A] time = 1.46, size = 97, normalized size = 0.88

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(2016i\,e^{(4i\,dx+4i\,c)}+1152i\,e^{(2i\,dx+2i\,c)}+256i\right)}{315\left(de^{(8i\,dx+8i\,c)}+4\,de^{(6i\,dx+6i\,c)}+6\,de^{(4i\,dx+4i\,c)}+4\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/315*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(2016*I*e^(4*I*d*x + 4*I*c)
 + 1152*I*e^(2*I*d*x + 2*I*c) + 256*I)/(d*e^(8*I*d*x + 8*I*c) + 4*d*e^(6*I*
d*x + 6*I*c) + 6*d*e^(4*I*d*x + 4*I*c) + 4*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{i\,a\tan\left(dx+c\right)+a}\,\sec\left(dx+c\right)^{5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)*sec(d*x + c)^5, x)
```

maple [A] time = 1.28, size = 114, normalized size = 1.04

$$\frac{2\left(128i\left(\cos^{5}\left(dx+c\right)\right)+128\sin\left(dx+c\right)\left(\cos^{4}\left(dx+c\right)\right)-16i\left(\cos^{3}\left(dx+c\right)\right)+48\left(\cos^{2}\left(dx+c\right)\right)\sin\left(dx+c\right)\right.}{315d\cos\left(dx+c\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^5*(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 2/315/d*(128*I*cos(d*x+c)^5+128*sin(d*x+c)*cos(d*x+c)^4-16*I*cos(d*x+c)^3+4
8*cos(d*x+c)^2*sin(d*x+c)-5*I*cos(d*x+c)+35*sin(d*x+c))*(a*(I*sin(d*x+c)+co
s(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^4
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [B] time = 6.08, size = 102, normalized size = 0.93

$$\frac{32\,\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\,\sqrt{a-\frac{a\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)\,1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,36\mathrm{i}+\mathrm{e}^{c\,4\mathrm{i}+d\,x\,4\mathrm{i}}\,63\mathrm{i}+8\mathrm{i}\right)}{315\,d\,{\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(1/2)/cos(c + d*x)^5,x)
```

```
[Out] (32*exp(- c*1i - d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i
 + d*x*2i) + 1))^(1/2)*(exp(c*2i + d*x*2i)*36i + exp(c*4i + d*x*4i)*63i + 8
i))/(315*d*(exp(c*2i + d*x*2i) + 1)^4)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{ia\left(\tan\left(c+dx\right)-i\right)}\,\sec^5\left(c+dx\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**5*(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(I*a*(tan(c + d*x) - I))*sec(c + d*x)**5, x)
```

3.288 $\int \sec^3(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=73

$$\frac{8ia^2\sec^3(c+dx)}{15d(a+ia\tan(c+dx))^{3/2}}+\frac{2ia\sec^3(c+dx)}{5d\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] 2/5*I*a*sec(d*x+c)^3/d/(a+I*a*tan(d*x+c))^(1/2)+8/15*I*a^2*sec(d*x+c)^3/d/(
a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.11, antiderivative size = 73, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3494, 3493}

$$\frac{8ia^2\sec^3(c+dx)}{15d(a+ia\tan(c+dx))^{3/2}}+\frac{2ia\sec^3(c+dx)}{5d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((8*I)/15)*a^2*Sec[c + d*x]^3)/(d*(a + I*a*Tan[c + d*x])^(3/2)) + (((2*I)/
5)*a*Sec[c + d*x]^3)/(d*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int \sec^3(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx &= \frac{2ia\sec^3(c+dx)}{5d\sqrt{a+ia\tan(c+dx)}}+\frac{1}{5}(4a)\int \frac{\sec^3(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx\\ &= \frac{8ia^2\sec^3(c+dx)}{15d(a+ia\tan(c+dx))^{3/2}}+\frac{2ia\sec^3(c+dx)}{5d\sqrt{a+ia\tan(c+dx)}}\end{aligned}$$

Mathematica [A] time = 0.28, size = 63, normalized size = 0.86

$$-\frac{2(3\tan(c+dx)-7i)\sec(c+dx)\sqrt{a+ia\tan(c+dx)}\,(\cos(2(c+dx))-i\sin(2(c+dx)))}{15d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^3*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (-2*Sec[c + d*x]*(Cos[2*(c + d*x)] - I*Sin[2*(c + d*x)])*(-7*I + 3*Tan[c +
d*x])*Sqrt[a + I*a*Tan[c + d*x]])/(15*d)
```

fricas [A] time = 0.51, size = 62, normalized size = 0.85

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(40i\,e^{(2i\,dx+2i\,c)}+16i\right)}{15\left(de^{(4i\,dx+4i\,c)}+2\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/15*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(40*I*e^(2*I*d*x + 2*I*c) +
16*I)/(d*e^(4*I*d*x + 4*I*c) + 2*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{i\,a\tan\left(dx+c\right)+a}\,\sec\left(dx+c\right)^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)*sec(d*x + c)^3, x)
```

maple [A] time = 1.19, size = 87, normalized size = 1.19

$$\frac{2\left(8i\left(\cos^{3}\left(dx+c\right)\right)+8\left(\cos^{2}\left(dx+c\right)\right)\sin\left(dx+c\right)-i\cos\left(dx+c\right)+3\sin\left(dx+c\right)\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}}{15d\cos\left(dx+c\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 2/15/d*(8*I*cos(d*x+c)^3+8*cos(d*x+c)^2*sin(d*x+c)-I*cos(d*x+c)+3*sin(d*x+c
))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^2
```

maxima [B] time = 33.00, size = 225, normalized size = 3.08

$$-\frac{}{\left(\cos\left(2\,dx+2\,c\right)^{2}+\sin\left(2\,dx+2\,c\right)^{2}+2\,\cos\left(2\,dx+2\,c\right)+1\right)^{\frac{1}{4}}\left(\left(225\,\cos\left(4\,dx+4\,c\right)+450\,\cos\left(2\,dx+2\,c\right)+22\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -(-600*I*sqrt(2)*cos(2*d*x + 2*c) + 600*sqrt(2)*sin(2*d*x + 2*c) - 240*I*sq
rt(2))*sqrt(a)/((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*
c) + 1)^(1/4)*((225*cos(4*d*x + 4*c) + 450*cos(2*d*x + 2*c) + 225*I*sin(4*d
*x + 4*c) + 450*I*sin(2*d*x + 2*c) + 225)*cos(1/2*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c) + 1)) - (-225*I*cos(4*d*x + 4*c) - 450*I*cos(2*d*x + 2*c)
 + 225*sin(4*d*x + 4*c) + 450*sin(2*d*x + 2*c) - 225*I)*sin(1/2*arctan2(sin
(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)))*d)
```

mupad [B] time = 5.95, size = 88, normalized size = 1.21

$$\frac{8\,\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,5\mathrm{i}+2\mathrm{i}\right)\,\sqrt{a-\frac{a\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)\,1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}}{15\,d\,{\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(1/2)/cos(c + d*x)^3,x)
```

```
[Out] (8*exp(- c*1i - d*x*1i)*(exp(c*2i + d*x*2i)*5i + 2i)*(a - (a*(exp(c*2i + d*
x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2))/(15*d*(exp(c*2i + d*x*2
i) + 1)^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{ia\left(\tan\left(c+dx\right)-i\right)}\,\sec^{3}\left(c+dx\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3*(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(I*a*(tan(c + d*x) - I))*sec(c + d*x)**3, x)
```

3.289 $\int \sec(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=31

$$\frac{2ia\sec(c+dx)}{d\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] 2*I*a*sec(d*x+c)/d/(a+I*a*tan(d*x+c))^(1/2)
```

Rubi [A] time = 0.03, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.042, Rules used = {3493}

$$\frac{2ia\sec(c+dx)}{d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((2*I)*a*Sec[c + d*x])/(d*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rubi steps

$$\int \sec(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx = \frac{2ia\sec(c+dx)}{d\sqrt{a+ia\tan(c+dx)}}$$

Mathematica [A] time = 0.18, size = 39, normalized size = 1.26

$$\frac{2\sqrt{a+ia\tan(c+dx)}\,(\sin(c+dx)+i\cos(c+dx))}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (2*(I*Cos[c + d*x] + Sin[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])/d
```

fricas [A] time = 0.53, size = 25, normalized size = 0.81

$$\frac{2i\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 2*I*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{i\,a\tan(dx+c)+a}\,\sec(dx+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)*sec(d*x + c), x)
```

maple [A] time = 0.88, size = 50, normalized size = 1.61

$$\frac{2\left(i\cos\left(dx+c\right)+\sin\left(dx+c\right)\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)*(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 2/d*(I*cos(d*x+c)+sin(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2
)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{i\,a\tan\left(dx+c\right)+a}\,\sec\left(dx+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)*sec(d*x + c), x)
```

mupad [B] time = 0.35, size = 61, normalized size = 1.97

$$\frac{2\,\left(\sin\left(c+d\,x\right)+\cos\left(c+d\,x\right)\,1{}\mathrm{i}\right)\,\sqrt{\frac{a\,\left(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1{}\mathrm{i}\right)}{\cos(2\,c+2\,d\,x)+1}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(1/2)/cos(c + d*x),x)
```

```
[Out] (2*(cos(c + d*x)*1i + sin(c + d*x))*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x
)*1i + 1))/(cos(2*c + 2*d*x) + 1))^(1/2))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{ia\left(\tan\left(c+dx\right)-i\right)}\sec\left(c+dx\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(I*a*(tan(c + d*x) - I))*sec(c + d*x), x)
```

3.290 $\int \cos(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=83

$$\frac{i\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{\sqrt{2}d}-\frac{i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{d}$$

```
[Out] 1/2*I*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2))*a^(1
/2)/d*2^(1/2)-I*cos(d*x+c)*(a+I*a*tan(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.09, antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3490, 3489, 206}

$$\frac{i\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{\sqrt{2}d}-\frac{i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (I*Sqrt[a]*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[c + d*x
]])])/(Sqrt[2]*d) - (I*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])/d
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3490

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] + Dist[a/(2*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b*Tan[e +
f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] &&
EqQ[m/2 + n, 0] && GtQ[n, 0]
```

Rubi steps

$$\begin{aligned}\int \cos(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx &= -\frac{i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{d}+\frac{1}{2}a\int\frac{\sec(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx\\ &= -\frac{i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{d}+\frac{(ia)\,\text{Subst}\left(\int\frac{1}{2-ax^2}\,dx,x,\frac{\sec(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\right)}{d}\\ &= \frac{i\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{\sqrt{2}d}-\frac{i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{d}\end{aligned}$$

Mathematica [A] time = 0.57, size = 87, normalized size = 1.05

$$-\frac{ie^{-i(c+dx)}\left(e^{2i(c+dx)}-\sqrt{1+e^{2i(c+dx)}}\tanh^{-1}\left(\sqrt{1+e^{2i(c+dx)}}\right)+1\right)\sqrt{a+ia\tan(c+dx)}}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((-1/2*I)*(1 + E^((2*I)*(c + d*x)) - Sqrt[1 + E^((2*I)*(c + d*x))]*ArcTanh[
Sqrt[1 + E^((2*I)*(c + d*x))]])*Sqrt[a + I*a*Tan[c + d*x]])/(d*E^(I*(c + d*
x)))
```

fricas [B] time = 0.74, size = 183, normalized size = 2.20

$$\frac{\sqrt{2}\,d\sqrt{-\frac{a}{d^2}}\,\log\left(\frac{2\left(\left(de^{(2i\,dx+2i\,c)}+d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{-\frac{a}{d^2}}+i\,a\right)e^{(-i\,dx-i\,c)}}{d}\right)-\sqrt{2}\,d\sqrt{-\frac{a}{d^2}}\,\log\left(-\frac{2\left(\left(de^{(2i\,dx+2i\,c)}+d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{-}}{d}\right.}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/4*(sqrt(2)*d*sqrt(-a/d^2)*log(2*((d*e^(2*I*d*x + 2*I*c) + d)*sqrt(a/(e^(2
*I*d*x + 2*I*c) + 1))*sqrt(-a/d^2) + I*a)*e^(-I*d*x - I*c)/d) - sqrt(2)*d*s
qrt(-a/d^2)*log(-2*((d*e^(2*I*d*x + 2*I*c) + d)*sqrt(a/(e^(2*I*d*x + 2*I*c)
 + 1))*sqrt(-a/d^2) - I*a)*e^(-I*d*x - I*c)/d) + sqrt(2)*sqrt(a/(e^(2*I*d*x
 + 2*I*c) + 1))*(-2*I*e^(2*I*d*x + 2*I*c) - 2*I))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{i\,a\tan\left(dx+c\right)+a}\,\cos\left(dx+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)*cos(d*x + c), x)
```

maple [B] time = 1.12, size = 217, normalized size = 2.61

$$-\frac{\left(i\sqrt{2}\,\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\,\operatorname{arctanh}\left(\frac{\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\,\sin(dx+c)\sqrt{2}}{2\cos(dx+c)}\right)\sin\left(dx+c\right)-\sqrt{2}\,\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\,\arctan\left(\frac{\sqrt{-\frac{2\cos(dx+c}{1+\cos(dx+c}}}{2}\right.\right.}{2d\left(i\sin\left(dx+c\right)+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)*(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] -1/2/d*(I*2^(1/2)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctanh(1/2*(-2*cos(
d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*sin(d*x+c)-2^(1
/2)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d
*x+c)))^(1/2)*2^(1/2))*sin(d*x+c)+2*I*cos(d*x+c)^2-2*I*cos(d*x+c)-2*cos(d*x
+c)*sin(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/(I*sin(d*x+c
)+cos(d*x+c)-1)
```

maxima [B] time = 1.07, size = 774, normalized size = 9.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/8*((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/
4)*(-4*I*sqrt(2)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) +
 4*sqrt(2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)))*sqrt(a
) - (2*sqrt(2)*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d
*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1
)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4
)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1) - 2*sqrt(2)
*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)
^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (cos(2*d*x
 + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arct
an2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 1) - I*sqrt(2)*log(sqrt(cos(
2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*cos(1/2*arcta
n2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + sqrt(cos(2*d*x + 2*c)^2 + s
in(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*sin(1/2*arctan2(sin(2*d*x + 2*c
), cos(2*d*x + 2*c) + 1))^2 + 2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 +
2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
 2*c) + 1)) + 1) + I*sqrt(2)*log(sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)
^2 + 2*cos(2*d*x + 2*c) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
2*c) + 1))^2 + sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x +
 2*c) + 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 - 2*(
cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos
(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1))*sqrt(a))/d
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \cos(c+d\,x)\,\sqrt{a+a\tan(c+d\,x)\,1\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] int(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{ia\left(\tan(c+dx)-i\right)}\,\cos(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(I*a*(tan(c + d*x) - I))*cos(c + d*x), x)
```

3.291 $\int \cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=154

$$-\frac{i\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{3d}-\frac{5i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{8d}+\frac{5ia\cos(c+dx)}{12d\sqrt{a+ia\tan(c+dx)}}+\frac{5i\sqrt{a}\tanh}{}$$

```
[Out] 5/16*I*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2))*a^(
1/2)/d*2^(1/2)+5/12*I*a*cos(d*x+c)/d/(a+I*a*tan(d*x+c))^(1/2)-5/8*I*cos(d*x
+c)*(a+I*a*tan(d*x+c))^(1/2)/d-1/3*I*cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(1/2)/
d
```

Rubi [A] time = 0.22, antiderivative size = 154, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {3497, 3502, 3490, 3489, 206}

$$-\frac{i\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{3d}-\frac{5i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{8d}+\frac{5ia\cos(c+dx)}{12d\sqrt{a+ia\tan(c+dx)}}+\frac{5i\sqrt{a}\tanh}{}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((5*I)/8)*Sqrt[a]*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan
[c + d*x]])])/(Sqrt[2]*d) + (((5*I)/12)*a*Cos[c + d*x])/(d*Sqrt[a + I*a*Tan
[c + d*x]]) - (((5*I)/8)*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])/d - ((I/3
)*Cos[c + d*x]^3*Sqrt[a + I*a*Tan[c + d*x]])/d
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3490

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] + Dist[a/(2*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b*Tan[e +
f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] &&
EqQ[m/2 + n, 0] && GtQ[n, 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx = -\frac{i\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{3d}+\frac{1}{6}(5a)\int \frac{\cos(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx$$

$$= \frac{5ia\cos(c+dx)}{12d\sqrt{a+ia\tan(c+dx)}}-\frac{i\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{3d}+\frac{5}{8}\int \mathrm{co}$$

$$= \frac{5ia\cos(c+dx)}{12d\sqrt{a+ia\tan(c+dx)}}-\frac{5i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{8d}-\frac{i\cos^3(c}{}$$

$$= \frac{5ia\cos(c+dx)}{12d\sqrt{a+ia\tan(c+dx)}}-\frac{5i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{8d}-\frac{i\cos^3(c}{}$$

$$= \frac{5i\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{8\sqrt{2}d}+\frac{5ia\cos(c+dx)}{12d\sqrt{a+ia\tan(c+dx)}}-\frac{5i\cos(c+}{}$$

Mathematica [A] time = 0.54, size = 126, normalized size = 0.82

$$-\frac{ie^{-3i(c+dx)}\left(11e^{2i(c+dx)}+16e^{4i(c+dx)}+2e^{6i(c+dx)}-15e^{2i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\tanh^{-1}\left(\sqrt{1+e^{2i(c+dx)}}\right)-3\right)\sqrt{a+ia\tan}}{48d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((-1/48*I)*(-3 + 11*E^((2*I)*(c + d*x)) + 16*E^((4*I)*(c + d*x)) + 2*E^((6*
I)*(c + d*x)) - 15*E^((2*I)*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))]*ArcTan
h[Sqrt[1 + E^((2*I)*(c + d*x))]])*Sqrt[a + I*a*Tan[c + d*x]])/(d*E^((3*I)*(
c + d*x)))
```

fricas [B] time = 0.58, size = 245, normalized size = 1.59

$$\left(15\sqrt{\frac{1}{2}}d\sqrt{-\frac{a}{d^2}}e^{(2idx+2ic)}\log\left(\frac{5\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(de^{(2idx+2ic)}+d\right)\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\sqrt{-\frac{a}{d^2}}+ia\right)e^{(-idx-ic)}}{4d}\right)-15\sqrt{\frac{1}{2}}d\sqrt{-\frac{a}{d^2}}e^{(2idx+2ic)}\log\left(-\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/48*(15*sqrt(1/2)*d*sqrt(-a/d^2)*e^(2*I*d*x + 2*I*c)*log(5/4*(sqrt(2)*sqrt
(1/2)*(d*e^(2*I*d*x + 2*I*c) + d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(-a
/d^2) + I*a)*e^(-I*d*x - I*c)/d) - 15*sqrt(1/2)*d*sqrt(-a/d^2)*e^(2*I*d*x +
 2*I*c)*log(-5/4*(sqrt(2)*sqrt(1/2)*(d*e^(2*I*d*x + 2*I*c) + d)*sqrt(a/(e^(
2*I*d*x + 2*I*c) + 1))*sqrt(-a/d^2) - I*a)*e^(-I*d*x - I*c)/d) + sqrt(2)*sq
rt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-2*I*e^(6*I*d*x + 6*I*c) - 16*I*e^(4*I*d*x
 + 4*I*c) - 11*I*e^(2*I*d*x + 2*I*c) + 3*I))*e^(-2*I*d*x - 2*I*c)/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{i\,a\tan\left(dx+c\right)+a}\,\cos\left(dx+c\right)^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)*cos(d*x + c)^3, x)
```

maple [B] time = 1.34, size = 569, normalized size = 3.69

$$-\frac{\left(15i\left(\cos^{2}\left(dx+c\right)\right)\sin\left(dx+c\right)\left(-\frac{2\cos(dx+c)}{1+\cos(dx+c)}\right)^{\frac{5}{2}}\operatorname{arctanh}\left(\frac{\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\,\sin(dx+c)\sqrt{2}}{2\cos(dx+c)}\right)\sqrt{2}+30i\cos\left(dx+c\right)\sin\left(\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] -1/192/d*(15*I*cos(d*x+c)^2*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(5/2)
*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(
1/2))*2^(1/2)+30*I*cos(d*x+c)*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(5/
2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2
^(1/2))*2^(1/2)-15*cos(d*x+c)^2*sin(d*x+c)*arctan(1/2*(-2*cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(5/2)*2^(1/2)+15*I*
2^(1/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x
+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(5/2)*sin(d*x+c)-30*cos(d*x+c)*
sin(d*x+c)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos
(d*x+c)/(1+cos(d*x+c)))^(5/2)*2^(1/2)-15*2^(1/2)*arctan(1/2*(-2*cos(d*x+c)/
(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(5/2)*sin(d*x
+c)+64*I*cos(d*x+c)^6+16*I*cos(d*x+c)^5-64*cos(d*x+c)^5*sin(d*x+c)+40*I*cos
(d*x+c)^4+80*sin(d*x+c)*cos(d*x+c)^4-120*I*cos(d*x+c)^3-120*cos(d*x+c)^3*si
n(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/(I*sin(d*x+c)+cos(
d*x+c)-1)/cos(d*x+c)^2
```

maxima [B] time = 0.82, size = 934, normalized size = 6.06

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/192*((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(
3/4)*(-8*I*sqrt(2)*cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))
 + 8*sqrt(2)*sin(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)))*sqrt
(a) + (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1
/4)*((12*I*sqrt(2)*cos(2*d*x + 2*c) + 12*sqrt(2)*sin(2*d*x + 2*c) - 48*I*sq
rt(2))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 12*(sqrt(
2)*cos(2*d*x + 2*c) - I*sqrt(2)*sin(2*d*x + 2*c) - 4*sqrt(2))*sin(1/2*arcta
n2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)))*sqrt(a) - (30*sqrt(2)*arctan2(
(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*si
n(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2
 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1) - 30*sqrt(2)*arctan2((cos(2*d*x +
2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2
(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x
+ 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c),
```

```
cos(2*d*x + 2*c) + 1)) - 1) - 15*I*sqrt(2)*log(sqrt(cos(2*d*x + 2*c)^2 + si
n(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c)
, cos(2*d*x + 2*c) + 1))^2 + sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 +
 2*cos(2*d*x + 2*c) + 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
 + 1))^2 + 2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c)
+ 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1) +
15*I*sqrt(2)*log(sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x
 + 2*c) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + s
qrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*sin(1
/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 - 2*(cos(2*d*x + 2*c)
^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin
(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1))*sqrt(a))/d
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \cos(c+d\,x)^3\,\sqrt{a+a\tan(c+d\,x)\,1\mathrm{i}}\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] int(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3*(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

3.292 $\int \cos^5(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=223

$$-\frac{i\cos^5(c+dx)\sqrt{a+ia\tan(c+dx)}}{5d}-\frac{21i\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{80d}+\frac{9ia\cos^3(c+dx)}{40d\sqrt{a+ia\tan(c+dx)}}-\frac{63i\cos(c}{}$$

```
[Out] 63/256*I*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2))*a
^(1/2)/d*2^(1/2)+21/64*I*a*cos(d*x+c)/d/(a+I*a*tan(d*x+c))^(1/2)+9/40*I*a*c
os(d*x+c)^3/d/(a+I*a*tan(d*x+c))^(1/2)-63/128*I*cos(d*x+c)*(a+I*a*tan(d*x+c
))^(1/2)/d-21/80*I*cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(1/2)/d-1/5*I*cos(d*x+c)
^5*(a+I*a*tan(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.39, antiderivative size = 223, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {3497, 3502, 3490, 3489, 206}

$$-\frac{i\cos^5(c+dx)\sqrt{a+ia\tan(c+dx)}}{5d}-\frac{21i\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{80d}+\frac{9ia\cos^3(c+dx)}{40d\sqrt{a+ia\tan(c+dx)}}-\frac{63i\cos(c}{}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^5*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((63*I)/128)*Sqrt[a]*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*
Tan[c + d*x]])])/(Sqrt[2]*d) + (((21*I)/64)*a*Cos[c + d*x])/(d*Sqrt[a + I*a
*Tan[c + d*x]]) + (((9*I)/40)*a*Cos[c + d*x]^3)/(d*Sqrt[a + I*a*Tan[c + d*x
]]) - (((63*I)/128)*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])/d - (((21*I)/8
0)*Cos[c + d*x]^3*Sqrt[a + I*a*Tan[c + d*x]])/d - ((I/5)*Cos[c + d*x]^5*Sqr
t[a + I*a*Tan[c + d*x]])/d
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3490

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] + Dist[a/(2*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b*Tan[e +
f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] &&
EqQ[m/2 + n, 0] && GtQ[n, 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \cos^5(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx = -\frac{i\cos^5(c+dx)\sqrt{a+ia\tan(c+dx)}}{5d}+\frac{1}{10}(9a)\int \frac{\cos^3(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx$$

$$= \frac{9ia\cos^3(c+dx)}{40d\sqrt{a+ia\tan(c+dx)}}-\frac{i\cos^5(c+dx)\sqrt{a+ia\tan(c+dx)}}{5d}+\frac{63}{80}\int c$$

$$= \frac{9ia\cos^3(c+dx)}{40d\sqrt{a+ia\tan(c+dx)}}-\frac{21i\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{80d}-\frac{i\cos^5}{}$$

$$= \frac{21ia\cos(c+dx)}{64d\sqrt{a+ia\tan(c+dx)}}+\frac{9ia\cos^3(c+dx)}{40d\sqrt{a+ia\tan(c+dx)}}-\frac{21i\cos^3(c+dx)\sqrt{}}{8}$$

$$= \frac{21ia\cos(c+dx)}{64d\sqrt{a+ia\tan(c+dx)}}+\frac{9ia\cos^3(c+dx)}{40d\sqrt{a+ia\tan(c+dx)}}-\frac{63i\cos(c+dx)\sqrt{}}{12}$$

$$= \frac{21ia\cos(c+dx)}{64d\sqrt{a+ia\tan(c+dx)}}+\frac{9ia\cos^3(c+dx)}{40d\sqrt{a+ia\tan(c+dx)}}-\frac{63i\cos(c+dx)\sqrt{}}{12}$$

$$= \frac{63i\sqrt{a}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{128\sqrt{2}d}+\frac{21ia\cos(c+dx)}{64d\sqrt{a+ia\tan(c+dx)}}+\frac{9ia}{40d\sqrt{a}}$$

Mathematica [A] time = 0.64, size = 152, normalized size = 0.68

$$-\frac{ie^{-5i(c+dx)}\left(-95e^{2i(c+dx)}+203e^{4i(c+dx)}+344e^{6i(c+dx)}+64e^{8i(c+dx)}+8e^{10i(c+dx)}-315e^{4i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\tanh^{-1}\left(\right.\right.}{1280d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^5*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((-1/1280*I)*(-10 - 95*E^((2*I)*(c + d*x)) + 203*E^((4*I)*(c + d*x)) + 344*
E^((6*I)*(c + d*x)) + 64*E^((8*I)*(c + d*x)) + 8*E^((10*I)*(c + d*x)) - 315
*E^((4*I)*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))]*ArcTanh[Sqrt[1 + E^((2*I
)*(c + d*x))]])*Sqrt[a + I*a*Tan[c + d*x]])/(d*E^((5*I)*(c + d*x)))
```

fricas [A] time = 0.51, size = 267, normalized size = 1.20

$$\frac{\left(315\sqrt{\frac{1}{2}}d\sqrt{-\frac{a}{d^2}}e^{(4i\,dx+4i\,c)}\log\left(\frac{63\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(de^{(2i\,dx+2i\,c)}+d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{-\frac{a}{d^2}}+i\,a\right)e^{(-i\,dx-i\,c)}}{64\,d}\right)-315\sqrt{\frac{1}{2}}d\sqrt{-\frac{a}{d^2}}e^{(4i\,dx+4i\,c)}\log\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/1280*(315*sqrt(1/2)*d*sqrt(-a/d^2)*e^(4*I*d*x + 4*I*c)*log(63/64*(sqrt(2)
*sqrt(1/2)*(d*e^(2*I*d*x + 2*I*c) + d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sq
```

```
rt(-a/d^2) + I*a)*e^(-I*d*x - I*c)/d) - 315*sqrt(1/2)*d*sqrt(-a/d^2)*e^(4*I
*d*x + 4*I*c)*log(-63/64*(sqrt(2)*sqrt(1/2)*(d*e^(2*I*d*x + 2*I*c) + d)*sqr
t(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(-a/d^2) - I*a)*e^(-I*d*x - I*c)/d) + sq
rt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-8*I*e^(10*I*d*x + 10*I*c) - 64*I*
e^(8*I*d*x + 8*I*c) - 344*I*e^(6*I*d*x + 6*I*c) - 203*I*e^(4*I*d*x + 4*I*c)
 + 95*I*e^(2*I*d*x + 2*I*c) + 10*I))*e^(-4*I*d*x - 4*I*c)/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{i\,a \tan(dx+c) + a}\,\cos(dx+c)^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)*cos(d*x + c)^5, x)
```

maple [B] time = 1.32, size = 913, normalized size = 4.09

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] -1/20480/d*(1344*I*cos(d*x+c)^7-315*cos(d*x+c)^4*sin(d*x+c)*(-2*cos(d*x+c)/
(1+cos(d*x+c)))^(9/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/
2))*2^(1/2)+512*I*cos(d*x+c)^9-1260*cos(d*x+c)^3*sin(d*x+c)*(-2*cos(d*x+c)/
(1+cos(d*x+c)))^(9/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/
2))*2^(1/2)+3360*I*cos(d*x+c)^6-1890*cos(d*x+c)^2*sin(d*x+c)*(-2*cos(d*x+c)
/(1+cos(d*x+c)))^(9/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1
/2))*2^(1/2)-10080*I*cos(d*x+c)^5-1260*cos(d*x+c)*sin(d*x+c)*(-2*cos(d*x+c)
/(1+cos(d*x+c)))^(9/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1
/2))*2^(1/2)+1890*I*cos(d*x+c)^2*sin(d*x+c)*arctanh(1/2*(-2*cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+
c)))^(9/2)*2^(1/2)-315*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1
/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(9/2)*2^(1/2)*sin(d*x+c)+768*I*cos(d*x+
c)^8+315*I*cos(d*x+c)^4*sin(d*x+c)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)
))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(9/2
)*2^(1/2)-4096*sin(d*x+c)*cos(d*x+c)^9+1260*I*cos(d*x+c)^3*sin(d*x+c)*arcta
nh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*
(-2*cos(d*x+c)/(1+cos(d*x+c)))^(9/2)*2^(1/2)+4608*sin(d*x+c)*cos(d*x+c)^8+1
260*I*cos(d*x+c)*sin(d*x+c)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2
)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(9/2)*2^(1/
2)-5376*sin(d*x+c)*cos(d*x+c)^7+4096*I*cos(d*x+c)^10+6720*sin(d*x+c)*cos(d*
x+c)^6+315*I*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/co
s(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(9/2)*2^(1/2)*sin(d*x+c)-1
0080*cos(d*x+c)^5*sin(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2
)/(I*sin(d*x+c)+cos(d*x+c)-1)/cos(d*x+c)^4
```

maxima [B] time = 2.00, size = 2215, normalized size = 9.93

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -1/5120*((cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*
arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*
x + 4*c), cos(4*d*x + 4*c))) + 1)^(3/4)*((60*I*sqrt(2)*cos(4*d*x + 4*c) + 6
0*sqrt(2)*sin(4*d*x + 4*c) + 160*I*sqrt(2))*cos(3/2*arctan2(sin(1/2*arctan2
```

(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), co
s(4*d*x + 4*c))) + 1)) - 20*(3*sqrt(2)*cos(4*d*x + 4*c) - 3*I*sqrt(2)*sin(4
*d*x + 4*c) + 8*sqrt(2))*sin(3/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c),
cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) +
1)))*sqrt(a) + (cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + si
n(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(si
n(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*((32*I*sqrt(2)*cos(1/2*arctan
2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 32*I*sqrt(2)*sin(1/2*arctan2(sin
(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 64*I*sqrt(2)*cos(1/2*arctan2(sin(4*d*
x + 4*c), cos(4*d*x + 4*c))) + 32*I*sqrt(2))*cos(5/2*arctan2(sin(1/2*arctan
2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), c
os(4*d*x + 4*c))) + 1)) + (-100*I*sqrt(2)*cos(4*d*x + 4*c) - 400*I*sqrt(2)*
cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 100*sqrt(2)*sin(4*d*
x + 4*c) - 400*sqrt(2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))
 + 960*I*sqrt(2))*cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d
*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)) - 3
2*(sqrt(2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sqrt(2)
*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*sqrt(2)*cos(1/2
*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + sqrt(2))*sin(5/2*arctan2(si
n(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d
*x + 4*c), cos(4*d*x + 4*c))) + 1)) + (100*sqrt(2)*cos(4*d*x + 4*c) + 400*s
qrt(2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 100*I*sqrt(2)
*sin(4*d*x + 4*c) - 400*I*sqrt(2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d
*x + 4*c))) - 960*sqrt(2))*sin(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c)
, cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))
+ 1)))*sqrt(a) + (630*sqrt(2)*arctan2((cos(1/2*arctan2(sin(4*d*x + 4*c), co
s(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2
 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*sin(1/
2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arc
tan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)), (cos(1/2*arctan2(sin(4*d*x
 + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x
 + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(
1/4)*cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))),
cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)) + 1) - 630*sqrt(
2)*arctan2((cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/
2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*
d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*sin(1/2*arctan2(sin(1/2*arctan2(s
in(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(
4*d*x + 4*c))) + 1)), (cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))
^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arc
tan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(1/
2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x +
 4*c), cos(4*d*x + 4*c))) + 1)) - 1) - 315*I*sqrt(2)*log(sqrt(cos(1/2*arcta
n2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c
), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4
*c))) + 1)*cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*
c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1))^2 + sqrt(c
os(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin
(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), c
os(4*d*x + 4*c))) + 1)*sin(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), co
s(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)
)^2 + 2*(cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*a
rctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x
 + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(1/2*arctan2(sin(
4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d
*x + 4*c))) + 1)) + 1) + 315*I*sqrt(2)*log(sqrt(cos(1/2*arctan2(sin(4*d*x +
 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x +
 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)*cos
(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*

```
arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1))^2 + sqrt(cos(1/2*arctan2
(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c),
 cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c
))) + 1)*sin(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)
)), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1))^2 - 2*(cos(1
/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d
*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4
*d*x + 4*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c),
cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) +
1)) + 1))*sqrt(a))/d
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \cos(c+dx)^5 \sqrt{a+a\tan(c+dx)\,1\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^(1/2),x)
[Out] int(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**5*(a+I*a*tan(d*x+c))**(1/2),x)
[Out] Timed out
```

3.293 $\int \sec^8(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx$

Optimal. Leaf size=117

$$\frac{2i(a+ia\tan(c+dx))^{17/2}}{17a^7d}-\frac{4i(a+ia\tan(c+dx))^{15/2}}{5a^6d}+\frac{24i(a+ia\tan(c+dx))^{13/2}}{13a^5d}-\frac{16i(a+ia\tan(c+dx))^{11/2}}{11a^4d}$$

```
[Out] -16/11*I*(a+I*a*tan(d*x+c))^(11/2)/a^4/d+24/13*I*(a+I*a*tan(d*x+c))^(13/2)/
a^5/d-4/5*I*(a+I*a*tan(d*x+c))^(15/2)/a^6/d+2/17*I*(a+I*a*tan(d*x+c))^(17/2
)/a^7/d
```

Rubi [A] time = 0.09, antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 43}

$$\frac{2i(a+ia\tan(c+dx))^{17/2}}{17a^7d}-\frac{4i(a+ia\tan(c+dx))^{15/2}}{5a^6d}+\frac{24i(a+ia\tan(c+dx))^{13/2}}{13a^5d}-\frac{16i(a+ia\tan(c+dx))^{11/2}}{11a^4d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^8*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((-16*I)/11)*(a + I*a*Tan[c + d*x])^(11/2))/(a^4*d) + (((24*I)/13)*(a + I*
a*Tan[c + d*x])^(13/2))/(a^5*d) - (((4*I)/5)*(a + I*a*Tan[c + d*x])^(15/2))
/(a^6*d) + (((2*I)/17)*(a + I*a*Tan[c + d*x])^(17/2))/(a^7*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^8(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^3(a+x)^{9/2}\,dx,x,ia\tan(c+dx)\right)}{a^7d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(8a^3(a+x)^{9/2}-12a^2(a+x)^{11/2}+6a(a+x)^{13/2}-(a+x)^{1\cdots}\right.\right.}{a^7d}\\ &= -\frac{16i(a+ia\tan(c+dx))^{11/2}}{11a^4d}+\frac{24i(a+ia\tan(c+dx))^{13/2}}{13a^5d}-\frac{4i(a+ia\,\text{t}\cdots}{}\end{aligned}$$

Mathematica [A] time = 1.19, size = 111, normalized size = 0.95

$$\frac{2a\sec^8(c+dx)(\cos(dx)-i\sin(dx))\sqrt{a+ia\tan(c+dx)}\,(-11i(34\sin(c+dx)+99\sin(3(c+dx)))+646\cos(c+d\cdots}{12155d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^8*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (2*a*Sec[c + d*x]^8*(Cos[d*x] - I*Sin[d*x])*(646*Cos[c + d*x] + 1121*Cos[3*
(c + d*x)] - (11*I)*(34*Sin[c + d*x] + 99*Sin[3*(c + d*x)]))*((-I)*Cos[5*c
+ 6*d*x] + Sin[5*c + 6*d*x])*Sqrt[a + I*a*Tan[c + d*x]])/(12155*d)
```

fricas [A] time = 0.53, size = 170, normalized size = 1.45

$$\frac{\sqrt{2}\left(-8192i\,ae^{(17i\,dx+17i\,c)} - 69632i\,ae^{(15i\,dx+15i\,c)} - 261120i\,ae^{(13i\,dx+13i\,c)} - 565760i\,ae^{(11i\,dx+11i}\right.}{12155\left(de^{(16i\,dx+16i\,c)} + 8\,de^{(14i\,dx+14i\,c)} + 28\,de^{(12i\,dx+12i\,c)} + 56\,de^{(10i\,dx+10i\,c)} + 70\,de^{(8i\,dx+8i\,c)} + 56\,de^{(6i\,dx+6i\,c)} + 2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/12155*sqrt(2)*(-8192*I*a*e^(17*I*d*x + 17*I*c) - 69632*I*a*e^(15*I*d*x +
15*I*c) - 261120*I*a*e^(13*I*d*x + 13*I*c) - 565760*I*a*e^(11*I*d*x + 11*I*
c))*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))/(d*e^(16*I*d*x + 16*I*c) + 8*d*e^(14*
I*d*x + 14*I*c) + 28*d*e^(12*I*d*x + 12*I*c) + 56*d*e^(10*I*d*x + 10*I*c) +
 70*d*e^(8*I*d*x + 8*I*c) + 56*d*e^(6*I*d*x + 6*I*c) + 28*d*e^(4*I*d*x + 4*
I*c) + 8*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(3/2)*sec(d*x + c)^8, x)
```

maple [A] time = 6.80, size = 152, normalized size = 1.30

$$-\frac{2\left(2048i\left(\cos^{8}(dx+c)\right) - 2048\sin(dx+c)\left(\cos^{7}(dx+c)\right) + 256i\left(\cos^{6}(dx+c)\right) - 1280\left(\cos^{5}(dx+c)\right)\sin\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] -2/12155/d*(2048*I*cos(d*x+c)^8-2048*sin(d*x+c)*cos(d*x+c)^7+256*I*cos(d*x+
c)^6-1280*cos(d*x+c)^5*sin(d*x+c)+112*I*cos(d*x+c)^4-1008*cos(d*x+c)^3*sin(
d*x+c)+66*I*cos(d*x+c)^2-858*cos(d*x+c)*sin(d*x+c)-715*I)*(a*(I*sin(d*x+c)+
cos(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^8*a
```

maxima [A] time = 0.43, size = 76, normalized size = 0.65

$$\frac{2i\left(715\,(i\,a\tan(dx+c)+a)^{\frac{17}{2}} - 4862\,(i\,a\tan(dx+c)+a)^{\frac{15}{2}}a + 11220\,(i\,a\tan(dx+c)+a)^{\frac{13}{2}}a^{2} - 8840\,(i\,a\tan\right.}{12155\,a^{7}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 2/12155*I*(715*(I*a*tan(d*x + c) + a)^(17/2) - 4862*(I*a*tan(d*x + c) + a)^
(15/2)*a + 11220*(I*a*tan(d*x + c) + a)^(13/2)*a^2 - 8840*(I*a*tan(d*x + c)
 + a)^(11/2)*a^3)/(a^7*d)
```

mupad [B] time = 16.02, size = 544, normalized size = 4.65

$$-\frac{a\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,8192i}{12155\,d}-\frac{a\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,4096i}{12155\,d\,\left(e^{c\,2i+d\,x\,2i}+1\right)}-\frac{a\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,3072i}{12155\,d\left(e^{c\,2i+d\,x\,2i}+1\right)^2}-\frac{a\sqrt{a-\frac{a\left(e^{c\,2i+d\,x}\right.}{e^{c\,2i+d}}}}{2431\,d\left(e^{c\,2i+}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(3/2)/cos(c + d*x)^8,x)
```

```
[Out] (a*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)
*155136i)/(2431*d*(exp(c*2i + d*x*2i) + 1)^4) - (a*(a - (a*(exp(c*2i + d*x*
2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*4096i)/(12155*d*(exp(c*2i
+ d*x*2i) + 1)) - (a*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d
*x*2i) + 1))^(1/2)*3072i)/(12155*d*(exp(c*2i + d*x*2i) + 1)^2) - (a*(a - (a
*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*512i)/(24
31*d*(exp(c*2i + d*x*2i) + 1)^3) - (a*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*
1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*8192i)/(12155*d) - (a*(a - (a*(exp(c*2i
 + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*2413568i)/(12155*d*
(exp(c*2i + d*x*2i) + 1)^5) + (a*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(
exp(c*2i + d*x*2i) + 1))^(1/2)*270336i)/(1105*d*(exp(c*2i + d*x*2i) + 1)^6)
 - (a*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1
/2)*11776i)/(85*d*(exp(c*2i + d*x*2i) + 1)^7) + (a*(a - (a*(exp(c*2i + d*x*
2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*512i)/(17*d*(exp(c*2i + d*
x*2i) + 1)^8)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8*(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

3.294 $\int \sec^6(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx$

Optimal. Leaf size=88

$$-\frac{2i(a+ia\tan(c+dx))^{13/2}}{13a^5d}+\frac{8i(a+ia\tan(c+dx))^{11/2}}{11a^4d}-\frac{8i(a+ia\tan(c+dx))^{9/2}}{9a^3d}$$

```
[Out] -8/9*I*(a+I*a*tan(d*x+c))^(9/2)/a^3/d+8/11*I*(a+I*a*tan(d*x+c))^(11/2)/a^4/
d-2/13*I*(a+I*a*tan(d*x+c))^(13/2)/a^5/d
```

Rubi [A] time = 0.08, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 43}

$$-\frac{2i(a+ia\tan(c+dx))^{13/2}}{13a^5d}+\frac{8i(a+ia\tan(c+dx))^{11/2}}{11a^4d}-\frac{8i(a+ia\tan(c+dx))^{9/2}}{9a^3d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((-8*I)/9)*(a + I*a*Tan[c + d*x])^(9/2))/(a^3*d) + (((8*I)/11)*(a + I*a*Ta
n[c + d*x])^(11/2))/(a^4*d) - (((2*I)/13)*(a + I*a*Tan[c + d*x])^(13/2))/(a
^5*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^6(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^2(a+x)^{7/2}\,dx,x,ia\tan(c+dx)\right)}{a^5d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(4a^2(a+x)^{7/2}-4a(a+x)^{9/2}+(a+x)^{11/2}\right)dx,x,ia\tan\right.}{a^5d}\\ &= -\frac{8i(a+ia\tan(c+dx))^{9/2}}{9a^3d}+\frac{8i(a+ia\tan(c+dx))^{11/2}}{11a^4d}-\frac{2i(a+ia\,t}{1}\end{aligned}$$

Mathematica [A] time = 0.61, size = 93, normalized size = 1.06

$$\frac{2a\sec^6(c+dx)(\cos(dx)-i\sin(dx))\sqrt{a+ia\tan(c+dx)}\,(-135i\sin(2(c+dx))+151\cos(2(c+dx))+52)(\sin(4}{1287d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6*(a + I*a*Tan[c + d*x])^(3/2),x]
```

[Out] (2*a*Sec[c + d*x]^6*(Cos[d*x] - I*Sin[d*x])*(52 + 151*Cos[2*(c + d*x)] - (1
35*I)*Sin[2*(c + d*x)])*((-I)*Cos[4*c + 5*d*x] + Sin[4*c + 5*d*x])*Sqrt[a +
 I*a*Tan[c + d*x]])/(1287*d)

fricas [B] time = 0.54, size = 134, normalized size = 1.52

$$\frac{\sqrt{2}\left(-1024 i\, a e^{(13 i\, dx+13 i\, c)}-6656 i\, a e^{(11 i\, dx+11 i\, c)}-18304 i\, a e^{(9 i\, dx+9 i\, c)}\right)\sqrt{\frac{a}{e^{(2 i\, dx+2 i\, c)}+1}}}{1287\left(d e^{(12 i\, dx+12 i\, c)}+6\, d e^{(10 i\, dx+10 i\, c)}+15\, d e^{(8 i\, dx+8 i\, c)}+20\, d e^{(6 i\, dx+6 i\, c)}+15\, d e^{(4 i\, dx+4 i\, c)}+6\, d e^{(2 i\, dx+2 i\, c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")

[Out] 1/1287*sqrt(2)*(-1024*I*a*e^(13*I*d*x + 13*I*c) - 6656*I*a*e^(11*I*d*x + 11
*I*c) - 18304*I*a*e^(9*I*d*x + 9*I*c))*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))/(d
*e^(12*I*d*x + 12*I*c) + 6*d*e^(10*I*d*x + 10*I*c) + 15*d*e^(8*I*d*x + 8*I*
c) + 20*d*e^(6*I*d*x + 6*I*c) + 15*d*e^(4*I*d*x + 4*I*c) + 6*d*e^(2*I*d*x +
 2*I*c) + d)

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\, a \tan(dx+c)+a)^{\frac{3}{2}} \sec(dx+c)^{6}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")

[Out] integrate((I*a*tan(d*x + c) + a)^(3/2)*sec(d*x + c)^6, x)

maple [A] time = 1.72, size = 125, normalized size = 1.42

$$-\frac{2\left(256 i \left(\cos^{6}(dx+c)\right)-256\left(\cos^{5}(dx+c)\right)\sin(dx+c)+32 i\left(\cos^{4}(dx+c)\right)-160\left(\cos^{3}(dx+c)\right)\sin(dx+c)\right.}{1287 d \cos(dx+c)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^(3/2),x)

[Out] -2/1287/d*(256*I*cos(d*x+c)^6-256*cos(d*x+c)^5*sin(d*x+c)+32*I*cos(d*x+c)^4
-160*cos(d*x+c)^3*sin(d*x+c)+14*I*cos(d*x+c)^2-126*cos(d*x+c)*sin(d*x+c)-99
I)(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^6*a

maxima [A] time = 0.33, size = 58, normalized size = 0.66

$$-\frac{2 i\left(99\,(i\, a \tan(dx+c)+a)^{\frac{13}{2}}-468\,(i\, a \tan(dx+c)+a)^{\frac{11}{2}} a+572\,(i\, a \tan(dx+c)+a)^{\frac{9}{2}} a^{2}\right)}{1287\, a^{5} d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")

[Out] -2/1287*I*(99*(I*a*tan(d*x + c) + a)^(13/2) - 468*(I*a*tan(d*x + c) + a)^(1
1/2)*a + 572*(I*a*tan(d*x + c) + a)^(9/2)*a^2)/(a^5*d)

mupad [B] time = 7.31, size = 420, normalized size = 4.77

$$-\frac{a\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,1024\mathrm{i}}{1287\,d}-\frac{a\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,512\mathrm{i}}{1287\,d\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}-\frac{a\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,128\mathrm{i}}{429\,d\,{\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}^2}+\frac{a\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\right.}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}}}}{1287\,d\,\left(\mathrm{e}^{c\,2\mathrm{i}+d}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(3/2)/cos(c + d*x)^6,x)
```

```
[Out] (a*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)
*27136i)/(1287*d*(exp(c*2i + d*x*2i) + 1)^3) - (a*(a - (a*(exp(c*2i + d*x*2
i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*512i)/(1287*d*(exp(c*2i + d
*x*2i) + 1)) - (a*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*
2i) + 1))^(1/2)*128i)/(429*d*(exp(c*2i + d*x*2i) + 1)^2) - (a*(a - (a*(exp(
c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*1024i)/(1287*d)
 - (a*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1
/2)*58624i)/(1287*d*(exp(c*2i + d*x*2i) + 1)^4) + (a*(a - (a*(exp(c*2i + d*
x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*5120i)/(143*d*(exp(c*2i
+ d*x*2i) + 1)^5) - (a*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i +
 d*x*2i) + 1))^(1/2)*128i)/(13*d*(exp(c*2i + d*x*2i) + 1)^6)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6*(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

3.295 $\int \sec^4(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx$

Optimal. Leaf size=59

$$\frac{2i(a+ia\tan(c+dx))^{9/2}}{9a^3d}-\frac{4i(a+ia\tan(c+dx))^{7/2}}{7a^2d}$$

```
[Out] -4/7*I*(a+I*a*tan(d*x+c))^(7/2)/a^2/d+2/9*I*(a+I*a*tan(d*x+c))^(9/2)/a^3/d
```

Rubi [A] time = 0.07, antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 43}

$$\frac{2i(a+ia\tan(c+dx))^{9/2}}{9a^3d}-\frac{4i(a+ia\tan(c+dx))^{7/2}}{7a^2d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((-4*I)/7)*(a + I*a*Tan[c + d*x])^(7/2))/(a^2*d) + (((2*I)/9)*(a + I*a*Tan
[c + d*x])^(9/2))/(a^3*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^4(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)(a+x)^{5/2}\,dx, x, ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(2a(a+x)^{5/2}-(a+x)^{7/2}\right)\,dx, x, ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{4i(a+ia\tan(c+dx))^{7/2}}{7a^2d}+\frac{2i(a+ia\tan(c+dx))^{9/2}}{9a^3d}\end{aligned}$$

Mathematica [A] time = 0.60, size = 81, normalized size = 1.37

$$-\frac{2a(7\tan(c+dx)+11i)\sec^3(c+dx)(\cos(dx)-i\sin(dx))\sqrt{a+ia\tan(c+dx)}\,(\cos(3c+4dx)+i\sin(3c+4dx))}{63d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (-2*a*Sec[c + d*x]^3*(Cos[d*x] - I*Sin[d*x])*(Cos[3*c + 4*d*x] + I*Sin[3*c
 + 4*d*x])*(11*I + 7*Tan[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])/(63*d)
```

fricas [B] time = 0.63, size = 98, normalized size = 1.66

$$\frac{\sqrt{2}\left(-64i\,ae^{(9i\,dx+9i\,c)} - 288i\,ae^{(7i\,dx+7i\,c)}\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}}{63\left(de^{(8i\,dx+8i\,c)} + 4\,de^{(6i\,dx+6i\,c)} + 6\,de^{(4i\,dx+4i\,c)} + 4\,de^{(2i\,dx+2i\,c)} + d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/63*sqrt(2)*(-64*I*a*e^(9*I*d*x + 9*I*c) - 288*I*a*e^(7*I*d*x + 7*I*c))*sq
rt(a/(e^(2*I*d*x + 2*I*c) + 1))/(d*e^(8*I*d*x + 8*I*c) + 4*d*e^(6*I*d*x + 6
*I*c) + 6*d*e^(4*I*d*x + 4*I*c) + 4*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c) + a)^{\frac{3}{2}} \sec(dx+c)^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(3/2)*sec(d*x + c)^4, x)
```

maple [B] time = 1.16, size = 98, normalized size = 1.66

$$-\frac{2\left(16i\left(\cos^4(dx+c)\right) - 16\left(\cos^3(dx+c)\right)\sin(dx+c) + 2i\left(\cos^2(dx+c)\right) - 10\cos(dx+c)\sin(dx+c) - 7i\right)}{63d\cos(dx+c)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] -2/63/d*(16*I*cos(d*x+c)^4-16*cos(d*x+c)^3*sin(d*x+c)+2*I*cos(d*x+c)^2-10*c
os(d*x+c)*sin(d*x+c)-7*I)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/co
s(d*x+c)^4*a
```

maxima [A] time = 0.34, size = 40, normalized size = 0.68

$$\frac{2i\left(7\,(i\,a\tan(dx+c)+a)^{\frac{9}{2}} - 18\,(i\,a\tan(dx+c)+a)^{\frac{7}{2}}a\right)}{63\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 2/63*I*(7*(I*a*tan(d*x + c) + a)^(9/2) - 18*(I*a*tan(d*x + c) + a)^(7/2)*a)
/(a^3*d)
```

mupad [B] time = 6.10, size = 296, normalized size = 5.02

$$-\frac{a\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,64\mathrm{i}}{63\,d} - \frac{a\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,32\mathrm{i}}{63\,d\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)} + \frac{a\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,160\mathrm{i}}{21\,d\,{\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}^2} - \frac{a\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}\right.}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}}}}{63\,d\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(3/2)/cos(c + d*x)^4,x)
```

```
[Out] (a*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)
*160i)/(21*d*(exp(c*2i + d*x*2i) + 1)^2) - (a*(a - (a*(exp(c*2i + d*x*2i)*1
i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*32i)/(63*d*(exp(c*2i + d*x*2i)
+ 1)) - (a*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1
))^(1/2)*64i)/(63*d) - (a*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2
i + d*x*2i) + 1))^(1/2)*608i)/(63*d*(exp(c*2i + d*x*2i) + 1)^3) + (a*(a - (
a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*32i)/(9*
d*(exp(c*2i + d*x*2i) + 1)^4)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ia(\tan(c+dx)-i))^{\frac{3}{2}}\sec^4(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4*(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral((I*a*(tan(c + d*x) - I))**(3/2)*sec(c + d*x)**4, x)
```

3.296 $\int \sec^2(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx$

Optimal. Leaf size=29

$$-\frac{2i(a+ia\tan(c+dx))^{5/2}}{5ad}$$

```
[Out] -2/5*I*(a+I*a*tan(d*x+c))^(5/2)/a/d
```

Rubi [A] time = 0.06, antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 32}

$$-\frac{2i(a+ia\tan(c+dx))^{5/2}}{5ad}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((-2*I)/5)*(a + I*a*Tan[c + d*x])^(5/2))/(a*d)
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^2(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx &= -\frac{i\,\text{Subst}\left(\int (a+x)^{3/2}\,dx, x, ia\tan(c+dx)\right)}{ad}\\ &= -\frac{2i(a+ia\tan(c+dx))^{5/2}}{5ad}\end{aligned}$$

Mathematica [B] time = 0.34, size = 69, normalized size = 2.38

$$\frac{2a\sec^2(c+dx)(\cos(dx)-i\sin(dx))\sqrt{a+ia\tan(c+dx)}\,(\sin(2c+3dx)-i\cos(2c+3dx))}{5d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (2*a*Sec[c + d*x]^2*(Cos[d*x] - I*Sin[d*x])*((-I)*Cos[2*c + 3*d*x] + Sin[2*
c + 3*d*x])*Sqrt[a + I*a*Tan[c + d*x]])/(5*d)
```

fricas [B] time = 0.69, size = 59, normalized size = 2.03

$$-\frac{8i\sqrt{2}\,a\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\,e^{(5i\,dx+5i\,c)}}{5\left(de^{(4i\,dx+4i\,c)}+2\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] -8/5*I*sqrt(2)*a*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(5*I*d*x + 5*I*c)/(d*e
^(4*I*d*x + 4*I*c) + 2*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i a \tan (dx + c) + a)^{\frac{3}{2}} \sec (dx + c)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(3/2)*sec(d*x + c)^2, x)
```

maple [A] time = 0.18, size = 24, normalized size = 0.83

$$-\frac{2i (a + ia \tan (dx + c))^{\frac{5}{2}}}{5da}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] -2/5*I*(a+I*a*tan(d*x+c))^(5/2)/d/a
```

maxima [A] time = 0.37, size = 21, normalized size = 0.72

$$-\frac{2i (i a \tan (dx + c) + a)^{\frac{5}{2}}}{5 ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] -2/5*I*(I*a*tan(d*x + c) + a)^(5/2)/(a*d)
```

mupad [B] time = 1.36, size = 153, normalized size = 5.28

$$-\frac{4 a \sqrt{\frac{a (\cos(2 c+2 d x)+1+\sin(2 c+2 d x) 1i)}{\cos(2 c+2 d x)+1}} (\cos (2 c + 2 d x) 7i + \cos (4 c + 4 d x) 4i + \cos (6 c + 6 d x) 1i - 5 \sin (2 c +}{5 d (15 \cos (2 c + 2 d x) + 6 \cos (4 c + 4 d x) + \cos (6 c + 6 d x) +}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(3/2)/cos(c + d*x)^2,x)
```

```
[Out] -(4*a*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) +
 1))^(1/2)*(cos(2*c + 2*d*x)*7i + cos(4*c + 4*d*x)*4i + cos(6*c + 6*d*x)*1i
 - 5*sin(2*c + 2*d*x) - 4*sin(4*c + 4*d*x) - sin(6*c + 6*d*x) + 4i))/(5*d*(
15*cos(2*c + 2*d*x) + 6*cos(4*c + 4*d*x) + cos(6*c + 6*d*x) + 10))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ia (\tan (c + dx) - i))^{\frac{3}{2}} \sec^2 (c + dx) \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2*(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral((I*a*(tan(c + d*x) - I))**(3/2)*sec(c + d*x)**2, x)
```

3.297 $\int \cos^2(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx$

Optimal. Leaf size=93

$$-\frac{ia^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{2\sqrt{2}d}-\frac{ia^2\sqrt{a+ia\tan(c+dx)}}{2d(a-ia\tan(c+dx))}$$

```
[Out] -1/4*I*a^(3/2)*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))/d*2^(1
/2)-1/2*I*a^2*(a+I*a*tan(d*x+c))^(1/2)/d/(a-I*a*tan(d*x+c))
```

Rubi [A] time = 0.08, antiderivative size = 93, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3487, 51, 63, 206}

$$-\frac{ia^2\sqrt{a+ia\tan(c+dx)}}{2d(a-ia\tan(c+dx))}-\frac{ia^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{2\sqrt{2}d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] ((-I/2)*a^(3/2)*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a])])/(Sqr
t[2]*d) - ((I/2)*a^2*Sqrt[a + I*a*Tan[c + d*x]])/(d*(a - I*a*Tan[c + d*x]))
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^2(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx = -\frac{\left(ia^3\right)\text{Subst}\left(\int \frac{1}{(a-x)^2\sqrt{a+x}}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{ia^2\sqrt{a+ia\tan(c+dx)}}{2d(a-ia\tan(c+dx))} - \frac{\left(ia^2\right)\text{Subst}\left(\int \frac{1}{(a-x)\sqrt{a+x}}\,dx, x, ia\tan(c+ \ldots}{4d}$$

$$= -\frac{ia^2\sqrt{a+ia\tan(c+dx)}}{2d(a-ia\tan(c+dx))} - \frac{\left(ia^2\right)\text{Subst}\left(\int \frac{1}{2a-x^2}\,dx, x, \sqrt{a+ia\tan(c+ \ldots}{2d}$$

$$= -\frac{ia^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{2\sqrt{2}\,d} - \frac{ia^2\sqrt{a+ia\tan(c+dx)}}{2d(a-ia\tan(c+dx))}$$

Mathematica [A] time = 0.64, size = 97, normalized size = 1.04

$$-\frac{iae^{-i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\left(e^{i(c+dx)}\sqrt{1+e^{2i(c+dx)}}+\sinh^{-1}\left(e^{i(c+dx)}\right)\right)\sqrt{a+ia\tan(c+dx)}}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] ((-1/4*I)*a*Sqrt[1 + E^((2*I)*(c + d*x))]*(E^(I*(c + d*x))*Sqrt[1 + E^((2*I
)*(c + d*x))] + ArcSinh[E^(I*(c + d*x))])*Sqrt[a + I*a*Tan[c + d*x]])/(d*E^
(I*(c + d*x)))
```

fricas [B] time = 0.46, size = 241, normalized size = 2.59

$$\frac{\sqrt{\frac{1}{2}}\sqrt{-\frac{a^3}{d^2}}\,d\log\left(\frac{\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(4i\,de^{(2i\,dx+2i\,c)}+4i\,d\right)\sqrt{-\frac{a^3}{d^2}}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}+4\,a^2e^{(i\,dx+i\,c)}\right)e^{(-i\,dx-i\,c)}}{a}\right)-\sqrt{\frac{1}{2}}\sqrt{-\frac{a^3}{d^2}}\,d\log\left(\frac{\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(-4i\,de^{(2i\,dx+ \ldots}{\ldots}\right)}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/4*(sqrt(1/2)*sqrt(-a^3/d^2)*d*log((sqrt(2)*sqrt(1/2)*(4*I*d*e^(2*I*d*x +
2*I*c) + 4*I*d)*sqrt(-a^3/d^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)) + 4*a^2*e^
(I*d*x + I*c))*e^(-I*d*x - I*c)/a) - sqrt(1/2)*sqrt(-a^3/d^2)*d*log((sqrt(2
)*sqrt(1/2)*(-4*I*d*e^(2*I*d*x + 2*I*c) - 4*I*d)*sqrt(-a^3/d^2)*sqrt(a/(e^(
2*I*d*x + 2*I*c) + 1)) + 4*a^2*e^(I*d*x + I*c))*e^(-I*d*x - I*c)/a) + sqrt(
2)*(-I*a*e^(3*I*d*x + 3*I*c) - I*a*e^(I*d*x + I*c))*sqrt(a/(e^(2*I*d*x + 2*
I*c) + 1)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(3/2)*cos(d*x + c)^2, x)
```

maple [B] time = 1.27, size = 398, normalized size = 4.28

$$-\frac{\left(-i\sin\left(dx+c\right)\cos\left(dx+c\right)\operatorname{arctanh}\left(\frac{\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\,\sin(dx+c)\sqrt{2}}{2\cos(dx+c)}\right)\left(-\frac{2\cos(dx+c)}{1+\cos(dx+c)}\right)^{\frac{3}{2}}\sqrt{2}-\sin\left(dx+c\right)\cos\left(dx+c\right)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] -1/8/d*(-I*cos(d*x+c)*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(3/2)*arcta
nh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*
2^(1/2)-sin(d*x+c)*cos(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(3/2)*arctan(1
/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)-I*(-2*cos(d*x+c)/(
1+cos(d*x+c)))^(3/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d
*x+c)/cos(d*x+c)*2^(1/2))*2^(1/2)*sin(d*x+c)-2^(1/2)*arctan(1/2*(-2*cos(d*x
+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(3/2)*sin
(d*x+c)+8*I*cos(d*x+c)^4-8*cos(d*x+c)^3*sin(d*x+c)-4*I*cos(d*x+c)^3+4*cos(d
*x+c)^2*sin(d*x+c)-4*I*cos(d*x+c)^2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c
))^(1/2)/(I*sin(d*x+c)+cos(d*x+c)-1)/cos(d*x+c)*a
```

maxima [A] time = 0.80, size = 98, normalized size = 1.05

$$\frac{i\left(\sqrt{2}\,a^{\frac{5}{2}}\log\left(-\frac{\sqrt{2}\,\sqrt{a}-\sqrt{i\,a\tan\left(dx+c\right)+a}}{\sqrt{2}\,\sqrt{a}+\sqrt{i\,a\tan\left(dx+c\right)+a}}\right)+\frac{16\,\sqrt{i\,a\tan\left(dx+c\right)+a}\,a^{3}}{4i\,a\tan\left(dx+c\right)-4\,a}\right)}{8\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 1/8*I*(sqrt(2)*a^(5/2)*log(-(sqrt(2)*sqrt(a) - sqrt(I*a*tan(d*x + c) + a))/
(sqrt(2)*sqrt(a) + sqrt(I*a*tan(d*x + c) + a))) + 16*sqrt(I*a*tan(d*x + c)
+ a)*a^3/(4*I*a*tan(d*x + c) - 4*a))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \cos\left(c+d\,x\right)^2\,{\left(a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^(3/2),x)
```

```
[Out] int(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2*(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

3.298 $\int \cos^4(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx$

Optimal. Leaf size=166

$$-\frac{15ia^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{32\sqrt{2}\,d}-\frac{ia^4}{4d(a-ia\tan(c+dx))^2\sqrt{a+ia\tan(c+dx)}}-\frac{5ia^3}{16d(a-ia\tan(c+dx))\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] -15/64*I*a^(3/2)*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))/d*2^
(1/2)+15/32*I*a^2/d/(a+I*a*tan(d*x+c))^(1/2)-1/4*I*a^4/d/(a+I*a*tan(d*x+c))
^(1/2)/(a-I*a*tan(d*x+c))^2-5/16*I*a^3/d/(a+I*a*tan(d*x+c))^(1/2)/(a-I*a*ta
n(d*x+c))
```

Rubi [A] time = 0.11, antiderivative size = 166, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3487, 51, 63, 206}

$$-\frac{ia^4}{4d(a-ia\tan(c+dx))^2\sqrt{a+ia\tan(c+dx)}}-\frac{5ia^3}{16d(a-ia\tan(c+dx))\sqrt{a+ia\tan(c+dx)}}+\frac{15ia^2}{32d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((-15*I)/32)*a^(3/2)*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a])]
)/(Sqrt[2]*d) + (((15*I)/32)*a^2)/(d*Sqrt[a + I*a*Tan[c + d*x]]) - ((I/4)*a
^4)/(d*(a - I*a*Tan[c + d*x])^2*Sqrt[a + I*a*Tan[c + d*x]]) - (((5*I)/16)*a
^3)/(d*(a - I*a*Tan[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^4(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx = -\frac{\left(ia^5\right)\text{Subst}\left(\int \frac{1}{(a-x)^3(a+x)^{3/2}}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{ia^4}{4d(a-ia\tan(c+dx))^2\sqrt{a+ia\tan(c+dx)}} - \frac{\left(5ia^4\right)\text{Subst}\left(\int \frac{}{(a-}\right.}{}$$

$$= -\frac{ia^4}{4d(a-ia\tan(c+dx))^2\sqrt{a+ia\tan(c+dx)}} - \frac{}{16d(a-ia\tan(c+}$$

$$= \frac{15ia^2}{32d\sqrt{a+ia\tan(c+dx)}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2\sqrt{a+ia\tan(c+}}$$

$$= \frac{15ia^2}{32d\sqrt{a+ia\tan(c+dx)}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2\sqrt{a+ia\tan(c+}}$$

$$= -\frac{15ia^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{32\sqrt{2}\,d} + \frac{15ia^2}{32d\sqrt{a+ia\tan(c+dx)}} - \frac{}{4d(a}$$

Mathematica [A] time = 0.84, size = 143, normalized size = 0.86

$$\frac{ae^{-2i(c+dx)}\cos^2(c+dx)(\tan(c+dx)-i)\left(\sqrt{1+e^{2i(c+dx)}}\left(9e^{2i(c+dx)}+2e^{4i(c+dx)}-8\right)+15e^{i(c+dx)}\sinh^{-1}\left(e^{i(c+dx)}\right)\right)}{32d\sqrt{1+e^{2i(c+dx)}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (a*(Sqrt[1 + E^((2*I)*(c + d*x))]*(-8 + 9*E^((2*I)*(c + d*x)) + 2*E^((4*I)*
(c + d*x))) + 15*E^(I*(c + d*x))*ArcSinh[E^(I*(c + d*x))])*Cos[c + d*x]^2*(
-I + Tan[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])/(32*d*E^((2*I)*(c + d*x))*Sq
rt[1 + E^((2*I)*(c + d*x))])
```

fricas [B] time = 0.47, size = 286, normalized size = 1.72

$$\frac{\left(15\sqrt{\frac{1}{2}}\sqrt{-\frac{a^3}{d^2}}\,de^{(i\,dx+i\,c)}\log\left(\frac{\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(64i\,de^{(2i\,dx+2i\,c)}+64i\,d\right)\sqrt{-\frac{a^3}{d^2}}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}+64\,a^2e^{(i\,dx+i\,c)}\right)e^{(-i\,dx-i\,c)}}{16\,a}\right)-15\sqrt{\frac{1}{2}}\sqrt{-\frac{a^3}{d^2}}\,de^{(i}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/64*(15*sqrt(1/2)*sqrt(-a^3/d^2)*d*e^(I*d*x + I*c)*log(1/16*(sqrt(2)*sqrt(
1/2)*(64*I*d*e^(2*I*d*x + 2*I*c) + 64*I*d)*sqrt(-a^3/d^2)*sqrt(a/(e^(2*I*d*
x + 2*I*c) + 1)) + 64*a^2*e^(I*d*x + I*c))*e^(-I*d*x - I*c)/a) - 15*sqrt(1/
2)*sqrt(-a^3/d^2)*d*e^(I*d*x + I*c)*log(1/16*(sqrt(2)*sqrt(1/2)*(-64*I*d*e^
(2*I*d*x + 2*I*c) - 64*I*d)*sqrt(-a^3/d^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)
) + 64*a^2*e^(I*d*x + I*c))*e^(-I*d*x - I*c)/a) + sqrt(2)*(-2*I*a*e^(6*I*d*
x + 6*I*c) - 11*I*a*e^(4*I*d*x + 4*I*c) - I*a*e^(2*I*d*x + 2*I*c) + 8*I*a)*
sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)))*e^(-I*d*x - I*c)/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(3/2)*cos(d*x + c)^4, x)
```

maple [B] time = 1.32, size = 742, normalized size = 4.47

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] 1/512/d*(128*I*cos(d*x+c)^7+240*I*cos(d*x+c)^4+15*cos(d*x+c)^3*2^(1/2)*sin(
d*x+c)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x
+c)/(1+cos(d*x+c)))^(7/2)-32*I*cos(d*x+c)^6+45*cos(d*x+c)^2*2^(1/2)*sin(d*x
+c)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)
/(1+cos(d*x+c)))^(7/2)-80*I*cos(d*x+c)^5+45*cos(d*x+c)*2^(1/2)*sin(d*x+c)*a
rctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+c
os(d*x+c)))^(7/2)+15*2^(1/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2
)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(7/2)*sin(d*x+c)+15*I*2^(1/2)*sin
(d*x+c)*cos(d*x+c)^3*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(7/2)*arctanh(1/2*(-2*c
os(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))-256*I*cos(d*
x+c)^8+256*sin(d*x+c)*cos(d*x+c)^7+15*I*2^(1/2)*arctanh(1/2*(-2*cos(d*x+c)/
(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(
d*x+c)))^(7/2)*sin(d*x+c)-128*sin(d*x+c)*cos(d*x+c)^6+45*I*2^(1/2)*sin(d*x+
c)*cos(d*x+c)^2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(7/2)*arctanh(1/2*(-2*cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))+160*cos(d*x+c)^5*
sin(d*x+c)+45*I*2^(1/2)*sin(d*x+c)*cos(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c))
)^(7/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x
+c)*2^(1/2))-240*sin(d*x+c)*cos(d*x+c)^4)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(
d*x+c))^(1/2)/(I*sin(d*x+c)+cos(d*x+c)-1)/cos(d*x+c)^3*a
```

maxima [A] time = 0.89, size = 158, normalized size = 0.95

$$\frac{i\left(15\sqrt{2}a^{\frac{5}{2}}\log\left(-\frac{\sqrt{2}\sqrt{a}-\sqrt{ia\tan(dx+c)+a}}{\sqrt{2}\sqrt{a}+\sqrt{ia\tan(dx+c)+a}}\right)+\frac{4\left(15\left(ia\tan(dx+c)+a\right)^{2}a^{3}-50\left(ia\tan(dx+c)+a\right)a^{4}+32a^{5}\right)}{\left(ia\tan(dx+c)+a\right)^{\frac{5}{2}}-4\left(ia\tan(dx+c)+a\right)^{\frac{3}{2}}a+4\sqrt{ia\tan(dx+c)+a}\,a^{2}}\right)}{128\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 1/128*I*(15*sqrt(2)*a^(5/2)*log(-(sqrt(2)*sqrt(a) - sqrt(I*a*tan(d*x + c) +
 a))/(sqrt(2)*sqrt(a) + sqrt(I*a*tan(d*x + c) + a))) + 4*(15*(I*a*tan(d*x +
 c) + a)^2*a^3 - 50*(I*a*tan(d*x + c) + a)*a^4 + 32*a^5)/((I*a*tan(d*x + c)
 + a)^(5/2) - 4*(I*a*tan(d*x + c) + a)^(3/2)*a + 4*sqrt(I*a*tan(d*x + c) +
a)*a^2))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \cos\left(c+d\,x\right)^4\,{\left(a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^(3/2),x)
```

```
[Out] int(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4*(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

3.299 $\int \cos^6(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx$

Optimal. Leaf size=239

$$-\frac{105ia^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{256\sqrt{2}\,d}-\frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{3/2}}-\frac{3ia^5}{16d(a-ia\tan(c+dx))^2(a+ia\cdots}$$

```
[Out] -105/512*I*a^(3/2)*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))/d*
2^(1/2)+105/256*I*a^2/d/(a+I*a*tan(d*x+c))^(1/2)+35/128*I*a^3/d/(a+I*a*tan(
d*x+c))^(3/2)-1/6*I*a^6/d/(a-I*a*tan(d*x+c))^3/(a+I*a*tan(d*x+c))^(3/2)-3/1
6*I*a^5/d/(a-I*a*tan(d*x+c))^2/(a+I*a*tan(d*x+c))^(3/2)-21/64*I*a^4/d/(a-I*
a*tan(d*x+c))/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.13, antiderivative size = 239, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = $\{3487, 51, 63, 206\}$

$$-\frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{3/2}}-\frac{3ia^5}{16d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{3/2}}-\frac{\cdots}{64d(a-ia\tan(c\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^6*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((-105*I)/256)*a^(3/2)*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a]
)])/(Sqrt[2]*d) + (((35*I)/128)*a^3)/(d*(a + I*a*Tan[c + d*x])^(3/2)) - ((I
/6)*a^6)/(d*(a - I*a*Tan[c + d*x])^3*(a + I*a*Tan[c + d*x])^(3/2)) - (((3*I
)/16)*a^5)/(d*(a - I*a*Tan[c + d*x])^2*(a + I*a*Tan[c + d*x])^(3/2)) - (((2
1*I)/64)*a^4)/(d*(a - I*a*Tan[c + d*x])*(a + I*a*Tan[c + d*x])^(3/2)) + (((
105*I)/256)*a^2)/(d*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
```

```
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^6(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx = -\frac{\left(ia^7\right)\text{Subst}\left(\int \frac{1}{(a-x)^4(a+x)^{5/2}}\,dx,x,ia\tan(c+dx)\right)}{d}$$

$$= -\frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{3/2}} - \frac{\left(3ia^6\right)\text{Subst}\left(\int \right.}{}$$

$$= -\frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{3/2}} - \frac{}{16d(a-ia\tan(c}$$

$$= -\frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{3/2}} - \frac{}{16d(a-ia\tan(c}$$

$$= \frac{35ia^3}{128d(a+ia\tan(c+dx))^{3/2}} - \frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c}$$

$$= \frac{35ia^3}{128d(a+ia\tan(c+dx))^{3/2}} - \frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c}$$

$$= \frac{35ia^3}{128d(a+ia\tan(c+dx))^{3/2}} - \frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c}$$

$$= -\frac{105ia^{3/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{256\sqrt{2}d} + \frac{35ia^3}{128d(a+ia\tan(c+dx))^{3/2}} -$$

Mathematica [A] time = 1.11, size = 169, normalized size = 0.71

$$\frac{ae^{-4i(c+dx)}\cos^2(c+dx)(\tan(c+dx)-i)\left(\sqrt{1+e^{2i(c+dx)}}\left(-208e^{2i(c+dx)}+165e^{4i(c+dx)}+50e^{6i(c+dx)}+8e^{8i(c+dx)}-1\right.\right.}{768d\sqrt{1+e^{2i(c+dx)}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^6*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (a*(Sqrt[1 + E^((2*I)*(c + d*x))]*(-16 - 208*E^((2*I)*(c + d*x)) + 165*E^((
4*I)*(c + d*x)) + 50*E^((6*I)*(c + d*x)) + 8*E^((8*I)*(c + d*x))) + 315*E^(
(3*I)*(c + d*x))*ArcSinh[E^(I*(c + d*x))])*Cos[c + d*x]^2*(-I + Tan[c + d*x
])*Sqrt[a + I*a*Tan[c + d*x]])/(768*d*E^((4*I)*(c + d*x))*Sqrt[1 + E^((2*I)
*(c + d*x))])
```

fricas [A] time = 0.82, size = 310, normalized size = 1.30

$$\left(315\sqrt{\frac{1}{2}}\sqrt{-\frac{a^3}{d^2}}de^{(3i\,dx+3i\,c)}\log\left(\frac{\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(512i\,de^{(2i\,dx+2i\,c)}+512i\,d\right)\sqrt{-\frac{a^3}{d^2}}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}+512\,a^2e^{(i\,dx+i\,c)}\right)e^{(-i\,dx-i\,c)}}{128\,a}\right)-315\sqrt{\frac{1}{2}}\sqrt{-}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/1536*(315*sqrt(1/2)*sqrt(-a^3/d^2)*d*e^(3*I*d*x + 3*I*c)*log(1/128*(sqrt(
2)*sqrt(1/2)*(512*I*d*e^(2*I*d*x + 2*I*c) + 512*I*d)*sqrt(-a^3/d^2)*sqrt(a/
```

```
(e^(2*I*d*x + 2*I*c) + 1)) + 512*a^2*e^(I*d*x + I*c))*e^(-I*d*x - I*c)/a) -
 315*sqrt(1/2)*sqrt(-a^3/d^2)*d*e^(3*I*d*x + 3*I*c)*log(1/128*(sqrt(2)*sqrt
(1/2)*(-512*I*d*e^(2*I*d*x + 2*I*c) - 512*I*d)*sqrt(-a^3/d^2)*sqrt(a/(e^(2*
I*d*x + 2*I*c) + 1)) + 512*a^2*e^(I*d*x + I*c))*e^(-I*d*x - I*c)/a) + sqrt(
2)*(-8*I*a*e^(10*I*d*x + 10*I*c) - 58*I*a*e^(8*I*d*x + 8*I*c) - 215*I*a*e^(
6*I*d*x + 6*I*c) + 43*I*a*e^(4*I*d*x + 4*I*c) + 224*I*a*e^(2*I*d*x + 2*I*c)
 + 16*I*a)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)))*e^(-3*I*d*x - 3*I*c)/d
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 1.51, size = 1086, normalized size = 4.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] 1/49152/d*(315*I*2^(1/2)*sin(d*x+c)*cos(d*x+c)^5*arctanh(1/2*(-2*cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos
(d*x+c)))^(11/2)+1575*I*2^(1/2)*sin(d*x+c)*cos(d*x+c)^4*arctanh(1/2*(-2*cos
(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)
/(1+cos(d*x+c)))^(11/2)+315*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*arctan(1/
2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)*sin(d*x+c)+16384*si
n(d*x+c)*cos(d*x+c)^11+9216*sin(d*x+c)*cos(d*x+c)^9-10752*sin(d*x+c)*cos(d*
x+c)^8-8192*sin(d*x+c)*cos(d*x+c)^10+315*sin(d*x+c)*cos(d*x+c)^5*(-2*cos(d*
x+c)/(1+cos(d*x+c)))^(11/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*2^(1/2))*2^(1/2)+1575*sin(d*x+c)*cos(d*x+c)^4*(-2*cos(d*x+c)/(1+cos(d*x+c)
))^(11/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)+
3150*sin(d*x+c)*cos(d*x+c)^3*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*arctan(1
/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)+3150*sin(d*x+c)*co
s(d*x+c)^2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*arctan(1/2*(-2*cos(d*x+c)/
(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)+1575*sin(d*x+c)*cos(d*x+c)*(-2*cos(d
*x+c)/(1+cos(d*x+c)))^(11/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2
)*2^(1/2))*2^(1/2)+13440*sin(d*x+c)*cos(d*x+c)^7-20160*sin(d*x+c)*cos(d*x+c
)^6+3150*I*2^(1/2)*sin(d*x+c)*cos(d*x+c)^3*arctanh(1/2*(-2*cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c
)))^(11/2)-16384*I*cos(d*x+c)^12+8192*I*cos(d*x+c)^11-1024*I*cos(d*x+c)^10-
1536*I*cos(d*x+c)^9-2688*I*cos(d*x+c)^8-6720*I*cos(d*x+c)^7+20160*I*cos(d*x
+c)^6+3150*I*2^(1/2)*sin(d*x+c)*cos(d*x+c)^2*arctanh(1/2*(-2*cos(d*x+c)/(1+
cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x
+c)))^(11/2)+1575*I*2^(1/2)*sin(d*x+c)*cos(d*x+c)*arctanh(1/2*(-2*cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+co
s(d*x+c)))^(11/2)+315*I*2^(1/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*
sin(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/(I*sin(d*x+c)+co
s(d*x+c)-1)/cos(d*x+c)^5*a
```

maxima [A] time = 0.81, size = 212, normalized size = 0.89

$$\frac{i\left(315\,\sqrt{2}\,a^{\frac{5}{2}}\log\left(-\frac{\sqrt{2}\,\sqrt{a}-\sqrt{i\,a\tan(dx+c)+a}}{\sqrt{2}\,\sqrt{a}+\sqrt{i\,a\tan(dx+c)+a}}\right)+\frac{4\left(315\,(i\,a\tan(dx+c)+a)^{4}a^{3}-1680\,(i\,a\tan(dx+c)+a)^{3}a^{4}+2772\,(i\,a\tan(dx+c)+a)^{2}a^{5}-1152\,(i\,a\right.}{(i\,a\tan(dx+c)+a)^{\frac{9}{2}}-6\,(i\,a\tan(dx+c)+a)^{\frac{7}{2}}a+12\,(i\,a\tan(dx+c)+a)^{\frac{5}{2}}a^{2}-8\,(i\,a\tan(d}}{3072\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 1/3072*I*(315*sqrt(2)*a^(5/2)*log(-(sqrt(2)*sqrt(a) - sqrt(I*a*tan(d*x + c)
 + a))/(sqrt(2)*sqrt(a) + sqrt(I*a*tan(d*x + c) + a))) + 4*(315*(I*a*tan(d*
x + c) + a)^4*a^3 - 1680*(I*a*tan(d*x + c) + a)^3*a^4 + 2772*(I*a*tan(d*x +
 c) + a)^2*a^5 - 1152*(I*a*tan(d*x + c) + a)*a^6 - 256*a^7)/((I*a*tan(d*x +
 c) + a)^(9/2) - 6*(I*a*tan(d*x + c) + a)^(7/2)*a + 12*(I*a*tan(d*x + c) +
a)^(5/2)*a^2 - 8*(I*a*tan(d*x + c) + a)^(3/2)*a^3))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \cos\left(c+d\,x\right)^6\,{\left(a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^(3/2),x)
```

```
[Out] int(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**6*(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

3.300 $\int \sec^5(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx$

Optimal. Leaf size=147

$$\frac{256ia^4\sec^5(c+dx)}{1155d(a+ia\tan(c+dx))^{5/2}}+\frac{64ia^3\sec^5(c+dx)}{231d(a+ia\tan(c+dx))^{3/2}}+\frac{8ia^2\sec^5(c+dx)}{33d\sqrt{a+ia\tan(c+dx)}}+\frac{2ia\sec^5(c+dx)\sqrt{a+ia\tan(c+dx)}}{11d}$$

```
[Out] 8/33*I*a^2*sec(d*x+c)^5/d/(a+I*a*tan(d*x+c))^(1/2)+2/11*I*a*sec(d*x+c)^5*(a
+I*a*tan(d*x+c))^(1/2)/d+256/1155*I*a^4*sec(d*x+c)^5/d/(a+I*a*tan(d*x+c))^(
5/2)+64/231*I*a^3*sec(d*x+c)^5/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.24, antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {3494, 3493}

$$\frac{8ia^2\sec^5(c+dx)}{33d\sqrt{a+ia\tan(c+dx)}}+\frac{64ia^3\sec^5(c+dx)}{231d(a+ia\tan(c+dx))^{3/2}}+\frac{256ia^4\sec^5(c+dx)}{1155d(a+ia\tan(c+dx))^{5/2}}+\frac{2ia\sec^5(c+dx)\sqrt{a+ia\tan(c+dx)}}{11d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^5*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((256*I)/1155)*a^4*Sec[c + d*x]^5)/(d*(a + I*a*Tan[c + d*x])^(5/2)) + (((6
4*I)/231)*a^3*Sec[c + d*x]^5)/(d*(a + I*a*Tan[c + d*x])^(3/2)) + (((8*I)/33
)*a^2*Sec[c + d*x]^5)/(d*Sqrt[a + I*a*Tan[c + d*x]]) + (((2*I)/11)*a*Sec[c
+ d*x]^5*Sqrt[a + I*a*Tan[c + d*x]])/d
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int \sec^5(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx &= \frac{2ia\sec^5(c+dx)\sqrt{a+ia\tan(c+dx)}}{11d}+\frac{1}{11}(12a)\int \sec^5(c+dx)\sqrt{a+i\ldots}\\ &= \frac{8ia^2\sec^5(c+dx)}{33d\sqrt{a+ia\tan(c+dx)}}+\frac{2ia\sec^5(c+dx)\sqrt{a+ia\tan(c+dx)}}{11d}+\frac{1}{33}\ldots\\ &= \frac{64ia^3\sec^5(c+dx)}{231d(a+ia\tan(c+dx))^{3/2}}+\frac{8ia^2\sec^5(c+dx)}{33d\sqrt{a+ia\tan(c+dx)}}+\frac{2ia\sec^5(c+\ldots}{}\\ &= \frac{256ia^4\sec^5(c+dx)}{1155d(a+ia\tan(c+dx))^{5/2}}+\frac{64ia^3\sec^5(c+dx)}{231d(a+ia\tan(c+dx))^{3/2}}+\frac{8ia^2\ldots}{33d\sqrt{a+\ldots}}\end{aligned}$$

Mathematica [A] time = 1.06, size = 109, normalized size = 0.74

$$\frac{2a\sec^4(c+dx)(\cos(dx)-i\sin(dx))\sqrt{a+ia\tan(c+dx)}\,(\sin(3c+2dx)+i\cos(3c+2dx))(494\cos(2(c+dx))+11\ldots}{1155d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^5*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (2*a*Sec[c + d*x]^4*(Cos[d*x] - I*Sin[d*x])*(I*Cos[3*c + 2*d*x] + Sin[3*c +
 2*d*x])*(39 + 494*Cos[2*(c + d*x)] + (215*I)*Sec[c + d*x]*Sin[3*(c + d*x)]
 + (110*I)*Tan[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])/(1155*d)
```

fricas [A] time = 0.64, size = 125, normalized size = 0.85

$$\frac{\sqrt{2}\left(14784 i\, a e^{(6 i\, dx+6 i\, c)}+12672 i\, a e^{(4 i\, dx+4 i\, c)}+5632 i\, a e^{(2 i\, dx+2 i\, c)}+1024 i\, a\right)\sqrt{\frac{a}{e^{(2 i\, dx+2 i\, c)}+1}}}{1155\left(d e^{(10 i\, dx+10 i\, c)}+5\, d e^{(8 i\, dx+8 i\, c)}+10\, d e^{(6 i\, dx+6 i\, c)}+10\, d e^{(4 i\, dx+4 i\, c)}+5\, d e^{(2 i\, dx+2 i\, c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/1155*sqrt(2)*(14784*I*a*e^(6*I*d*x + 6*I*c) + 12672*I*a*e^(4*I*d*x + 4*I*
c) + 5632*I*a*e^(2*I*d*x + 2*I*c) + 1024*I*a)*sqrt(a/(e^(2*I*d*x + 2*I*c) +
 1))/(d*e^(10*I*d*x + 10*I*c) + 5*d*e^(8*I*d*x + 8*I*c) + 10*d*e^(6*I*d*x +
 6*I*c) + 10*d*e^(4*I*d*x + 4*I*c) + 5*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\, a \tan(dx + c) + a)^{\frac{3}{2}} \sec(dx + c)^{5}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(3/2)*sec(d*x + c)^5, x)
```

maple [A] time = 1.31, size = 125, normalized size = 0.85

$$\frac{2\left(512 i\left(\cos^{6}(dx+c)\right)+512\left(\cos^{5}(dx+c)\right)\sin(dx+c)-64 i\left(\cos^{4}(dx+c)\right)+192\left(\cos^{3}(dx+c)\right)\sin(dx+c\right.}{1155 d \cos(dx+c)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^5*(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] 2/1155/d*(512*I*cos(d*x+c)^6+512*cos(d*x+c)^5*sin(d*x+c)-64*I*cos(d*x+c)^4+
192*cos(d*x+c)^3*sin(d*x+c)-20*I*cos(d*x+c)^2+140*cos(d*x+c)*sin(d*x+c)+105
*I)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^5*a
```

maxima [B] time = 21.08, size = 996, normalized size = 6.78

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] -(-17075520*I*sqrt(2)*a*cos(6*d*x + 6*c) - 14636160*I*sqrt(2)*a*cos(4*d*x +
 4*c) - 6504960*I*sqrt(2)*a*cos(2*d*x + 2*c) + 17075520*sqrt(2)*a*sin(6*d*x
 + 6*c) + 14636160*sqrt(2)*a*sin(4*d*x + 4*c) + 6504960*sqrt(2)*a*sin(2*d*x
 + 2*c) - 1182720*I*sqrt(2)*a)*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2
*cos(2*d*x + 2*c) + 1)^(1/4)*sqrt(a)/(((5336100*cos(2*d*x + 2*c)^3 + 133402
5*(4*cos(2*d*x + 2*c) + 1)*sin(2*d*x + 2*c)^2 + 5336100*I*sin(2*d*x + 2*c)^
3 + 1334025*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) +
```

```
 1)*cos(8*d*x + 8*c) + 5336100*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2
*cos(2*d*x + 2*c) + 1)*cos(6*d*x + 6*c) + 8004150*(cos(2*d*x + 2*c)^2 + sin
(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*cos(4*d*x + 4*c) + 12006225*cos(2
*d*x + 2*c)^2 - (-1334025*I*cos(2*d*x + 2*c)^2 - 1334025*I*sin(2*d*x + 2*c)
^2 - 2668050*I*cos(2*d*x + 2*c) - 1334025*I)*sin(8*d*x + 8*c) - (-5336100*I
*cos(2*d*x + 2*c)^2 - 5336100*I*sin(2*d*x + 2*c)^2 - 10672200*I*cos(2*d*x +
 2*c) - 5336100*I)*sin(6*d*x + 6*c) - (-8004150*I*cos(2*d*x + 2*c)^2 - 8004
150*I*sin(2*d*x + 2*c)^2 - 16008300*I*cos(2*d*x + 2*c) - 8004150*I)*sin(4*d
*x + 4*c) - (-5336100*I*cos(2*d*x + 2*c)^2 - 10672200*I*cos(2*d*x + 2*c) -
5336100*I)*sin(2*d*x + 2*c) + 8004150*cos(2*d*x + 2*c) + 1334025)*cos(3/2*a
rctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - (-5336100*I*cos(2*d*x + 2
*c)^3 + (-5336100*I*cos(2*d*x + 2*c) - 1334025*I)*sin(2*d*x + 2*c)^2 + 5336
100*sin(2*d*x + 2*c)^3 + (-1334025*I*cos(2*d*x + 2*c)^2 - 1334025*I*sin(2*d
*x + 2*c)^2 - 2668050*I*cos(2*d*x + 2*c) - 1334025*I)*cos(8*d*x + 8*c) + (-
5336100*I*cos(2*d*x + 2*c)^2 - 5336100*I*sin(2*d*x + 2*c)^2 - 10672200*I*co
s(2*d*x + 2*c) - 5336100*I)*cos(6*d*x + 6*c) + (-8004150*I*cos(2*d*x + 2*c)
^2 - 8004150*I*sin(2*d*x + 2*c)^2 - 16008300*I*cos(2*d*x + 2*c) - 8004150*I
)*cos(4*d*x + 4*c) - 12006225*I*cos(2*d*x + 2*c)^2 + 1334025*(cos(2*d*x + 2
*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*sin(8*d*x + 8*c) + 533
6100*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*sin
(6*d*x + 6*c) + 8004150*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*
d*x + 2*c) + 1)*sin(4*d*x + 4*c) + 5336100*(cos(2*d*x + 2*c)^2 + 2*cos(2*d*
x + 2*c) + 1)*sin(2*d*x + 2*c) - 8004150*I*cos(2*d*x + 2*c) - 1334025*I)*si
n(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)))*d)
```

mupad [B] time = 7.25, size = 293, normalized size = 1.99

$$\frac{a\,\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\,\sqrt{a-\frac{a\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)\,1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,64\mathrm{i}}{5\,d\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)^2}-\frac{a\,\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\,\sqrt{a-\frac{a\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)\,1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,192\mathrm{i}}{7\,d\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)^3}+\frac{a\,\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\,\sqrt{a-\frac{a\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}}{3\,d\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(3/2)/cos(c + d*x)^5,x)
```

```
[Out] (a*exp(- c*1i - d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i
+ d*x*2i) + 1))^(1/2)*64i)/(5*d*(exp(c*2i + d*x*2i) + 1)^2) - (a*exp(- c*1i
 - d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1
))^(1/2)*192i)/(7*d*(exp(c*2i + d*x*2i) + 1)^3) + (a*exp(- c*1i - d*x*1i)*(
a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*64i
)/(3*d*(exp(c*2i + d*x*2i) + 1)^4) - (a*exp(- c*1i - d*x*1i)*(a - (a*(exp(c
*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*64i)/(11*d*(exp(
c*2i + d*x*2i) + 1)^5)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(ia\left(\tan\left(c+dx\right)-i\right)\right)^{\frac{3}{2}}\sec^{5}\left(c+dx\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**5*(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral((I*a*(tan(c + d*x) - I))**(3/2)*sec(c + d*x)**5, x)
```

3.301 $\int \sec^3(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx$

Optimal. Leaf size=110

$$\frac{64ia^3\sec^3(c+dx)}{105d(a+ia\tan(c+dx))^{3/2}}+\frac{16ia^2\sec^3(c+dx)}{35d\sqrt{a+ia\tan(c+dx)}}+\frac{2ia\sec^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{7d}$$

```
[Out] 16/35*I*a^2*sec(d*x+c)^3/d/(a+I*a*tan(d*x+c))^(1/2)+2/7*I*a*sec(d*x+c)^3*(a
+I*a*tan(d*x+c))^(1/2)/d+64/105*I*a^3*sec(d*x+c)^3/d/(a+I*a*tan(d*x+c))^(3/
2)
```

Rubi [A] time = 0.18, antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3494, 3493}

$$\frac{16ia^2\sec^3(c+dx)}{35d\sqrt{a+ia\tan(c+dx)}}+\frac{64ia^3\sec^3(c+dx)}{105d(a+ia\tan(c+dx))^{3/2}}+\frac{2ia\sec^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{7d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((64*I)/105)*a^3*Sec[c + d*x]^3)/(d*(a + I*a*Tan[c + d*x])^(3/2)) + (((16*
I)/35)*a^2*Sec[c + d*x]^3)/(d*Sqrt[a + I*a*Tan[c + d*x]]) + (((2*I)/7)*a*Se
c[c + d*x]^3*Sqrt[a + I*a*Tan[c + d*x]])/d
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int \sec^3(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx &= \frac{2ia\sec^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{7d}+\frac{1}{7}(8a)\int \sec^3(c+dx)\sqrt{a+}\\ &= \frac{16ia^2\sec^3(c+dx)}{35d\sqrt{a+ia\tan(c+dx)}}+\frac{2ia\sec^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{7d}+\\ &= \frac{64ia^3\sec^3(c+dx)}{105d(a+ia\tan(c+dx))^{3/2}}+\frac{16ia^2\sec^3(c+dx)}{35d\sqrt{a+ia\tan(c+dx)}}+\frac{2ia\sec^3(c}{}\end{aligned}$$

Mathematica [A] time = 0.51, size = 91, normalized size = 0.83

$$\frac{2a\sec^3(c+dx)(\cos(dx)-i\sin(dx))\sqrt{a+ia\tan(c+dx)}\,(27i\sin(2(c+dx))+43\cos(2(c+dx))+28)(\sin(2c+}{105d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^3*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (2*a*Sec[c + d*x]^3*(Cos[d*x] - I*Sin[d*x])*(28 + 43*Cos[2*(c + d*x)] + (27
*I)*Sin[2*(c + d*x)])*(I*Cos[2*c + d*x] + Sin[2*c + d*x])*Sqrt[a + I*a*Tan[
c + d*x]])/(105*d)
```

fricas [A] time = 0.71, size = 89, normalized size = 0.81

$$\frac{\sqrt{2}\left(560i\,ae^{(4i\,dx+4i\,c)}+448i\,ae^{(2i\,dx+2i\,c)}+128i\,a\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}}{105\left(de^{(6i\,dx+6i\,c)}+3\,de^{(4i\,dx+4i\,c)}+3\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/105*sqrt(2)*(560*I*a*e^(4*I*d*x + 4*I*c) + 448*I*a*e^(2*I*d*x + 2*I*c) +
128*I*a)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))/(d*e^(6*I*d*x + 6*I*c) + 3*d*e^(
4*I*d*x + 4*I*c) + 3*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(3/2)*sec(d*x + c)^3, x)
```

maple [A] time = 1.12, size = 98, normalized size = 0.89

$$\frac{2\left(64i\left(\cos^{4}(dx+c)\right)+64\left(\cos^{3}(dx+c)\right)\sin(dx+c)-8i\left(\cos^{2}(dx+c)\right)+24\cos(dx+c)\sin(dx+c)+15i\right)\sqrt{}}{105d\cos(dx+c)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] 2/105/d*(64*I*cos(d*x+c)^4+64*cos(d*x+c)^3*sin(d*x+c)-8*I*cos(d*x+c)^2+24*c
os(d*x+c)*sin(d*x+c)+15*I)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/c
os(d*x+c)^3*a
```

maxima [B] time = 1.54, size = 584, normalized size = 5.31

$$-\frac{}{\left(\left(210\cos(2\,dx+2\,c)^{3}+105\,(2\cos(2\,dx+2\,c)+1)\sin(2\,dx+2\,c)^{2}+210i\sin(2\,dx+2\,c)^{3}+105\left(\cos(2\,dx+\right.\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] -(-560*I*sqrt(2)*a*cos(4*d*x + 4*c) - 448*I*sqrt(2)*a*cos(2*d*x + 2*c) + 56
0*sqrt(2)*a*sin(4*d*x + 4*c) + 448*sqrt(2)*a*sin(2*d*x + 2*c) - 128*I*sqrt(
2)*a)*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1
/4)*sqrt(a)/(((210*cos(2*d*x + 2*c)^3 + 105*(2*cos(2*d*x + 2*c) + 1)*sin(2*
d*x + 2*c)^2 + 210*I*sin(2*d*x + 2*c)^3 + 105*(cos(2*d*x + 2*c)^2 + sin(2*d
*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*cos(4*d*x + 4*c) + 525*cos(2*d*x + 2*
c)^2 - (-105*I*cos(2*d*x + 2*c)^2 - 105*I*sin(2*d*x + 2*c)^2 - 210*I*cos(2*
d*x + 2*c) - 105*I)*sin(4*d*x + 4*c) - (-210*I*cos(2*d*x + 2*c)^2 - 420*I*c
```

```
os(2*d*x + 2*c) - 210*I)*sin(2*d*x + 2*c) + 420*cos(2*d*x + 2*c) + 105)*cos
(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - (-210*I*cos(2*d*x +
 2*c)^3 + (-210*I*cos(2*d*x + 2*c) - 105*I)*sin(2*d*x + 2*c)^2 + 210*sin(2*
d*x + 2*c)^3 + (-105*I*cos(2*d*x + 2*c)^2 - 105*I*sin(2*d*x + 2*c)^2 - 210*
I*cos(2*d*x + 2*c) - 105*I)*cos(4*d*x + 4*c) - 525*I*cos(2*d*x + 2*c)^2 + 1
05*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*sin(4
*d*x + 4*c) + 210*(cos(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*sin(2*d*x +
 2*c) - 420*I*cos(2*d*x + 2*c) - 105*I)*sin(3/2*arctan2(sin(2*d*x + 2*c), c
os(2*d*x + 2*c) + 1)))*d)
```

mupad [B] time = 6.02, size = 103, normalized size = 0.94

$$\frac{16\,a\,\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\,\sqrt{a-\frac{a\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)\,1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,28\mathrm{i}+\mathrm{e}^{c\,4\mathrm{i}+d\,x\,4\mathrm{i}}\,35\mathrm{i}+8\mathrm{i}\right)}{105\,d\,{\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(3/2)/cos(c + d*x)^3,x)
```

```
[Out] (16*a*exp(- c*1i - d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*
2i + d*x*2i) + 1))^(1/2)*(exp(c*2i + d*x*2i)*28i + exp(c*4i + d*x*4i)*35i +
 8i))/(105*d*(exp(c*2i + d*x*2i) + 1)^3)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ia\,(\tan{(c+dx)}-i))^{\frac{3}{2}}\sec^3{(c+dx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3*(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral((I*a*(tan(c + d*x) - I))**(3/2)*sec(c + d*x)**3, x)
```

3.302 $\int \sec(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx$

Optimal. Leaf size=69

$$\frac{8ia^2\sec(c+dx)}{3d\sqrt{a+ia\tan(c+dx)}}+\frac{2ia\sec(c+dx)\sqrt{a+ia\tan(c+dx)}}{3d}$$

```
[Out] 8/3*I*a^2*sec(d*x+c)/d/(a+I*a*tan(d*x+c))^(1/2)+2/3*I*a*sec(d*x+c)*(a+I*a*t
an(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.06, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3494, 3493}

$$\frac{8ia^2\sec(c+dx)}{3d\sqrt{a+ia\tan(c+dx)}}+\frac{2ia\sec(c+dx)\sqrt{a+ia\tan(c+dx)}}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((8*I)/3)*a^2*Sec[c + d*x])/(d*Sqrt[a + I*a*Tan[c + d*x]]) + (((2*I)/3)*a*
Sec[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])/d
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int \sec(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx &= \frac{2ia\sec(c+dx)\sqrt{a+ia\tan(c+dx)}}{3d}+\frac{1}{3}(4a)\int \sec(c+dx)\sqrt{a+ia\tan(c+dx)}\\ &= \frac{8ia^2\sec(c+dx)}{3d\sqrt{a+ia\tan(c+dx)}}+\frac{2ia\sec(c+dx)\sqrt{a+ia\tan(c+dx)}}{3d}\end{aligned}$$

Mathematica [A] time = 0.32, size = 57, normalized size = 0.83

$$-\frac{2a(\cos(c)-i\sin(c))(\tan(c+dx)-5i)(\cos(dx)-i\sin(dx))\sqrt{a+ia\tan(c+dx)}}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (-2*a*(Cos[c] - I*Sin[c])*(Cos[d*x] - I*Sin[d*x])*(-5*I + Tan[c + d*x])*Sqr
t[a + I*a*Tan[c + d*x]])/(3*d)
```

fricas [A] time = 0.61, size = 53, normalized size = 0.77

$$\frac{\sqrt{2}\left(12i\,ae^{(2i\,dx+2i\,c)}+8i\,a\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}}{3\left(de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
[Out] 1/3*sqrt(2)*(12*I*a*e^(2*I*d*x + 2*I*c) + 8*I*a)*sqrt(a/(e^(2*I*d*x + 2*I*c
) + 1))/(d*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate((I*a*tan(d*x + c) + a)^(3/2)*sec(d*x + c), x)
```

maple [A] time = 1.02, size = 71, normalized size = 1.03

$$\frac{2\left(4i\left(\cos^2(dx+c)\right)+4\cos(dx+c)\sin(dx+c)+i\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\,a}{3d\cos(dx+c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)*(a+I*a*tan(d*x+c))^(3/2),x)
[Out] 2/3/d*(4*I*cos(d*x+c)^2+4*cos(d*x+c)*sin(d*x+c)+I)*(a*(I*sin(d*x+c)+cos(d*x
+c))/cos(d*x+c))^(1/2)/cos(d*x+c)*a
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{3}{2}}\sec(dx+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate((I*a*tan(d*x + c) + a)^(3/2)*sec(d*x + c), x)
```

mupad [B] time = 4.49, size = 98, normalized size = 1.42

$$\frac{2\,a\,\sqrt{\frac{a\,\left(2\cos(c+d\,x)^2+\sin(2\,c+2\,d\,x)\,1\mathrm{i}\right)}{2\cos(c+d\,x)^2}}\,\left(\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2\,8\mathrm{i}+\cos\left(\frac{3\,c}{2}+\frac{3\,d\,x}{2}\right)^2\,2\mathrm{i}+\sin(c+d\,x)+\sin(3\,c+3\,d\,x)-5\mathrm{i}\right)}{3\,d\cos(c+d\,x)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(3/2)/cos(c + d*x),x)
[Out] (2*a*((a*(sin(2*c + 2*d*x)*1i + 2*cos(c + d*x)^2))/(2*cos(c + d*x)^2))^(1/2
)*(sin(c + d*x) + sin(3*c + 3*d*x) + cos(c/2 + (d*x)/2)^2*8i + cos((3*c)/2
+ (3*d*x)/2)^2*2i - 5i))/(3*d*cos(c + d*x)^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ia (\tan (c+dx)-i))^{\frac{3}{2}} \sec (c+dx)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral((I*a*(tan(c + d*x) - I))**(3/2)*sec(c + d*x), x)
```

3.303 $\int \cos(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx$

Optimal. Leaf size=31

$$-\frac{2ia\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{d}$$

```
[Out] -2*I*a*cos(d*x+c)*(a+I*a*tan(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.05, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.042, Rules used = {3493}

$$-\frac{2ia\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] ((-2*I)*a*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])/d
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rubi steps

$$\int \cos(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx = -\frac{2ia\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{d}$$

Mathematica [A] time = 0.15, size = 31, normalized size = 1.00

$$-\frac{2ia\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] ((-2*I)*a*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])/d
```

fricas [A] time = 0.60, size = 40, normalized size = 1.29

$$\frac{\sqrt{2}\left(-i\,ae^{(2i\,dx+2i\,c)}-i\,a\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] sqrt(2)*(-I*a*e^(2*I*d*x + 2*I*c) - I*a)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))/
d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(3/2)*cos(d*x + c), x)
```

maple [A] time = 1.04, size = 42, normalized size = 1.35

$$-\frac{2i\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\cos(dx+c)\,a}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)*(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] -2*I/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*cos(d*x+c)*a
```

maxima [B] time = 0.86, size = 201, normalized size = 6.48

$$\frac{2\left(i\,a^{\frac{3}{2}}-\frac{2i\,a^{\frac{3}{2}}\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{i\,a^{\frac{3}{2}}\sin(dx+c)^4}{(\cos(dx+c)+1)^4}\right)\left(-\frac{2i\sin(dx+c)}{\cos(dx+c)+1}+\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-1\right)^{\frac{3}{2}}}{d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{3}{2}}\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right)^{\frac{3}{2}}\left(-\frac{2i\sin(dx+c)}{\cos(dx+c)+1}-\frac{2i\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 2*(I*a^(3/2) - 2*I*a^(3/2)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + I*a^(3/2)*
sin(d*x + c)^4/(cos(d*x + c) + 1)^4)*(-2*I*sin(d*x + c)/(cos(d*x + c) + 1)
+ sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 1)^(3/2)/(d*(sin(d*x + c)/(cos(d*x
+ c) + 1) + 1)^(3/2)*(sin(d*x + c)/(cos(d*x + c) + 1) - 1)^(3/2)*(-2*I*sin(
d*x + c)/(cos(d*x + c) + 1) - 2*I*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + sin
(d*x + c)^4/(cos(d*x + c) + 1)^4 - 1))
```

mupad [B] time = 0.23, size = 60, normalized size = 1.94

$$-\frac{a\left(2\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2-1\right)\sqrt{\frac{a\left(2\cos(c+d\,x)^2+\sin(2\,c+2\,d\,x)\,1\mathrm{i}\right)}{2\cos(c+d\,x)^2}}\;2\mathrm{i}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^(3/2),x)
```

```
[Out] -(a*(2*cos(c/2 + (d*x)/2)^2 - 1)*((a*(sin(2*c + 2*d*x)*1i + 2*cos(c + d*x)^
2))/(2*cos(c + d*x)^2))^(1/2)*2i)/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ia\,(\tan(c+dx)-i))^{\frac{3}{2}}\cos(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral((I*a*(tan(c + d*x) - I))**(3/2)*cos(c + d*x), x)
```

3.304 $\int \cos^3(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx$

Optimal. Leaf size=122

$$\frac{ia^{3/2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{2\sqrt{2}d}-\frac{i\cos^3(c+dx)(a+ia\tan(c+dx))^{3/2}}{3d}-\frac{ia\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{2d}$$

```
[Out] 1/4*I*a^(3/2)*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/
2))/d*2^(1/2)-1/2*I*a*cos(d*x+c)*(a+I*a*tan(d*x+c))^(1/2)/d-1/3*I*cos(d*x+c
)^3*(a+I*a*tan(d*x+c))^(3/2)/d
```

Rubi [A] time = 0.15, antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.115, Rules used = {3490, 3489, 206}

$$\frac{ia^{3/2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{2\sqrt{2}d}-\frac{i\cos^3(c+dx)(a+ia\tan(c+dx))^{3/2}}{3d}-\frac{ia\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] ((I/2)*a^(3/2)*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[c +
 d*x]])])/(Sqrt[2]*d) - ((I/2)*a*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])/d
 - ((I/3)*Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^(3/2))/d
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3490

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] + Dist[a/(2*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b*Tan[e +
f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] &&
EqQ[m/2 + n, 0] && GtQ[n, 0]
```

Rubi steps

$$\int \cos^3(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx = -\frac{i\cos^3(c+dx)(a+ia\tan(c+dx))^{3/2}}{3d} + \frac{1}{2}a\int \cos(c+dx)\sqrt{a+ia\tan}$$
$$= -\frac{ia\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{2d} - \frac{i\cos^3(c+dx)(a+ia\tan(c+dx}{3d}$$
$$= -\frac{ia\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{2d} - \frac{i\cos^3(c+dx)(a+ia\tan(c+dx}{3d}$$
$$= \frac{ia^{3/2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{2\sqrt{2}d} - \frac{ia\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{2d} -$$

Mathematica [A] time = 0.96, size = 101, normalized size = 0.83

$$-\frac{iae^{-i(c+dx)}\left(5e^{2i(c+dx)}+e^{4i(c+dx)}-3\sqrt{1+e^{2i(c+dx)}}\tanh^{-1}\left(\sqrt{1+e^{2i(c+dx)}}\right)+4\right)\sqrt{a+ia\tan(c+dx)}}{12d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] ((-1/12*I)*a*(4 + 5*E^((2*I)*(c + d*x)) + E^((4*I)*(c + d*x)) - 3*Sqrt[1 +
E^((2*I)*(c + d*x))]*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]])*Sqrt[a + I*a*T
an[c + d*x]])/(d*E^(I*(c + d*x)))
```

fricas [B] time = 0.64, size = 222, normalized size = 1.82

$$\frac{3\sqrt{\frac{1}{2}}\sqrt{-\frac{a^3}{d^2}}\,d\log\left(\frac{\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(de^{(2i\,dx+2i\,c)}+d\right)\sqrt{-\frac{a^3}{d^2}}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}+i\,a^2\right)e^{(-i\,dx-i\,c)}}{d}\right)-3\sqrt{\frac{1}{2}}\sqrt{-\frac{a^3}{d^2}}\,d\log\left(-\frac{\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(de^{(2i\,dx+2i\,c)}+d\right)\sqrt{-}\right.}{}\right.}{12\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/12*(3*sqrt(1/2)*sqrt(-a^3/d^2)*d*log((sqrt(2)*sqrt(1/2)*(d*e^(2*I*d*x + 2
*I*c) + d)*sqrt(-a^3/d^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)) + I*a^2)*e^(-I*
d*x - I*c)/d) - 3*sqrt(1/2)*sqrt(-a^3/d^2)*d*log(-(sqrt(2)*sqrt(1/2)*(d*e^(
2*I*d*x + 2*I*c) + d)*sqrt(-a^3/d^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)) - I*
a^2)*e^(-I*d*x - I*c)/d) + sqrt(2)*(-I*a*e^(4*I*d*x + 4*I*c) - 5*I*a*e^(2*I
*d*x + 2*I*c) - 4*I*a)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(3/2)*cos(d*x + c)^3, x)
```

maple [B] time = 1.39, size = 570, normalized size = 4.67

$$-\frac{\left(3i\sqrt{2}\,\left(\cos^2(dx+c)\right)\sin(dx+c)\left(-\frac{2\cos(dx+c)}{1+\cos(dx+c)}\right)^{\frac{5}{2}}\operatorname{arctanh}\left(\frac{\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\,\sin(dx+c)\sqrt{2}}{2\cos(dx+c)}\right)-3\left(\cos^2(dx+c)\right)\sin(dx\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] -1/48/d*(3*I*2^(1/2)*cos(d*x+c)^2*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))
^(5/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+
c)*2^(1/2))-3*cos(d*x+c)^2*sin(d*x+c)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(5/2)*2^(1/2)+6*I*2^(1/2
)*cos(d*x+c)*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(5/2)*arctanh(1/2*(-
2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))-6*cos(d*x
+c)*sin(d*x+c)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2
*cos(d*x+c)/(1+cos(d*x+c)))^(5/2)*2^(1/2)+3*I*2^(1/2)*arctanh(1/2*(-2*cos(d
*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(
1+cos(d*x+c)))^(5/2)*sin(d*x+c)-3*2^(1/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(
d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(5/2)*sin(d*x+c)+32*
I*cos(d*x+c)^6-16*I*cos(d*x+c)^5-32*cos(d*x+c)^5*sin(d*x+c)+8*I*cos(d*x+c)^
4+16*sin(d*x+c)*cos(d*x+c)^4-24*I*cos(d*x+c)^3-24*cos(d*x+c)^3*sin(d*x+c))*
(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/(I*sin(d*x+c)+cos(d*x+c)-1)/
cos(d*x+c)^2*a
```

maxima [B] time = 0.67, size = 883, normalized size = 7.24

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] -1/48*(4*(I*sqrt(2)*a*cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) +
1)) - sqrt(2)*a*sin(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)))*(
cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(3/4)*sqr
t(a) + 12*(I*sqrt(2)*a*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) +
 1)) - sqrt(2)*a*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)))*
(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sq
rt(a) + (6*sqrt(2)*a*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*c
os(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*
c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1
)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1) - 6*s
qrt(2)*a*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2
*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (c
os(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(
1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 1) - 3*I*sqrt(2)*a*l
og(sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*c
os(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + sqrt(cos(2*d*x
+ 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*sin(1/2*arctan2(sin
(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + 2*(cos(2*d*x + 2*c)^2 + sin(2*d*x
 + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c) + 1)) + 1) + 3*I*sqrt(2)*a*log(sqrt(cos(2*d*x + 2*c)^2 +
sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*
c), cos(2*d*x + 2*c) + 1))^2 + sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2
 + 2*cos(2*d*x + 2*c) + 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*
c) + 1))^2 - 2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c
) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1))
*sqrt(a))/d
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \cos(c+d\,x)^3\,(a+a\tan(c+d\,x)\,1\mathrm{i})^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^(3/2),x)
```

```
[Out] int(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3*(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

3.305 $\int \cos^5(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx$

Optimal. Leaf size=192

$$\frac{7ia^{3/2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{16\sqrt{2}\,d}+\frac{7ia^2\cos(c+dx)}{24d\sqrt{a+ia\tan(c+dx)}}-\frac{i\cos^5(c+dx)(a+ia\tan(c+dx))^{3/2}}{5d}-\frac{7ia\cos^3(c+$$

```
[Out] 7/32*I*a^(3/2)*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1
/2))/d*2^(1/2)+7/24*I*a^2*cos(d*x+c)/d/(a+I*a*tan(d*x+c))^(1/2)-7/16*I*a*co
s(d*x+c)*(a+I*a*tan(d*x+c))^(1/2)/d-7/30*I*a*cos(d*x+c)^3*(a+I*a*tan(d*x+c)
)^(1/2)/d-1/5*I*cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(3/2)/d
```

Rubi [A] time = 0.27, antiderivative size = 192, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {3497, 3502, 3490, 3489, 206}

$$\frac{7ia^2\cos(c+dx)}{24d\sqrt{a+ia\tan(c+dx)}}+\frac{7ia^{3/2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{16\sqrt{2}\,d}-\frac{i\cos^5(c+dx)(a+ia\tan(c+dx))^{3/2}}{5d}-\frac{7ia\cos^3(c+$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((7*I)/16)*a^(3/2)*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Ta
n[c + d*x]])])/(Sqrt[2]*d) + (((7*I)/24)*a^2*Cos[c + d*x])/(d*Sqrt[a + I*a*
Tan[c + d*x]]) - (((7*I)/16)*a*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])/d -
 (((7*I)/30)*a*Cos[c + d*x]^3*Sqrt[a + I*a*Tan[c + d*x]])/d - ((I/5)*Cos[c
+ d*x]^5*(a + I*a*Tan[c + d*x])^(3/2))/d
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3490

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] + Dist[a/(2*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b*Tan[e +
f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] &&
EqQ[m/2 + n, 0] && GtQ[n, 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \cos^5(c+dx)(a+ia\tan(c+dx))^{3/2}\,dx = -\frac{i\cos^5(c+dx)(a+ia\tan(c+dx))^{3/2}}{5d}+\frac{1}{10}(7a)\int \cos^3(c+dx)\sqrt{a+i}$$

$$= -\frac{7ia\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{30d}-\frac{i\cos^5(c+dx)(a+ia\tan(c+}{5d}$$

$$= \frac{7ia^2\cos(c+dx)}{24d\sqrt{a+ia\tan(c+dx)}}-\frac{7ia\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{30d}-\frac{i\,co}{}$$

$$= \frac{7ia^2\cos(c+dx)}{24d\sqrt{a+ia\tan(c+dx)}}-\frac{7ia\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{16d}-\frac{7ia\,c}{}$$

$$= \frac{7ia^2\cos(c+dx)}{24d\sqrt{a+ia\tan(c+dx)}}-\frac{7ia\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{16d}-\frac{7ia\,c}{}$$

$$= \frac{7ia^{3/2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{16\sqrt{2}\,d}+\frac{7ia^2\cos(c+dx)}{24d\sqrt{a+ia\tan(c+dx)}}-\frac{7ia\cos}{}$$

Mathematica [A] time = 1.50, size = 160, normalized size = 0.83

$$-\frac{iae^{-3i(c+dx)}\sqrt{\frac{ae^{2i(c+dx)}}{1+e^{2i(c+dx)}}}\left(101e^{2i(c+dx)}+148e^{4i(c+dx)}+38e^{6i(c+dx)}+6e^{8i(c+dx)}-105e^{2i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\tanh^{-1}\left(\sqrt{\right.\right.}}{240\sqrt{2}\,d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] ((-1/240*I)*a*Sqrt[(a*E^((2*I)*(c + d*x)))/(1 + E^((2*I)*(c + d*x)))]*(-15
+ 101*E^((2*I)*(c + d*x)) + 148*E^((4*I)*(c + d*x)) + 38*E^((6*I)*(c + d*x)
) + 6*E^((8*I)*(c + d*x)) - 105*E^((2*I)*(c + d*x))*Sqrt[1 + E^((2*I)*(c +
d*x))]*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]]))/(Sqrt[2]*d*E^((3*I)*(c + d*
x)))
```

fricas [A] time = 0.50, size = 274, normalized size = 1.43

$$\left(105\sqrt{\frac{1}{2}}\sqrt{-\frac{a^3}{d^2}}\,de^{(2i\,dx+2i\,c)}\log\left(\frac{7\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(de^{(2i\,dx+2i\,c)}+d\right)\sqrt{-\frac{a^3}{d^2}}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}+i\,a^2\right)e^{(-i\,dx-i\,c)}}{8\,d}\right)-105\sqrt{\frac{1}{2}}\sqrt{-\frac{a^3}{d^2}}\,de^{(2i\,dx+2i\,c)}\log\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/480*(105*sqrt(1/2)*sqrt(-a^3/d^2)*d*e^(2*I*d*x + 2*I*c)*log(7/8*(sqrt(2)*
sqrt(1/2)*(d*e^(2*I*d*x + 2*I*c) + d)*sqrt(-a^3/d^2)*sqrt(a/(e^(2*I*d*x + 2
*I*c) + 1)) + I*a^2)*e^(-I*d*x - I*c)/d) - 105*sqrt(1/2)*sqrt(-a^3/d^2)*d*e
^(2*I*d*x + 2*I*c)*log(-7/8*(sqrt(2)*sqrt(1/2)*(d*e^(2*I*d*x + 2*I*c) + d)*
```

```
sqrt(-a^3/d^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)) - I*a^2)*e^(-I*d*x - I*c)/
d) + sqrt(2)*(-6*I*a*e^(8*I*d*x + 8*I*c) - 38*I*a*e^(6*I*d*x + 6*I*c) - 148
*I*a*e^(4*I*d*x + 4*I*c) - 101*I*a*e^(2*I*d*x + 2*I*c) + 15*I*a)*sqrt(a/(e^
(2*I*d*x + 2*I*c) + 1)))*e^(-2*I*d*x - 2*I*c)/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{3}{2}}\cos(dx+c)^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
[Out] integrate((I*a*tan(d*x + c) + a)^(3/2)*cos(d*x + c)^5, x)
```

maple [B] time = 1.42, size = 914, normalized size = 4.76

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(3/2),x)
[Out] -1/7680/d*(448*I*cos(d*x+c)^7+1120*I*cos(d*x+c)^6-105*cos(d*x+c)^4*sin(d*x+
c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(9/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*
x+c)))^(1/2)*2^(1/2))*2^(1/2)+105*I*cos(d*x+c)^4*sin(d*x+c)*2^(1/2)*(-2*cos
(d*x+c)/(1+cos(d*x+c)))^(9/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))-420*cos(d*x+c)^3*sin(d*x+c)*(-2*cos(d*x+
c)/(1+cos(d*x+c)))^(9/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^
(1/2))*2^(1/2)-3360*I*cos(d*x+c)^5-630*cos(d*x+c)^2*sin(d*x+c)*(-2*cos(d*x+
c)/(1+cos(d*x+c)))^(9/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^
(1/2))*2^(1/2)+420*I*cos(d*x+c)*sin(d*x+c)*2^(1/2)*(-2*cos(d*x+c)/(1+cos(d*
x+c)))^(9/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/co
s(d*x+c)*2^(1/2))-420*cos(d*x+c)*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^
(9/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)-105*
arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+
cos(d*x+c)))^(9/2)*2^(1/2)*sin(d*x+c)+420*I*cos(d*x+c)^3*sin(d*x+c)*2^(1/2)
*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(9/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x
+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))+630*I*cos(d*x+c)^2*sin(d*x+c)*2^
(1/2)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(9/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))-3072*sin(d*x+c)*cos(d*x+c)^
9+256*I*cos(d*x+c)^8+1536*sin(d*x+c)*cos(d*x+c)^8+3072*I*cos(d*x+c)^10-1792
*sin(d*x+c)*cos(d*x+c)^7+105*I*2^(1/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*
x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^
(9/2)*sin(d*x+c)+2240*sin(d*x+c)*cos(d*x+c)^6-1536*I*cos(d*x+c)^9-3360*cos(
d*x+c)^5*sin(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/(I*sin(
d*x+c)+cos(d*x+c)-1)/cos(d*x+c)^4*a
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \cos(c+d\,x)^5\,(a+a\tan(c+d\,x)\,1\mathrm{i})^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^(3/2),x)
```

```
[Out] int(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**5*(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

3.306 $\int \sec^8(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx$

Optimal. Leaf size=117

$$\frac{2i(a+ia\tan(c+dx))^{19/2}}{19a^7d}-\frac{12i(a+ia\tan(c+dx))^{17/2}}{17a^6d}+\frac{8i(a+ia\tan(c+dx))^{15/2}}{5a^5d}-\frac{16i(a+ia\tan(c+dx))^{13/2}}{13a^4d}$$

```
[Out] -16/13*I*(a+I*a*tan(d*x+c))^(13/2)/a^4/d+8/5*I*(a+I*a*tan(d*x+c))^(15/2)/a^
5/d-12/17*I*(a+I*a*tan(d*x+c))^(17/2)/a^6/d+2/19*I*(a+I*a*tan(d*x+c))^(19/2
)/a^7/d
```

Rubi [A] time = 0.09, antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 43}

$$\frac{2i(a+ia\tan(c+dx))^{19/2}}{19a^7d}-\frac{12i(a+ia\tan(c+dx))^{17/2}}{17a^6d}+\frac{8i(a+ia\tan(c+dx))^{15/2}}{5a^5d}-\frac{16i(a+ia\tan(c+dx))^{13/2}}{13a^4d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^8*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((-16*I)/13)*(a + I*a*Tan[c + d*x])^(13/2))/(a^4*d) + (((8*I)/5)*(a + I*a*
Tan[c + d*x])^(15/2))/(a^5*d) - (((12*I)/17)*(a + I*a*Tan[c + d*x])^(17/2))
/(a^6*d) + (((2*I)/19)*(a + I*a*Tan[c + d*x])^(19/2))/(a^7*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^8(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^3(a+x)^{11/2}\,dx,x,ia\tan(c+dx)\right)}{a^7d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(8a^3(a+x)^{11/2}-12a^2(a+x)^{13/2}+6a(a+x)^{15/2}-(a+\right.\right.}{a^7d}\\ &= -\frac{16i(a+ia\tan(c+dx))^{13/2}}{13a^4d}+\frac{8i(a+ia\tan(c+dx))^{15/2}}{5a^5d}-\frac{12i(a+}{}\end{aligned}$$

Mathematica [A] time = 1.45, size = 113, normalized size = 0.97

$$-\frac{2a^2\sec^8(c+dx)\sqrt{a+ia\tan(c+dx)}\,(\cos(6c+8dx)+i\sin(6c+8dx))(3262i\cos(2(c+dx))+494\tan(c+dx}{20995d(\cos(dx)+i\sin(dx))^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^8*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (-2*a^2*Sec[c + d*x]^8*(Cos[6*c + 8*d*x] + I*Sin[6*c + 8*d*x])*(-833*I + (3
262*I)*Cos[2*(c + d*x)] + 1599*Sec[c + d*x]*Sin[3*(c + d*x)] + 494*Tan[c +
d*x])*Sqrt[a + I*a*Tan[c + d*x]])/(20995*d*(Cos[d*x] + I*Sin[d*x])^2)
```

fricas [B] time = 0.66, size = 190, normalized size = 1.62

$$\frac{\sqrt{2}\left(-16384i\,a^2e^{(19i\,dx+19i\,c)}-155648i\,a^2e^{(17i\,dx+17i\,c)}-661504i\,a^2e^{(15i\,dx+15i\,c)}-1653760i\,a\right.}{20995\left(de^{(18i\,dx+18i\,c)}+9\,de^{(16i\,dx+16i\,c)}+36\,de^{(14i\,dx+14i\,c)}+84\,de^{(12i\,dx+12i\,c)}+126\,de^{(10i\,dx+10i\,c)}+126\,de^{(8i\,dx+8i\,c)}+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/20995*sqrt(2)*(-16384*I*a^2*e^(19*I*d*x + 19*I*c) - 155648*I*a^2*e^(17*I*
d*x + 17*I*c) - 661504*I*a^2*e^(15*I*d*x + 15*I*c) - 1653760*I*a^2*e^(13*I*
d*x + 13*I*c))*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))/(d*e^(18*I*d*x + 18*I*c) +
 9*d*e^(16*I*d*x + 16*I*c) + 36*d*e^(14*I*d*x + 14*I*c) + 84*d*e^(12*I*d*x
+ 12*I*c) + 126*d*e^(10*I*d*x + 10*I*c) + 126*d*e^(8*I*d*x + 8*I*c) + 84*d*
e^(6*I*d*x + 6*I*c) + 36*d*e^(4*I*d*x + 4*I*c) + 9*d*e^(2*I*d*x + 2*I*c) +
d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^8\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(5/2)*sec(d*x + c)^8, x)
```

maple [A] time = 18.98, size = 171, normalized size = 1.46

$$-\frac{2\left(4096i\left(\cos^9(dx+c)\right)-4096\sin(dx+c)\left(\cos^8(dx+c)\right)+512i\left(\cos^7(dx+c)\right)-2560\sin(dx+c)\left(\cos^6(dx+\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] -2/20995/d*(4096*I*cos(d*x+c)^9-4096*sin(d*x+c)*cos(d*x+c)^8+512*I*cos(d*x+
c)^7-2560*sin(d*x+c)*cos(d*x+c)^6+224*I*cos(d*x+c)^5-2016*sin(d*x+c)*cos(d*
x+c)^4+132*I*cos(d*x+c)^3-1716*cos(d*x+c)^2*sin(d*x+c)-2535*I*cos(d*x+c)+11
05*sin(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^9*
a^2
```

maxima [A] time = 0.44, size = 76, normalized size = 0.65

$$\frac{2i\left(1105\,(i\,a\tan(dx+c)+a)^{\frac{19}{2}}-7410\,(i\,a\tan(dx+c)+a)^{\frac{17}{2}}a+16796\,(i\,a\tan(dx+c)+a)^{\frac{15}{2}}a^2-12920\,(i\,a\tan\right.}{20995\,a^7d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] 2/20995*I*(1105*(I*a*tan(d*x + c) + a)^(19/2) - 7410*(I*a*tan(d*x + c) + a)
^(17/2)*a + 16796*(I*a*tan(d*x + c) + a)^(15/2)*a^2 - 12920*(I*a*tan(d*x +
c) + a)^(13/2)*a^3)/(a^7*d)
```

mupad [B] time = 15.90, size = 626, normalized size = 5.35

$$-\frac{a^2\,\sqrt{a-\frac{a\,\left({\mathrm{e}}^{c\,2{}\mathrm{i}+d\,x\,2{}\mathrm{i}}\,1{}\mathrm{i}-\mathrm{i}\right)\,1{}\mathrm{i}}{{\mathrm{e}}^{c\,2{}\mathrm{i}+d\,x\,2{}\mathrm{i}}+1}}\,16384{}\mathrm{i}}{20995\,d}-\frac{a^2\,\sqrt{a-\frac{a\,\left({\mathrm{e}}^{c\,2{}\mathrm{i}+d\,x\,2{}\mathrm{i}}\,1{}\mathrm{i}-\mathrm{i}\right)\,1{}\mathrm{i}}{{\mathrm{e}}^{c\,2{}\mathrm{i}+d\,x\,2{}\mathrm{i}}+1}}\,8192{}\mathrm{i}}{20995\,d\,\left({\mathrm{e}}^{c\,2{}\mathrm{i}+d\,x\,2{}\mathrm{i}}+1\right)}-\frac{a^2\,\sqrt{a-\frac{a\,\left({\mathrm{e}}^{c\,2{}\mathrm{i}+d\,x\,2{}\mathrm{i}}\,1{}\mathrm{i}-\mathrm{i}\right)\,1{}\mathrm{i}}{{\mathrm{e}}^{c\,2{}\mathrm{i}+d\,x\,2{}\mathrm{i}}+1}}\,6144{}\mathrm{i}}{20995\,d\,{\left({\mathrm{e}}^{c\,2{}\mathrm{i}+d\,x\,2{}\mathrm{i}}+1\right)}^2}-\frac{a^2\,\sqrt{a-}}{4199}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(5/2)/cos(c + d*x)^8,x)
```

```
[Out] (a^2*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/
2)*536576i)/(4199*d*(exp(c*2i + d*x*2i) + 1)^4) - (a^2*(a - (a*(exp(c*2i +
d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*8192i)/(20995*d*(exp(c
*2i + d*x*2i) + 1)) - (a^2*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*
2i + d*x*2i) + 1))^(1/2)*6144i)/(20995*d*(exp(c*2i + d*x*2i) + 1)^2) - (a^2
*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*1
024i)/(4199*d*(exp(c*2i + d*x*2i) + 1)^3) - (a^2*(a - (a*(exp(c*2i + d*x*2i
)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*16384i)/(20995*d) - (a^2*(a
- (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*10484
736i)/(20995*d*(exp(c*2i + d*x*2i) + 1)^5) + (a^2*(a - (a*(exp(c*2i + d*x*2
i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*17262592i)/(20995*d*(exp(c*
2i + d*x*2i) + 1)^6) - (a^2*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c
*2i + d*x*2i) + 1))^(1/2)*1129472i)/(1615*d*(exp(c*2i + d*x*2i) + 1)^7) + (
a^2*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2
)*98304i)/(323*d*(exp(c*2i + d*x*2i) + 1)^8) - (a^2*(a - (a*(exp(c*2i + d*x
*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*1024i)/(19*d*(exp(c*2i +
d*x*2i) + 1)^9)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8*(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.307 $\int \sec^6(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx$

Optimal. Leaf size=88

$$-\frac{2i(a+ia\tan(c+dx))^{15/2}}{15a^5d}+\frac{8i(a+ia\tan(c+dx))^{13/2}}{13a^4d}-\frac{8i(a+ia\tan(c+dx))^{11/2}}{11a^3d}$$

```
[Out] -8/11*I*(a+I*a*tan(d*x+c))^(11/2)/a^3/d+8/13*I*(a+I*a*tan(d*x+c))^(13/2)/a^
4/d-2/15*I*(a+I*a*tan(d*x+c))^(15/2)/a^5/d
```

Rubi [A] time = 0.08, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 43}

$$-\frac{2i(a+ia\tan(c+dx))^{15/2}}{15a^5d}+\frac{8i(a+ia\tan(c+dx))^{13/2}}{13a^4d}-\frac{8i(a+ia\tan(c+dx))^{11/2}}{11a^3d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((-8*I)/11)*(a + I*a*Tan[c + d*x])^(11/2))/(a^3*d) + (((8*I)/13)*(a + I*a*
Tan[c + d*x])^(13/2))/(a^4*d) - (((2*I)/15)*(a + I*a*Tan[c + d*x])^(15/2))/
(a^5*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^6(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^2(a+x)^{9/2}\,dx,x,ia\tan(c+dx)\right)}{a^5d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(4a^2(a+x)^{9/2}-4a(a+x)^{11/2}+(a+x)^{13/2}\right)dx,x,ia\tan(c\right.}{a^5d}\\ &= -\frac{8i(a+ia\tan(c+dx))^{11/2}}{11a^3d}+\frac{8i(a+ia\tan(c+dx))^{13/2}}{13a^4d}-\frac{2i(a+ia\tan}{15a}\end{aligned}$$

Mathematica [A] time = 0.79, size = 97, normalized size = 1.10

$$\frac{2a^2\sec^7(c+dx)\sqrt{a+ia\tan(c+dx)}\,(-187i\sin(2(c+dx))+203\cos(2(c+dx))+60)(\sin(5c+7dx)-i\cos(5c+}{2145d(\cos(dx)+i\sin(dx))^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (2*a^2*Sec[c + d*x]^7*(60 + 203*Cos[2*(c + d*x)] - (187*I)*Sin[2*(c + d*x)]
)*((-I)*Cos[5*c + 7*d*x] + Sin[5*c + 7*d*x])*Sqrt[a + I*a*Tan[c + d*x]])/(2
145*d*(Cos[d*x] + I*Sin[d*x])^2)
```

fricas [B] time = 0.68, size = 152, normalized size = 1.73

$$\frac{\sqrt{2}\left(-2048i\,a^2e^{(15i\,dx+15i\,c)}-15360i\,a^2e^{(13i\,dx+13i\,c)}-49920i\,a^2e^{(11i\,dx+11i\,c)}\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}}{2145\left(de^{(14i\,dx+14i\,c)}+7\,de^{(12i\,dx+12i\,c)}+21\,de^{(10i\,dx+10i\,c)}+35\,de^{(8i\,dx+8i\,c)}+35\,de^{(6i\,dx+6i\,c)}+21\,de^{(4i\,dx+4i\,c)}+7\,de\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/2145*sqrt(2)*(-2048*I*a^2*e^(15*I*d*x + 15*I*c) - 15360*I*a^2*e^(13*I*d*x
 + 13*I*c) - 49920*I*a^2*e^(11*I*d*x + 11*I*c))*sqrt(a/(e^(2*I*d*x + 2*I*c)
 + 1))/(d*e^(14*I*d*x + 14*I*c) + 7*d*e^(12*I*d*x + 12*I*c) + 21*d*e^(10*I*
d*x + 10*I*c) + 35*d*e^(8*I*d*x + 8*I*c) + 35*d*e^(6*I*d*x + 6*I*c) + 21*d*
e^(4*I*d*x + 4*I*c) + 7*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^6\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(5/2)*sec(d*x + c)^6, x)
```

maple [B] time = 2.82, size = 144, normalized size = 1.64

$$-\frac{2\left(512i\left(\cos^7(dx+c)\right)-512\sin(dx+c)\left(\cos^6(dx+c)\right)+64i\left(\cos^5(dx+c)\right)-320\sin(dx+c)\left(\cos^4(dx+\right.\right.}{214}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] -2/2145/d*(512*I*cos(d*x+c)^7-512*sin(d*x+c)*cos(d*x+c)^6+64*I*cos(d*x+c)^5
-320*sin(d*x+c)*cos(d*x+c)^4+28*I*cos(d*x+c)^3-252*cos(d*x+c)^2*sin(d*x+c)-
341*I*cos(d*x+c)+143*sin(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(
1/2)/cos(d*x+c)^7*a^2
```

maxima [A] time = 0.45, size = 58, normalized size = 0.66

$$-\frac{2i\left(143\,(i\,a\tan(dx+c)+a)^{\frac{15}{2}}-660\,(i\,a\tan(dx+c)+a)^{\frac{13}{2}}a+780\,(i\,a\tan(dx+c)+a)^{\frac{11}{2}}a^2\right)}{2145\,a^5d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] -2/2145*I*(143*(I*a*tan(d*x + c) + a)^(15/2) - 660*(I*a*tan(d*x + c) + a)^(
13/2)*a + 780*(I*a*tan(d*x + c) + a)^(11/2)*a^2)/(a^5*d)
```

mupad [B] time = 11.32, size = 498, normalized size = 5.66

$$-\frac{a^2\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,2048i}{2145\,d}-\frac{a^2\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,1024i}{2145\,d\left(e^{c\,2i+d\,x\,2i}+1\right)}-\frac{a^2\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,256i}{715\,d\left(e^{c\,2i+d\,x\,2i}+1\right)^2}+\frac{a^2\sqrt{a-\frac{a\,(}{}}}{429\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(5/2)/cos(c + d*x)^6,x)
```

```
[Out] (a^2*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/
2)*18176i)/(429*d*(exp(c*2i + d*x*2i) + 1)^3) - (a^2*(a - (a*(exp(c*2i + d*
x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*1024i)/(2145*d*(exp(c*2i
 + d*x*2i) + 1)) - (a^2*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i
+ d*x*2i) + 1))^(1/2)*256i)/(715*d*(exp(c*2i + d*x*2i) + 1)^2) - (a^2*(a -
(a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*2048i)/
(2145*d) - (a^2*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i
) + 1))^(1/2)*52736i)/(429*d*(exp(c*2i + d*x*2i) + 1)^4) + (a^2*(a - (a*(ex
p(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*103936i)/(715
*d*(exp(c*2i + d*x*2i) + 1)^5) - (a^2*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*
1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*15616i)/(195*d*(exp(c*2i + d*x*2i) + 1)
^6) + (a^2*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1
))^(1/2)*256i)/(15*d*(exp(c*2i + d*x*2i) + 1)^7)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6*(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.308 $\int \sec^4(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx$

Optimal. Leaf size=59

$$\frac{2i(a+ia\tan(c+dx))^{11/2}}{11a^3d}-\frac{4i(a+ia\tan(c+dx))^{9/2}}{9a^2d}$$

```
[Out] -4/9*I*(a+I*a*tan(d*x+c))^(9/2)/a^2/d+2/11*I*(a+I*a*tan(d*x+c))^(11/2)/a^3/
d
```

Rubi [A] time = 0.07, antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 43}

$$\frac{2i(a+ia\tan(c+dx))^{11/2}}{11a^3d}-\frac{4i(a+ia\tan(c+dx))^{9/2}}{9a^2d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((-4*I)/9)*(a + I*a*Tan[c + d*x])^(9/2))/(a^2*d) + (((2*I)/11)*(a + I*a*Ta
n[c + d*x])^(11/2))/(a^3*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^4(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)(a+x)^{7/2}\,dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(2a(a+x)^{7/2}-(a+x)^{9/2}\right)\,dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{4i(a+ia\tan(c+dx))^{9/2}}{9a^2d}+\frac{2i(a+ia\tan(c+dx))^{11/2}}{11a^3d}\end{aligned}$$

Mathematica [A] time = 0.59, size = 85, normalized size = 1.44

$$-\frac{2a^2(9\tan(c+dx)+13i)\sec^4(c+dx)\sqrt{a+ia\tan(c+dx)}\,(\cos(4c+6dx)+i\sin(4c+6dx))}{99d(\cos(dx)+i\sin(dx))^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (-2*a^2*Sec[c + d*x]^4*(Cos[4*c + 6*d*x] + I*Sin[4*c + 6*d*x])*(13*I + 9*Ta
n[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])/(99*d*(Cos[d*x] + I*Sin[d*x])^2)
```

fricas [B] time = 0.46, size = 114, normalized size = 1.93

$$\frac{\sqrt{2}\left(-128i\,a^2e^{(11i\,dx+11i\,c)}-704i\,a^2e^{(9i\,dx+9i\,c)}\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}}{99\left(de^{(10i\,dx+10i\,c)}+5\,de^{(8i\,dx+8i\,c)}+10\,de^{(6i\,dx+6i\,c)}+10\,de^{(4i\,dx+4i\,c)}+5\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/99*sqrt(2)*(-128*I*a^2*e^(11*I*d*x + 11*I*c) - 704*I*a^2*e^(9*I*d*x + 9*I
*c))*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))/(d*e^(10*I*d*x + 10*I*c) + 5*d*e^(8*
I*d*x + 8*I*c) + 10*d*e^(6*I*d*x + 6*I*c) + 10*d*e^(4*I*d*x + 4*I*c) + 5*d*
e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int(i\,a\tan(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(5/2)*sec(d*x + c)^4, x)
```

maple [B] time = 1.30, size = 117, normalized size = 1.98

$$\frac{2\left(-32i\left(\cos^5(dx+c)\right)+32\sin(dx+c)\left(\cos^4(dx+c)\right)-4i\left(\cos^3(dx+c)\right)+20\left(\cos^2(dx+c)\right)\sin(dx+c)+23\right.}{99d\cos(dx+c)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 2/99/d*(-32*I*cos(d*x+c)^5+32*sin(d*x+c)*cos(d*x+c)^4-4*I*cos(d*x+c)^3+20*c
os(d*x+c)^2*sin(d*x+c)+23*I*cos(d*x+c)-9*sin(d*x+c))*(a*(I*sin(d*x+c)+cos(d
*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^5*a^2
```

maxima [A] time = 0.53, size = 40, normalized size = 0.68

$$\frac{2i\left(9\,(i\,a\tan(dx+c)+a)^{\frac{11}{2}}-22\,(i\,a\tan(dx+c)+a)^{\frac{9}{2}}a\right)}{99\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] 2/99*I*(9*(I*a*tan(d*x + c) + a)^(11/2) - 22*(I*a*tan(d*x + c) + a)^(9/2)*a
)/(a^3*d)
```

mupad [B] time = 6.42, size = 370, normalized size = 6.27

$$-\frac{a^2\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,128\mathrm{i}}{99\,d}-\frac{a^2\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,64\mathrm{i}}{99\,d\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}+\frac{a^2\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,512\mathrm{i}}{33\,d\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)^2}-\frac{a^2\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2}\right.}{\mathrm{e}^{c\,2\mathrm{i}+d\,x}}}}{99\,d\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(5/2)/cos(c + d*x)^4,x)
```

```
[Out] (a^2*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/
2)*512i)/(33*d*(exp(c*2i + d*x*2i) + 1)^2) - (a^2*(a - (a*(exp(c*2i + d*x*2
i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*64i)/(99*d*(exp(c*2i + d*x*
2i) + 1)) - (a^2*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2
i) + 1))^(1/2)*128i)/(99*d) - (a^2*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)
/(exp(c*2i + d*x*2i) + 1))^(1/2)*2944i)/(99*d*(exp(c*2i + d*x*2i) + 1)^3) +
 (a^2*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1
/2)*2176i)/(99*d*(exp(c*2i + d*x*2i) + 1)^4) - (a^2*(a - (a*(exp(c*2i + d*x
*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*64i)/(11*d*(exp(c*2i + d*
x*2i) + 1)^5)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4*(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.309 $\int \sec^2(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx$

Optimal. Leaf size=29

$$-\frac{2i(a+ia\tan(c+dx))^{7/2}}{7ad}$$

```
[Out] -2/7*I*(a+I*a*tan(d*x+c))^(7/2)/a/d
```

Rubi [A] time = 0.06, antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = $\{3487, 32\}$

$$-\frac{2i(a+ia\tan(c+dx))^{7/2}}{7ad}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((-2*I)/7)*(a + I*a*Tan[c + d*x])^(7/2))/(a*d)
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^2(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx &= -\frac{i\,\text{Subst}\left(\int (a+x)^{5/2}\,dx, x, ia\tan(c+dx)\right)}{ad}\\ &= -\frac{2i(a+ia\tan(c+dx))^{7/2}}{7ad}\end{aligned}$$

Mathematica [B] time = 0.44, size = 73, normalized size = 2.52

$$\frac{2a^2\sec^3(c+dx)\sqrt{a+ia\tan(c+dx)}\,(\sin(3c+5dx)-i\cos(3c+5dx))}{7d(\cos(dx)+i\sin(dx))^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (2*a^2*Sec[c + d*x]^3*((-I)*Cos[3*c + 5*d*x] + Sin[3*c + 5*d*x])*Sqrt[a + I
*a*Tan[c + d*x]])/(7*d*(Cos[d*x] + I*Sin[d*x])^2)
```

fricas [B] time = 0.67, size = 73, normalized size = 2.52

$$-\frac{16i\sqrt{2}\,a^2\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\,e^{(7i\,dx+7i\,c)}}{7\left(de^{(6i\,dx+6i\,c)}+3\,de^{(4i\,dx+4i\,c)}+3\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] -16/7*I*sqrt(2)*a^2*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(7*I*d*x + 7*I*c)/(
d*e^(6*I*d*x + 6*I*c) + 3*d*e^(4*I*d*x + 4*I*c) + 3*d*e^(2*I*d*x + 2*I*c) +
 d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(5/2)*sec(d*x + c)^2, x)
```

maple [A] time = 0.18, size = 24, normalized size = 0.83

$$-\frac{2i\,(a+ia\tan(dx+c))^{\frac{7}{2}}}{7da}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] -2/7*I*(a+I*a*tan(d*x+c))^(7/2)/d/a
```

maxima [A] time = 0.32, size = 21, normalized size = 0.72

$$-\frac{2i\,(i\,a\tan(dx+c)+a)^{\frac{7}{2}}}{7\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] -2/7*I*(I*a*tan(d*x + c) + a)^(7/2)/(a*d)
```

mupad [B] time = 6.35, size = 242, normalized size = 8.34

$$-\frac{a^2\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\;16i}{7\,d}+\frac{a^2\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\;48i}{7\,d\,\left(e^{c\,2i+d\,x\,2i}+1\right)}-\frac{a^2\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\;48i}{7\,d\,\left(e^{c\,2i+d\,x\,2i}+1\right)^2}+\frac{a^2\sqrt{a-\frac{a\left(e^{c\,2i+d\,x}\right.}{e^{c\,2i+d}}}}{7\,d\,\left(e^{c\,2i+d\,x\,2}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(5/2)/cos(c + d*x)^2,x)
```

```
[Out] (a^2*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/
2)*48i)/(7*d*(exp(c*2i + d*x*2i) + 1)) - (a^2*(a - (a*(exp(c*2i + d*x*2i)*1
i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*16i)/(7*d) - (a^2*(a - (a*(exp(
c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*48i)/(7*d*(exp(
c*2i + d*x*2i) + 1)^2) + (a^2*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp
(c*2i + d*x*2i) + 1))^(1/2)*16i)/(7*d*(exp(c*2i + d*x*2i) + 1)^3)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2*(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.310 $\int \cos^2(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx$

Optimal. Leaf size=89

$$\frac{ia^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{\sqrt{2}\,d}-\frac{ia^3\sqrt{a+ia\tan(c+dx)}}{d(a-ia\tan(c+dx))}$$

```
[Out] 1/2*I*a^(5/2)*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))/d*2^(1/
2)-I*a^3*(a+I*a*tan(d*x+c))^(1/2)/d/(a-I*a*tan(d*x+c))
```

Rubi [A] time = 0.08, antiderivative size = 89, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = $\{3487, 47, 63, 206\}$

$$\frac{ia^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{\sqrt{2}\,d}-\frac{ia^3\sqrt{a+ia\tan(c+dx)}}{d(a-ia\tan(c+dx))}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (I*a^(5/2)*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a])])/(Sqrt[2]*
d) - (I*a^3*Sqrt[a + I*a*Tan[c + d*x]])/(d*(a - I*a*Tan[c + d*x]))
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^2(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx = -\frac{(ia^3)\,\text{Subst}\left(\int \frac{\sqrt{a+x}}{(a-x)^2}\,dx, x, ia\tan(c+dx)\right)}{d}$$
$$= -\frac{ia^3\sqrt{a+ia\tan(c+dx)}}{d(a-ia\tan(c+dx))} + \frac{(ia^3)\,\text{Subst}\left(\int \frac{1}{(a-x)\sqrt{a+x}}\,dx, x, ia\tan(c\right.}{2d}$$
$$= -\frac{ia^3\sqrt{a+ia\tan(c+dx)}}{d(a-ia\tan(c+dx))} + \frac{(ia^3)\,\text{Subst}\left(\int \frac{1}{2a-x^2}\,dx, x, \sqrt{a+ia\tan(\right.}{d}$$
$$= \frac{ia^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{\sqrt{2}\,d} - \frac{ia^3\sqrt{a+ia\tan(c+dx)}}{d(a-ia\tan(c+dx))}$$

Mathematica [A] time = 0.66, size = 116, normalized size = 1.30

$$-\frac{ie^{-5i(c+dx)}\left(1+e^{2i(c+dx)}\right)^{5/2}\left(\frac{ae^{2i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{5/2}\left(e^{i(c+dx)}\sqrt{1+e^{2i(c+dx)}}-\sinh^{-1}\left(e^{i(c+dx)}\right)\right)}{\sqrt{2}\,d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((-I)*((a*E^((2*I)*(c + d*x)))/(1 + E^((2*I)*(c + d*x))))^(5/2)*(1 + E^((2*
I)*(c + d*x)))^(5/2)*(E^(I*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))] - ArcSi
nh[E^(I*(c + d*x))]))/(Sqrt[2]*d*E^((5*I)*(c + d*x)))
```

fricas [B] time = 0.56, size = 236, normalized size = 2.65

$$-\frac{\sqrt{2}\sqrt{-\frac{a^5}{d^2}}\,d\log\left(\frac{2\left(2\,a^3e^{(i\,dx+i\,c)}+\sqrt{-\frac{a^5}{d^2}}\left(2i\,de^{(2i\,dx+2i\,c)}+2i\,d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\right)e^{(-i\,dx-i\,c)}}{a^2}\right)-\sqrt{2}\sqrt{-\frac{a^5}{d^2}}\,d\log\left(\frac{2\left(2\,a^3e^{(i\,dx+i\,c)}+\sqrt{-\frac{a^5}{d^2}}\right.}{\right.}\right.}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] -1/4*(sqrt(2)*sqrt(-a^5/d^2)*d*log(2*(2*a^3*e^(I*d*x + I*c) + sqrt(-a^5/d^2
)*(2*I*d*e^(2*I*d*x + 2*I*c) + 2*I*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)))*e^
(-I*d*x - I*c)/a^2) - sqrt(2)*sqrt(-a^5/d^2)*d*log(2*(2*a^3*e^(I*d*x + I*c)
 + sqrt(-a^5/d^2)*(-2*I*d*e^(2*I*d*x + 2*I*c) - 2*I*d)*sqrt(a/(e^(2*I*d*x +
 2*I*c) + 1)))*e^(-I*d*x - I*c)/a^2) - sqrt(2)*(-2*I*a^2*e^(3*I*d*x + 3*I*c
) - 2*I*a^2*e^(I*d*x + I*c))*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)))/d
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 1.18, size = 398, normalized size = 4.47

$$-\frac{\left(i\sin(dx+c)\cos(dx+c)\,\text{arctanh}\left(\frac{\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\,\sin(dx+c)\sqrt{2}}{2\cos(dx+c)}\right)\left(-\frac{2\cos(dx+c)}{1+\cos(dx+c)}\right)^{\frac{3}{2}}\sqrt{2}+i\left(-\frac{2\cos(dx+c)}{1+\cos(dx+c)}\right)^{\frac{3}{2}}\text{arctanh}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] -1/4/d*(I*2^(1/2)*sin(d*x+c)*cos(d*x+c)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d
*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))
^(3/2)+I*2^(1/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c
)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(3/2)*sin(d*x+c)+sin(d
*x+c)*cos(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(3/2)*arctan(1/2*(-2*cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)+2^(1/2)*arctan(1/2*(-2*cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(3/2)*sin(
d*x+c)+8*I*cos(d*x+c)^4-4*I*cos(d*x+c)^3-8*cos(d*x+c)^3*sin(d*x+c)-4*I*cos(
d*x+c)^2+4*cos(d*x+c)^2*sin(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c)
)^(1/2)/(I*sin(d*x+c)+cos(d*x+c)-1)/cos(d*x+c)*a^2
```

maxima [A] time = 0.55, size = 98, normalized size = 1.10

$$-\frac{i\left(\sqrt{2}\,a^{\frac{7}{2}}\log\left(-\frac{\sqrt{2}\,\sqrt{a}-\sqrt{i\,a\tan\left(dx+c\right)+a}}{\sqrt{2}\,\sqrt{a}+\sqrt{i\,a\tan\left(dx+c\right)+a}}\right)-\frac{8\,\sqrt{i\,a\tan\left(dx+c\right)+a}\,a^{4}}{2i\,a\tan\left(dx+c\right)-2\,a}\right)}{4\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] -1/4*I*(sqrt(2)*a^(7/2)*log(-(sqrt(2)*sqrt(a) - sqrt(I*a*tan(d*x + c) + a))
/(sqrt(2)*sqrt(a) + sqrt(I*a*tan(d*x + c) + a))) - 8*sqrt(I*a*tan(d*x + c)
+ a)*a^4/(2*I*a*tan(d*x + c) - 2*a))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \cos\left(c+d\,x\right)^2\,{\left(a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^(5/2),x)
```

```
[Out] int(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2*(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.311 $\int \cos^4(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx$

Optimal. Leaf size=137

$$-\frac{3ia^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{16\sqrt{2}d}-\frac{ia^4\sqrt{a+ia\tan(c+dx)}}{4d(a-ia\tan(c+dx))^2}-\frac{3ia^3\sqrt{a+ia\tan(c+dx)}}{16d(a-ia\tan(c+dx))}$$

```
[Out] -3/32*I*a^(5/2)*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))/d*2^(
1/2)-1/4*I*a^4*(a+I*a*tan(d*x+c))^(1/2)/d/(a-I*a*tan(d*x+c))^2-3/16*I*a^3*(
a+I*a*tan(d*x+c))^(1/2)/d/(a-I*a*tan(d*x+c))
```

Rubi [A] time = 0.09, antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {3487, 51, 63, 206}

$$-\frac{ia^4\sqrt{a+ia\tan(c+dx)}}{4d(a-ia\tan(c+dx))^2}-\frac{3ia^3\sqrt{a+ia\tan(c+dx)}}{16d(a-ia\tan(c+dx))}-\frac{3ia^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{16\sqrt{2}d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((-3*I)/16)*a^(5/2)*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a])])
/(Sqrt[2]*d) - ((I/4)*a^4*Sqrt[a + I*a*Tan[c + d*x]])/(d*(a - I*a*Tan[c + d
*x])^2) - (((3*I)/16)*a^3*Sqrt[a + I*a*Tan[c + d*x]])/(d*(a - I*a*Tan[c + d
*x]))
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^4(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx = -\frac{(ia^5)\,\text{Subst}\left(\int \frac{1}{(a-x)^3\sqrt{a+x}}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{ia^4\sqrt{a+ia\tan(c+dx)}}{4d(a-ia\tan(c+dx))^2} - \frac{(3ia^4)\,\text{Subst}\left(\int \frac{1}{(a-x)^2\sqrt{a+x}}\,dx, x, ia\tan(c+\right.}{8d}$$

$$= -\frac{ia^4\sqrt{a+ia\tan(c+dx)}}{4d(a-ia\tan(c+dx))^2} - \frac{3ia^3\sqrt{a+ia\tan(c+dx)}}{16d(a-ia\tan(c+dx))} - \frac{(3ia^3)\,\text{Subst}\left(\right.}{}$$

$$= -\frac{ia^4\sqrt{a+ia\tan(c+dx)}}{4d(a-ia\tan(c+dx))^2} - \frac{3ia^3\sqrt{a+ia\tan(c+dx)}}{16d(a-ia\tan(c+dx))} - \frac{(3ia^3)\,\text{Subst}\left(\right.}{}$$

$$= -\frac{3ia^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{16\sqrt{2}\,d} - \frac{ia^4\sqrt{a+ia\tan(c+dx)}}{4d(a-ia\tan(c+dx))^2} - \frac{3ia^3\sqrt{a+}}{16d(a-i}$$

Mathematica [A] time = 0.84, size = 116, normalized size = 0.85

$$-\frac{ia^2e^{-i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\left(e^{i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\left(5+2e^{2i(c+dx)}\right)+3\sinh^{-1}\left(e^{i(c+dx)}\right)\right)\sqrt{a+ia\tan(c+dx)}}{32d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((-1/32*I)*a^2*Sqrt[1 + E^((2*I)*(c + d*x))]*(E^(I*(c + d*x))*Sqrt[1 + E^((
2*I)*(c + d*x))]*(5 + 2*E^((2*I)*(c + d*x))) + 3*ArcSinh[E^(I*(c + d*x))])*
Sqrt[a + I*a*Tan[c + d*x]])/(d*E^(I*(c + d*x)))
```

fricas [B] time = 0.47, size = 262, normalized size = 1.91

$$\frac{3\sqrt{\frac{1}{2}}\sqrt{-\frac{a^5}{d^2}}\,d\log\left(\frac{\left(32\,a^3e^{(i\,dx+i\,c)}+\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{-\frac{a^5}{d^2}}\left(32i\,de^{(2i\,dx+2i\,c)}+32i\,d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\right)e^{(-i\,dx-i\,c)}}{8\,a^2}\right)-3\sqrt{\frac{1}{2}}\sqrt{-\frac{a^5}{d^2}}\,d\log\left(\frac{\left(32\,a^3e^{(i\,dx+i\,c}\right.}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/32*(3*sqrt(1/2)*sqrt(-a^5/d^2)*d*log(1/8*(32*a^3*e^(I*d*x + I*c) + sqrt(2
)*sqrt(1/2)*sqrt(-a^5/d^2)*(32*I*d*e^(2*I*d*x + 2*I*c) + 32*I*d)*sqrt(a/(e^
(2*I*d*x + 2*I*c) + 1)))*e^(-I*d*x - I*c)/a^2) - 3*sqrt(1/2)*sqrt(-a^5/d^2)
*d*log(1/8*(32*a^3*e^(I*d*x + I*c) + sqrt(2)*sqrt(1/2)*sqrt(-a^5/d^2)*(-32*
I*d*e^(2*I*d*x + 2*I*c) - 32*I*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)))*e^(-I*
d*x - I*c)/a^2) + sqrt(2)*(-2*I*a^2*e^(5*I*d*x + 5*I*c) - 7*I*a^2*e^(3*I*d*
x + 3*I*c) - 5*I*a^2*e^(I*d*x + I*c))*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)))/d
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 1.34, size = 744, normalized size = 5.43

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 1/256/d*(128*I*cos(d*x+c)^7+48*I*cos(d*x+c)^4+3*cos(d*x+c)^3*2^(1/2)*sin(d*
x+c)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c
)/(1+cos(d*x+c)))^(7/2)+9*I*sin(d*x+c)*cos(d*x+c)^2*2^(1/2)*arctanh(1/2*(-2
*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*
x+c)/(1+cos(d*x+c)))^(7/2)+9*cos(d*x+c)^2*2^(1/2)*sin(d*x+c)*arctan(1/2*(-2
*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(
7/2)+3*I*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*
x+c)*2^(1/2))*2^(1/2)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(7/2)*sin(d*x+c)+9*cos
(d*x+c)*2^(1/2)*sin(d*x+c)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*
2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(7/2)+3*2^(1/2)*arctan(1/2*(-2*cos(
d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(7/2)*
sin(d*x+c)+96*I*cos(d*x+c)^6-16*I*cos(d*x+c)^5+256*sin(d*x+c)*cos(d*x+c)^7+
3*I*sin(d*x+c)*cos(d*x+c)^3*2^(1/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(7/
2)-128*sin(d*x+c)*cos(d*x+c)^6-256*I*cos(d*x+c)^8+32*cos(d*x+c)^5*sin(d*x+c
)+9*I*sin(d*x+c)*cos(d*x+c)*2^(1/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(7/
2)-48*sin(d*x+c)*cos(d*x+c)^4)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/
2)/(I*sin(d*x+c)+cos(d*x+c)-1)/cos(d*x+c)^3*a^2
```

maxima [A] time = 0.62, size = 140, normalized size = 1.02

$$\frac{i\left(3\sqrt{2}a^{\frac{7}{2}}\log\left(-\frac{\sqrt{2}\sqrt{a}-\sqrt{i\,a\tan(dx+c)+a}}{\sqrt{2}\sqrt{a}+\sqrt{i\,a\tan(dx+c)+a}}\right)+\frac{4\left(3\,(i\,a\tan(dx+c)+a)^{\frac{3}{2}}a^4-10\,\sqrt{i\,a\tan(dx+c)+a}\,a^5\right)}{(i\,a\tan(dx+c)+a)^2-4\,(i\,a\tan(dx+c)+a)a+4\,a^2}\right)}{64\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] 1/64*I*(3*sqrt(2)*a^(7/2)*log(-(sqrt(2)*sqrt(a) - sqrt(I*a*tan(d*x + c) + a
))/(sqrt(2)*sqrt(a) + sqrt(I*a*tan(d*x + c) + a))) + 4*(3*(I*a*tan(d*x + c)
 + a)^(3/2)*a^4 - 10*sqrt(I*a*tan(d*x + c) + a)*a^5)/((I*a*tan(d*x + c) + a
)^2 - 4*(I*a*tan(d*x + c) + a)*a + 4*a^2))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \cos\left(c+d\,x\right)^4\,{\left(a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^(5/2),x)
```

```
[Out] int(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4*(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.312 $\int \cos^6(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx$

Optimal. Leaf size=210

$$-\frac{35ia^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{128\sqrt{2}d}-\frac{ia^6}{6d(a-ia\tan(c+dx))^3\sqrt{a+ia\tan(c+dx)}}-\frac{7ia^5}{48d(a-ia\tan(c+dx))^2\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] -35/256*I*a^(5/2)*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))/d*2
^(1/2)+35/128*I*a^3/d/(a+I*a*tan(d*x+c))^(1/2)-1/6*I*a^6/d/(a+I*a*tan(d*x+c
))^(1/2)/(a-I*a*tan(d*x+c))^3-7/48*I*a^5/d/(a+I*a*tan(d*x+c))^(1/2)/(a-I*a*
tan(d*x+c))^2-35/192*I*a^4/d/(a+I*a*tan(d*x+c))^(1/2)/(a-I*a*tan(d*x+c))
```

Rubi [A] time = 0.12, antiderivative size = 210, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {3487, 51, 63, 206}

$$-\frac{ia^6}{6d(a-ia\tan(c+dx))^3\sqrt{a+ia\tan(c+dx)}}-\frac{7ia^5}{48d(a-ia\tan(c+dx))^2\sqrt{a+ia\tan(c+dx)}}-\frac{3}{192d(a-ia\tan(c+}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^6*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((-35*I)/128)*a^(5/2)*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a])
])/(Sqrt[2]*d) + (((35*I)/128)*a^3)/(d*Sqrt[a + I*a*Tan[c + d*x]]) - ((I/6)
*a^6)/(d*(a - I*a*Tan[c + d*x])^3*Sqrt[a + I*a*Tan[c + d*x]]) - (((7*I)/48)
*a^5)/(d*(a - I*a*Tan[c + d*x])^2*Sqrt[a + I*a*Tan[c + d*x]]) - (((35*I)/19
2)*a^4)/(d*(a - I*a*Tan[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^6(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx = -\frac{\left(ia^7\right)\text{Subst}\left(\int \frac{1}{(a-x)^4(a+x)^{3/2}}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{ia^6}{6d(a-ia\tan(c+dx))^3\sqrt{a+ia\tan(c+dx)}} - \frac{\left(7ia^6\right)\text{Subst}\left(\int \frac{}{(a-}\right.}{}$$

$$= -\frac{ia^6}{6d(a-ia\tan(c+dx))^3\sqrt{a+ia\tan(c+dx)}} - \frac{}{48d(a-ia\tan(c+}$$

$$= -\frac{ia^6}{6d(a-ia\tan(c+dx))^3\sqrt{a+ia\tan(c+dx)}} - \frac{}{48d(a-ia\tan(c+}$$

$$= \frac{35ia^3}{128d\sqrt{a+ia\tan(c+dx)}} - \frac{ia^6}{6d(a-ia\tan(c+dx))^3\sqrt{a+ia\tan(c+}}$$

$$= \frac{35ia^3}{128d\sqrt{a+ia\tan(c+dx)}} - \frac{ia^6}{6d(a-ia\tan(c+dx))^3\sqrt{a+ia\tan(c+}}$$

$$= -\frac{35ia^{5/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{128\sqrt{2}\,d} + \frac{35ia^3}{128d\sqrt{a+ia\tan(c+dx)}} - \frac{}{6d(}$$

Mathematica [A] time = 0.96, size = 142, normalized size = 0.68

$$-\frac{ia^2e^{-2i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\left(\sqrt{1+e^{2i(c+dx)}}\left(87e^{2i(c+dx)}+38e^{4i(c+dx)}+8e^{6i(c+dx)}-48\right)+105e^{i(c+dx)}\sinh^{-1}\left(e^{i(c+}\right.\right.}{768d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^6*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((-1/768*I)*a^2*Sqrt[1 + E^((2*I)*(c + d*x))]*(Sqrt[1 + E^((2*I)*(c + d*x))
]*(-48 + 87*E^((2*I)*(c + d*x)) + 38*E^((4*I)*(c + d*x)) + 8*E^((6*I)*(c +
d*x))) + 105*E^(I*(c + d*x))*ArcSinh[E^(I*(c + d*x))])*Sqrt[a + I*a*Tan[c +
 d*x]])/(d*E^((2*I)*(c + d*x)))
```

fricas [A] time = 0.65, size = 308, normalized size = 1.47

$$\left(105\sqrt{\frac{1}{2}}\sqrt{-\frac{a^5}{d^2}}\,de^{(i\,dx+i\,c)}\log\left(\frac{\left(256\,a^3e^{(i\,dx+i\,c)}+\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{-\frac{a^5}{d^2}}\left(256i\,de^{(2i\,dx+2i\,c)}+256i\,d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\right)e^{(-i\,dx-i\,c)}}{64\,a^2}\right)-105\sqrt{\frac{1}{2}}\sqrt{-\frac{}{}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/768*(105*sqrt(1/2)*sqrt(-a^5/d^2)*d*e^(I*d*x + I*c)*log(1/64*(256*a^3*e^(
I*d*x + I*c) + sqrt(2)*sqrt(1/2)*sqrt(-a^5/d^2)*(256*I*d*e^(2*I*d*x + 2*I*c
) + 256*I*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)))*e^(-I*d*x - I*c)/a^2) - 105
*sqrt(1/2)*sqrt(-a^5/d^2)*d*e^(I*d*x + I*c)*log(1/64*(256*a^3*e^(I*d*x + I*
c) + sqrt(2)*sqrt(1/2)*sqrt(-a^5/d^2)*(-256*I*d*e^(2*I*d*x + 2*I*c) - 256*I
*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)))*e^(-I*d*x - I*c)/a^2) + sqrt(2)*(-8*
I*a^2*e^(8*I*d*x + 8*I*c) - 46*I*a^2*e^(6*I*d*x + 6*I*c) - 125*I*a^2*e^(4*I
```

```
*d*x + 4*I*c) - 39*I*a^2*e^(2*I*d*x + 2*I*c) + 48*I*a^2)*sqrt(a/(e^(2*I*d*x
 + 2*I*c) + 1)))*e^(-I*d*x - I*c)/d
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 1.62, size = 1088, normalized size = 5.18

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] -1/24576/d*(-105*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*arctanh(1/2*(-2*co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*cos(d*x+c)^5*
sin(d*x+c)*2^(1/2)+16384*I*cos(d*x+c)^12-5120*I*cos(d*x+c)^10+896*I*cos(d*x
+c)^8+2240*I*cos(d*x+c)^7-6720*I*cos(d*x+c)^6-525*I*(-2*cos(d*x+c)/(1+cos(d
*x+c)))^(11/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/
cos(d*x+c)*2^(1/2))*cos(d*x+c)^4*sin(d*x+c)*2^(1/2)-105*(-2*cos(d*x+c)/(1+c
os(d*x+c)))^(11/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))
*2^(1/2)*sin(d*x+c)-8192*I*cos(d*x+c)^11-16384*sin(d*x+c)*cos(d*x+c)^11-307
2*sin(d*x+c)*cos(d*x+c)^9+3584*sin(d*x+c)*cos(d*x+c)^8+8192*sin(d*x+c)*cos(
d*x+c)^10-105*sin(d*x+c)*cos(d*x+c)^5*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)
*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)-525*sin(d
*x+c)*cos(d*x+c)^4*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*arctan(1/2*(-2*cos
(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)-1050*sin(d*x+c)*cos(d*x+c)^3
*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x
+c)))^(1/2)*2^(1/2))*2^(1/2)-1050*sin(d*x+c)*cos(d*x+c)^2*(-2*cos(d*x+c)/(1
+cos(d*x+c)))^(11/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2
))*2^(1/2)-525*sin(d*x+c)*cos(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*
arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)-4480*sin(d
*x+c)*cos(d*x+c)^7+6720*sin(d*x+c)*cos(d*x+c)^6+512*I*cos(d*x+c)^9-105*I*2^
(1/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c
)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*sin(d*x+c)-1050*I*(-2*cos(
d*x+c)/(1+cos(d*x+c)))^(11/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*cos(d*x+c)^3*sin(d*x+c)*2^(1/2)-1050*I*(
-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*cos(d*x+c)^2*sin(d*x+c)*2^(1/2)-5
25*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*cos(d*x+c)*sin(d*x+c)*2^(1/
2))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/(I*sin(d*x+c)+cos(d*x+c)
-1)/cos(d*x+c)^5*a^2
```

maxima [A] time = 0.67, size = 194, normalized size = 0.92

$$\frac{i\left(105\sqrt{2}\,a^{\frac{7}{2}}\log\left(-\frac{\sqrt{2}\sqrt{a}-\sqrt{i\,a\tan(dx+c)+a}}{\sqrt{2}\sqrt{a}+\sqrt{i\,a\tan(dx+c)+a}}\right)+\frac{4\left(105\,(i\,a\tan(dx+c)+a)^{3}a^{4}-560\,(i\,a\tan(dx+c)+a)^{2}a^{5}+924\,(i\,a\tan(dx+c)+a)a^{6}-384\,a^{7}\right)}{(i\,a\tan(dx+c)+a)^{\frac{7}{2}}-6\,(i\,a\tan(dx+c)+a)^{\frac{5}{2}}a+12\,(i\,a\tan(dx+c)+a)^{\frac{3}{2}}a^{2}-8\,\sqrt{i\,a\tan(dx+c)+a}\,a^{3}}\right)}{1536\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] 1/1536*I*(105*sqrt(2)*a^(7/2)*log(-(sqrt(2)*sqrt(a) - sqrt(I*a*tan(d*x + c)
 + a))/(sqrt(2)*sqrt(a) + sqrt(I*a*tan(d*x + c) + a))) + 4*(105*(I*a*tan(d*
```

```
x + c) + a)^3*a^4 - 560*(I*a*tan(d*x + c) + a)^2*a^5 + 924*(I*a*tan(d*x + c
) + a)*a^6 - 384*a^7)/((I*a*tan(d*x + c) + a)^(7/2) - 6*(I*a*tan(d*x + c) +
 a)^(5/2)*a + 12*(I*a*tan(d*x + c) + a)^(3/2)*a^2 - 8*sqrt(I*a*tan(d*x + c)
 + a)*a^3))/(a*d)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.00

$$\int \cos(c+d\,x)^6\,(a+a\tan(c+d\,x)\,1\mathrm{i})^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^(5/2),x)
```

```
[Out] int(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^(5/2), x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**6*(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.313 $\int \sec^3(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx$

Optimal. Leaf size=147

$$\frac{256ia^4\sec^3(c+dx)}{315d(a+ia\tan(c+dx))^{3/2}}+\frac{64ia^3\sec^3(c+dx)}{105d\sqrt{a+ia\tan(c+dx)}}+\frac{8ia^2\sec^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{21d}+\frac{2ia\sec^3(c+dx)(a$$

```
[Out] 64/105*I*a^3*sec(d*x+c)^3/d/(a+I*a*tan(d*x+c))^(1/2)+8/21*I*a^2*sec(d*x+c)^
3*(a+I*a*tan(d*x+c))^(1/2)/d+256/315*I*a^4*sec(d*x+c)^3/d/(a+I*a*tan(d*x+c)
)^(3/2)+2/9*I*a*sec(d*x+c)^3*(a+I*a*tan(d*x+c))^(3/2)/d
```

Rubi [A] time = 0.24, antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {3494, 3493}

$$\frac{256ia^4\sec^3(c+dx)}{315d(a+ia\tan(c+dx))^{3/2}}+\frac{64ia^3\sec^3(c+dx)}{105d\sqrt{a+ia\tan(c+dx)}}+\frac{8ia^2\sec^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{21d}+\frac{2ia\sec^3(c+dx)(a$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((256*I)/315)*a^4*Sec[c + d*x]^3)/(d*(a + I*a*Tan[c + d*x])^(3/2)) + (((64
*I)/105)*a^3*Sec[c + d*x]^3)/(d*Sqrt[a + I*a*Tan[c + d*x]]) + (((8*I)/21)*a
^2*Sec[c + d*x]^3*Sqrt[a + I*a*Tan[c + d*x]])/d + (((2*I)/9)*a*Sec[c + d*x]
^3*(a + I*a*Tan[c + d*x])^(3/2))/d
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int \sec^3(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx &= \frac{2ia\sec^3(c+dx)(a+ia\tan(c+dx))^{3/2}}{9d}+\frac{1}{3}(4a)\int \sec^3(c+dx)(a+ia\\ &= \frac{8ia^2\sec^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{21d}+\frac{2ia\sec^3(c+dx)(a+ia\tan(c\\ &= \frac{64ia^3\sec^3(c+dx)}{105d\sqrt{a+ia\tan(c+dx)}}+\frac{8ia^2\sec^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{21d}+\frac{2}{}\\ &= \frac{256ia^4\sec^3(c+dx)}{315d(a+ia\tan(c+dx))^{3/2}}+\frac{64ia^3\sec^3(c+dx)}{105d\sqrt{a+ia\tan(c+dx)}}+\frac{8ia^2\sec^3(c\end{aligned}$$

Mathematica [A] time = 0.84, size = 103, normalized size = 0.70

$$\frac{2a^2(\sin(2c)+i\cos(2c))\sec^3(c+dx)\sqrt{a+ia\tan(c+dx)}\,(242\cos(2(c+dx))+54i\tan(c+dx)+89i\sin(3(c+dx}{315d(\cos(dx)+i\sin(dx))^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^3*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (2*a^2*Sec[c + d*x]^3*(I*Cos[2*c] + Sin[2*c])*(77 + 242*Cos[2*(c + d*x)] +
(89*I)*Sec[c + d*x]*Sin[3*(c + d*x)] + (54*I)*Tan[c + d*x])*Sqrt[a + I*a*Ta
n[c + d*x]])/(315*d*(Cos[d*x] + I*Sin[d*x])^2)
```

fricas [A] time = 0.60, size = 121, normalized size = 0.82

$$\frac{\sqrt{2}\left(3360i\,a^2e^{(6i\,dx+6i\,c)}+4032i\,a^2e^{(4i\,dx+4i\,c)}+2304i\,a^2e^{(2i\,dx+2i\,c)}+512i\,a^2\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}}{315\left(de^{(8i\,dx+8i\,c)}+4\,de^{(6i\,dx+6i\,c)}+6\,de^{(4i\,dx+4i\,c)}+4\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/315*sqrt(2)*(3360*I*a^2*e^(6*I*d*x + 6*I*c) + 4032*I*a^2*e^(4*I*d*x + 4*I
*c) + 2304*I*a^2*e^(2*I*d*x + 2*I*c) + 512*I*a^2)*sqrt(a/(e^(2*I*d*x + 2*I*
c) + 1))/(d*e^(8*I*d*x + 8*I*c) + 4*d*e^(6*I*d*x + 6*I*c) + 6*d*e^(4*I*d*x
+ 4*I*c) + 4*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(5/2)*sec(d*x + c)^3, x)
```

maple [A] time = 1.19, size = 117, normalized size = 0.80

$$\frac{2\left(256i\left(\cos^5(dx+c)\right)+256\sin(dx+c)\left(\cos^4(dx+c)\right)-32i\left(\cos^3(dx+c)\right)+96\left(\cos^2(dx+c)\right)\sin(dx+c)\right.}{315d\cos(dx+c)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 2/315/d*(256*I*cos(d*x+c)^5+256*sin(d*x+c)*cos(d*x+c)^4-32*I*cos(d*x+c)^3+9
6*cos(d*x+c)^2*sin(d*x+c)+95*I*cos(d*x+c)-35*sin(d*x+c))*(a*(I*sin(d*x+c)+c
os(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^4*a^2
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [B] time = 7.77, size = 301, normalized size = 2.05

$$\frac{a^2\,\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}}{3\,d\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}-\frac{32\mathrm{i}\,a^2\,\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}}{5\,d\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)^2}+\frac{96\mathrm{i}\,a^2\,\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\right.}{\mathrm{e}^{c\,2\mathrm{i}+d\,x}}}}{7\,d\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(5/2)/cos(c + d*x)^3,x)
```

```
[Out] (a^2*exp(- c*1i - d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2
i + d*x*2i) + 1))^(1/2)*32i)/(3*d*(exp(c*2i + d*x*2i) + 1)) - (a^2*exp(- c*
1i - d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) +
 1))^(1/2)*96i)/(5*d*(exp(c*2i + d*x*2i) + 1)^2) + (a^2*exp(- c*1i - d*x*1i
)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*
96i)/(7*d*(exp(c*2i + d*x*2i) + 1)^3) - (a^2*exp(- c*1i - d*x*1i)*(a - (a*(
exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*32i)/(9*d*(
exp(c*2i + d*x*2i) + 1)^4)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3*(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.314 $\int \sec(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx$

Optimal. Leaf size=104

$$\frac{64ia^3\sec(c+dx)}{15d\sqrt{a+ia\tan(c+dx)}}+\frac{16ia^2\sec(c+dx)\sqrt{a+ia\tan(c+dx)}}{15d}+\frac{2ia\sec(c+dx)(a+ia\tan(c+dx))^{3/2}}{5d}$$

```
[Out] 64/15*I*a^3*sec(d*x+c)/d/(a+I*a*tan(d*x+c))^(1/2)+16/15*I*a^2*sec(d*x+c)*(a
+I*a*tan(d*x+c))^(1/2)/d+2/5*I*a*sec(d*x+c)*(a+I*a*tan(d*x+c))^(3/2)/d
```

Rubi [A] time = 0.10, antiderivative size = 104, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3494, 3493}

$$\frac{64ia^3\sec(c+dx)}{15d\sqrt{a+ia\tan(c+dx)}}+\frac{16ia^2\sec(c+dx)\sqrt{a+ia\tan(c+dx)}}{15d}+\frac{2ia\sec(c+dx)(a+ia\tan(c+dx))^{3/2}}{5d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((64*I)/15)*a^3*Sec[c + d*x])/(d*Sqrt[a + I*a*Tan[c + d*x]]) + (((16*I)/15
)*a^2*Sec[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])/d + (((2*I)/5)*a*Sec[c + d*x
]*(a + I*a*Tan[c + d*x])^(3/2))/d
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int \sec(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx &= \frac{2ia\sec(c+dx)(a+ia\tan(c+dx))^{3/2}}{5d}+\frac{1}{5}(8a)\int \sec(c+dx)(a+ia\\ &= \frac{16ia^2\sec(c+dx)\sqrt{a+ia\tan(c+dx)}}{15d}+\frac{2ia\sec(c+dx)(a+ia\tan(c\\ &= \frac{64ia^3\sec(c+dx)}{15d\sqrt{a+ia\tan(c+dx)}}+\frac{16ia^2\sec(c+dx)\sqrt{a+ia\tan(c+dx)}}{15d}+\end{aligned}$$

Mathematica [A] time = 0.39, size = 93, normalized size = 0.89

$$\frac{2a^2\sec^2(c+dx)\sqrt{a+ia\tan(c+dx)}\,(\sin(c-dx)+i\cos(c-dx))(7i\sin(2(c+dx))+23\cos(2(c+dx))+20)}{15d(\cos(dx)+i\sin(dx))^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (2*a^2*Sec[c + d*x]^2*(I*Cos[c - d*x] + Sin[c - d*x])*(20 + 23*Cos[2*(c + d
*x)] + (7*I)*Sin[2*(c + d*x)])*Sqrt[a + I*a*Tan[c + d*x]])/(15*d*(Cos[d*x]
+ I*Sin[d*x])^2)
```

fricas [A] time = 0.62, size = 83, normalized size = 0.80

$$\frac{\sqrt{2}\left(120i\,a^2e^{(4i\,dx+4i\,c)}+160i\,a^2e^{(2i\,dx+2i\,c)}+64i\,a^2\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}}{15\left(de^{(4i\,dx+4i\,c)}+2\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/15*sqrt(2)*(120*I*a^2*e^(4*I*d*x + 4*I*c) + 160*I*a^2*e^(2*I*d*x + 2*I*c)
 + 64*I*a^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))/(d*e^(4*I*d*x + 4*I*c) + 2*d
*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(5/2)*sec(d*x + c), x)
```

maple [A] time = 0.90, size = 90, normalized size = 0.87

$$\frac{2\left(32i\left(\cos^3(dx+c)\right)+32\left(\cos^2(dx+c)\right)\sin(dx+c)+11i\cos(dx+c)-3\sin(dx+c)\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\;a}{15d\cos(dx+c)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)*(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 2/15/d*(32*I*cos(d*x+c)^3+32*cos(d*x+c)^2*sin(d*x+c)+11*I*cos(d*x+c)-3*sin(
d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^2*a^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{5}{2}}\sec(dx+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(5/2)*sec(d*x + c), x)
```

mupad [B] time = 6.08, size = 105, normalized size = 1.01

$$\frac{8\,a^2\,\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\,\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,20\mathrm{i}+\mathrm{e}^{c\,4\mathrm{i}+d\,x\,4\mathrm{i}}\,15\mathrm{i}+8\mathrm{i}\right)}{15\,d\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(5/2)/cos(c + d*x),x)
```

```
[Out] (8*a^2*exp(- c*1i - d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c
*2i + d*x*2i) + 1))^(1/2)*(exp(c*2i + d*x*2i)*20i + exp(c*4i + d*x*4i)*15i
+ 8i))/(15*d*(exp(c*2i + d*x*2i) + 1)^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ia (\tan (c+dx) - i))^{\frac{5}{2}} \sec (c+dx)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Integral((I*a*(tan(c + d*x) - I))**(5/2)*sec(c + d*x), x)
```

3.315 $\int \cos(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx$

Optimal. Leaf size=65

$$\frac{2ia\cos(c+dx)(a+ia\tan(c+dx))^{3/2}}{d}-\frac{8ia^2\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{d}$$

```
[Out] -8*I*a^2*cos(d*x+c)*(a+I*a*tan(d*x+c))^(1/2)/d+2*I*a*cos(d*x+c)*(a+I*a*tan(
d*x+c))^(3/2)/d
```

Rubi [A] time = 0.10, antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3494, 3493}

$$\frac{2ia\cos(c+dx)(a+ia\tan(c+dx))^{3/2}}{d}-\frac{8ia^2\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((-8*I)*a^2*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])/d + ((2*I)*a*Cos[c + d
*x]*(a + I*a*Tan[c + d*x])^(3/2))/d
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int \cos(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx &= \frac{2ia\cos(c+dx)(a+ia\tan(c+dx))^{3/2}}{d}+(4a)\int \cos(c+dx)(a+ia\tan(\\ &= -\frac{8ia^2\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{d}+\frac{2ia\cos(c+dx)(a+ia\tan(c+}{d}\end{aligned}$$

Mathematica [A] time = 0.29, size = 46, normalized size = 0.71

$$-\frac{2ia^2\sqrt{a+ia\tan(c+dx)}\,(3\cos(c+dx)-i\sin(c+dx))}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((-2*I)*a^2*(3*Cos[c + d*x] - I*Sin[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])/d
```

fricas [A] time = 0.48, size = 44, normalized size = 0.68

$$\frac{\sqrt{2}\left(-2i\,a^2e^{(2i\,dx+2i\,c)}-4i\,a^2\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] sqrt(2)*(-2*I*a^2*e^(2*I*d*x + 2*I*c) - 4*I*a^2)*sqrt(a/(e^(2*I*d*x + 2*I*c
) + 1))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{5}{2}}\cos(dx+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(5/2)*cos(d*x + c), x)
```

maple [A] time = 1.08, size = 53, normalized size = 0.82

$$-\frac{2\left(3i\cos(dx+c)+\sin(dx+c)\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\,a^2}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)*(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] -2/d*(3*I*cos(d*x+c)+sin(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(
1/2)*a^2
```

maxima [B] time = 0.99, size = 331, normalized size = 5.09

$$\frac{2\left(-3i\,a^{\frac{5}{2}}-\frac{2\,a^{\frac{5}{2}}\sin(dx+c)}{\cos(dx+c)+1}+\frac{9i\,a^{\frac{5}{2}}\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{4\,a^{\frac{5}{2}}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}-\frac{9i\,a^{\frac{5}{2}}\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{2\,a^{\frac{5}{2}}\sin(dx+c)^5}{(\cos(dx+c)+1)^5}+\frac{3i\,a^{\frac{5}{2}}\sin(dx+c)^6}{(\cos(dx+c)+1)^6}\right)\left(-\frac{2i\sin(\cdots}{\cos(dx\cdots}\right.}{d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{5}{2}}\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right)^{\frac{5}{2}}\left(\frac{4i\sin(dx+c)}{\cos(dx+c)+1}-\frac{5\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-\frac{5\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{4i\sin(dx+c)^5}{(\cos(dx+c)+1)^5}+\frac{\mathrm{si}\cdots}{(\mathrm{cos}\cdots}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] 2*(-3*I*a^(5/2) - 2*a^(5/2)*sin(d*x + c)/(cos(d*x + c) + 1) + 9*I*a^(5/2)*s
in(d*x + c)^2/(cos(d*x + c) + 1)^2 + 4*a^(5/2)*sin(d*x + c)^3/(cos(d*x + c)
 + 1)^3 - 9*I*a^(5/2)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 2*a^(5/2)*sin(d
*x + c)^5/(cos(d*x + c) + 1)^5 + 3*I*a^(5/2)*sin(d*x + c)^6/(cos(d*x + c) +
 1)^6)*(-2*I*sin(d*x + c)/(cos(d*x + c) + 1) + sin(d*x + c)^2/(cos(d*x + c)
 + 1)^2 - 1)^(5/2)/(d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(5/2)*(sin(d*x
+ c)/(cos(d*x + c) + 1) - 1)^(5/2)*(4*I*sin(d*x + c)/(cos(d*x + c) + 1) - 5
*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 5*sin(d*x + c)^4/(cos(d*x + c) + 1)^
4 - 4*I*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 + sin(d*x + c)^6/(cos(d*x + c)
+ 1)^6 + 1))
```

mupad [B] time = 0.39, size = 64, normalized size = 0.98

$$-\frac{2\,a^2\,\left(\sin(c+d\,x)+\cos(c+d\,x)\,3\mathrm{i}\right)\,\sqrt{\frac{a\,\left(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i}\right)}{\cos(2\,c+2\,d\,x)+1}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^(5/2),x)
```

```
[Out] -(2*a^2*(cos(c + d*x)*3i + sin(c + d*x))*((a*(cos(2*c + 2*d*x) + sin(2*c +
2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1))^(1/2))/d
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.316 $\int \cos^3(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx$

Optimal. Leaf size=35

$$-\frac{2ia\cos^3(c+dx)(a+ia\tan(c+dx))^{3/2}}{3d}$$

```
[Out] -2/3*I*a*cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(3/2)/d
```

Rubi [A] time = 0.06, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.038$, Rules used = {3493}

$$-\frac{2ia\cos^3(c+dx)(a+ia\tan(c+dx))^{3/2}}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((-2*I)/3)*a*Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^(3/2))/d
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rubi steps

$$\int \cos^3(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx = -\frac{2ia\cos^3(c+dx)(a+ia\tan(c+dx))^{3/2}}{3d}$$

Mathematica [A] time = 0.34, size = 69, normalized size = 1.97

$$\frac{2a^2\cos^2(c+dx)\sqrt{a+ia\tan(c+dx)}\,(\sin(c+3dx)-i\cos(c+3dx))}{3d(\cos(dx)+i\sin(dx))^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (2*a^2*Cos[c + d*x]^2*((-I)*Cos[c + 3*d*x] + Sin[c + 3*d*x])*Sqrt[a + I*a*T
an[c + d*x]])/(3*d*(Cos[d*x] + I*Sin[d*x])^2)
```

fricas [B] time = 0.54, size = 59, normalized size = 1.69

$$\frac{\sqrt{2}\left(-i\,a^2e^{(4i\,dx+4i\,c)}-2i\,a^2e^{(2i\,dx+2i\,c)}-i\,a^2\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}}{6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/6*sqrt(2)*(-I*a^2*e^(4*I*d*x + 4*I*c) - 2*I*a^2*e^(2*I*d*x + 2*I*c) - I*a
^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i a \tan (dx + c) + a)^{\frac{5}{2}} \cos (dx + c)^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(5/2)*cos(d*x + c)^3, x)
```

maple [B] time = 1.25, size = 63, normalized size = 1.80

$$-\frac{2 \left(i \cos \left(dx + c\right) - \sin \left(dx + c\right)\right) \left(\cos^2 \left(dx + c\right)\right) \sqrt{\frac{a(i \sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\, a^2}{3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] -2/3/d*(I*cos(d*x+c)-sin(d*x+c))*cos(d*x+c)^2*(a*(I*sin(d*x+c)+cos(d*x+c))/
cos(d*x+c))^(1/2)*a^2
```

maxima [B] time = 1.21, size = 328, normalized size = 9.37

$$\frac{2\left(i a^{\frac{5}{2}} - \frac{4 i a^{\frac{5}{2}} \sin(dx+c)^2}{(\cos(dx+c)+1)^2} + \frac{6 i a^{\frac{5}{2}} \sin(dx+c)^4}{(\cos(dx+c)+1)^4} - \frac{4 i a^{\frac{5}{2}} \sin(dx+c)^6}{(\cos(dx+c)+1)^6} + \frac{i a^{\frac{5}{2}} \sin(dx+c)^8}{(\cos(dx+c)+1)^8}\right)\left(-\frac{2 i \sin(dx+c)}{\cos(dx+c)+1} + \frac{\sin(dx+}{(\cos(dx+c}\right.}{d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1} + 1\right)^{\frac{5}{2}} \left(\frac{\sin(dx+c)}{\cos(dx+c)+1} - 1\right)^{\frac{5}{2}} \left(-\frac{6 i \sin(dx+c)}{\cos(dx+c)+1} - \frac{6 \sin(dx+c)^2}{(\cos(dx+c)+1)^2} - \frac{18 i \sin(dx+c)^3}{(\cos(dx+c)+1)^3} - \frac{18 i \sin(dx+c)^5}{(\cos(dx+c)+1)^5} + \frac{6 \sin(dx+c)^6}{(\cos(dx+c)+1)^6} - \right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] 2*(I*a^(5/2) - 4*I*a^(5/2)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 6*I*a^(5/2
)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 4*I*a^(5/2)*sin(d*x + c)^6/(cos(d*x
 + c) + 1)^6 + I*a^(5/2)*sin(d*x + c)^8/(cos(d*x + c) + 1)^8)*(-2*I*sin(d*x
 + c)/(cos(d*x + c) + 1) + sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 1)^(5/2)/(
d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(5/2)*(sin(d*x + c)/(cos(d*x + c) +
 1) - 1)^(5/2)*(-6*I*sin(d*x + c)/(cos(d*x + c) + 1) - 6*sin(d*x + c)^2/(co
s(d*x + c) + 1)^2 - 18*I*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 - 18*I*sin(d*x
 + c)^5/(cos(d*x + c) + 1)^5 + 6*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 - 6*I*
sin(d*x + c)^7/(cos(d*x + c) + 1)^7 + 3*sin(d*x + c)^8/(cos(d*x + c) + 1)^8
 - 3))
```

mupad [B] time = 0.91, size = 89, normalized size = 2.54

$$-\frac{a^2 \sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}\, \left(-\sin\left(c+d\,x\right)-\sin\left(3\,c+3\,d\,x\right)+\cos\left(c+d\,x\right)\,3\mathrm{i}+\cos\left(3\,c+3\,d\,x\right)\,1\mathrm{i}\right)}{6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^(5/2),x)
```

```
[Out] -(a^2*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) +
 1))^(1/2)*(cos(c + d*x)*3i - sin(c + d*x) + cos(3*c + 3*d*x)*1i - sin(3*c
+ 3*d*x)))/(6*d)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3*(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.317 $\int \cos^5(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx$

Optimal. Leaf size=159

$$\frac{ia^{5/2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{4\sqrt{2}\,d}-\frac{ia^2\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{4d}-\frac{i\cos^5(c+dx)(a+ia\tan(c+dx))^{5/2}}{5d}-\frac{ia\cos}{}$$

```
[Out] 1/8*I*a^(5/2)*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/
2))/d*2^(1/2)-1/4*I*a^2*cos(d*x+c)*(a+I*a*tan(d*x+c))^(1/2)/d-1/6*I*a*cos(d
*x+c)^3*(a+I*a*tan(d*x+c))^(3/2)/d-1/5*I*cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(5
/2)/d
```

Rubi [A] time = 0.22, antiderivative size = 159, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.115, Rules used = {3490, 3489, 206}

$$-\frac{ia^2\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{4d}+\frac{ia^{5/2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{4\sqrt{2}\,d}-\frac{i\cos^5(c+dx)(a+ia\tan(c+dx))^{5/2}}{5d}-\frac{ia\,c}{}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((I/4)*a^(5/2)*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[c +
 d*x]])])/(Sqrt[2]*d) - ((I/4)*a^2*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])
/d - ((I/6)*a*Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^(3/2))/d - ((I/5)*Cos[c
 + d*x]^5*(a + I*a*Tan[c + d*x])^(5/2))/d
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3490

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] + Dist[a/(2*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b*Tan[e +
f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] &&
EqQ[m/2 + n, 0] && GtQ[n, 0]
```

Rubi steps

$$\int \cos^5(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx = -\frac{i\cos^5(c+dx)(a+ia\tan(c+dx))^{5/2}}{5d} + \frac{1}{2}a\int \cos^3(c+dx)(a+ia\,\mathrm{t}$$
$$= -\frac{ia\cos^3(c+dx)(a+ia\tan(c+dx))^{3/2}}{6d} - \frac{i\cos^5(c+dx)(a+ia\tan(}{5d}$$
$$= -\frac{ia^2\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{4d} - \frac{ia\cos^3(c+dx)(a+ia\tan(c}{6d}$$
$$= -\frac{ia^2\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{4d} - \frac{ia\cos^3(c+dx)(a+ia\tan(c}{6d}$$
$$= \frac{ia^{5/2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{4\sqrt{2}d} - \frac{ia^2\cos(c+dx)\sqrt{a+ia\tan(c+d}{4d}$$

Mathematica [A] time = 1.12, size = 118, normalized size = 0.74

$$-\frac{ia^2e^{-i(c+dx)}\left(34e^{2i(c+dx)}+14e^{4i(c+dx)}+3e^{6i(c+dx)}-15\sqrt{1+e^{2i(c+dx)}}\tanh^{-1}\left(\sqrt{1+e^{2i(c+dx)}}\right)+23\right)\sqrt{a+ia\tan(}{120d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((-1/120*I)*a^2*(23 + 34*E^((2*I)*(c + d*x)) + 14*E^((4*I)*(c + d*x)) + 3*E
^((6*I)*(c + d*x)) - 15*Sqrt[1 + E^((2*I)*(c + d*x))]*ArcTanh[Sqrt[1 + E^((
2*I)*(c + d*x))]])*Sqrt[a + I*a*Tan[c + d*x]])/(d*E^(I*(c + d*x)))
```

fricas [B] time = 0.73, size = 244, normalized size = 1.53

$$\frac{15\sqrt{\frac{1}{2}}\sqrt{-\frac{a^5}{d^2}}\,d\log\left(\frac{\left(i\,a^3+\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{-\frac{a^5}{d^2}}\left(de^{(2i\,dx+2i\,c)}+d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\right)e^{(-i\,dx-i\,c)}}{2\,d}\right)-15\sqrt{\frac{1}{2}}\sqrt{-\frac{a^5}{d^2}}\,d\log\left(\frac{\left(i\,a^3-\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{-\frac{a^5}{d^2}}\left(de\right.\right.}{}\right.}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/120*(15*sqrt(1/2)*sqrt(-a^5/d^2)*d*log(1/2*(I*a^3 + sqrt(2)*sqrt(1/2)*sqr
t(-a^5/d^2)*(d*e^(2*I*d*x + 2*I*c) + d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)))*
e^(-I*d*x - I*c)/d) - 15*sqrt(1/2)*sqrt(-a^5/d^2)*d*log(1/2*(I*a^3 - sqrt(2
)*sqrt(1/2)*sqrt(-a^5/d^2)*(d*e^(2*I*d*x + 2*I*c) + d)*sqrt(a/(e^(2*I*d*x +
 2*I*c) + 1)))*e^(-I*d*x - I*c)/d) + sqrt(2)*(-3*I*a^2*e^(6*I*d*x + 6*I*c)
- 14*I*a^2*e^(4*I*d*x + 4*I*c) - 34*I*a^2*e^(2*I*d*x + 2*I*c) - 23*I*a^2)*s
qrt(a/(e^(2*I*d*x + 2*I*c) + 1)))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{5}{2}}\cos(dx+c)^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(5/2)*cos(d*x + c)^5, x)
```

maple [B] time = 1.46, size = 916, normalized size = 5.76

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] -1/1920/d*(-768*I*cos(d*x+c)^9+64*I*cos(d*x+c)^7-15*cos(d*x+c)^4*sin(d*x+c)
*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(9/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)*2^(1/2))*2^(1/2)+60*I*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))
^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(9/2)*
2^(1/2)*sin(d*x+c)*cos(d*x+c)-60*cos(d*x+c)^3*sin(d*x+c)*(-2*cos(d*x+c)/(1+
cos(d*x+c)))^(9/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))
*2^(1/2)+90*I*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/c
os(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(9/2)*2^(1/2)*sin(d*x+c)*
cos(d*x+c)^2-90*cos(d*x+c)^2*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(9/2
)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)+160*I*co
s(d*x+c)^6-60*cos(d*x+c)*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(9/2)*ar
ctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)-15*arctan(1/
2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c
)))^(9/2)*2^(1/2)*sin(d*x+c)+15*I*2^(1/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)
))^(9/2)*sin(d*x+c)-480*I*cos(d*x+c)^5-1536*sin(d*x+c)*cos(d*x+c)^9+60*I*ar
ctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2
))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(9/2)*2^(1/2)*sin(d*x+c)*cos(d*x+c)^3+768
*sin(d*x+c)*cos(d*x+c)^8-512*I*cos(d*x+c)^8-256*sin(d*x+c)*cos(d*x+c)^7+153
6*I*cos(d*x+c)^10+320*sin(d*x+c)*cos(d*x+c)^6+15*I*arctanh(1/2*(-2*cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+c
os(d*x+c)))^(9/2)*2^(1/2)*sin(d*x+c)*cos(d*x+c)^4-480*cos(d*x+c)^5*sin(d*x+
c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/(I*sin(d*x+c)+cos(d*x+c)
-1)/cos(d*x+c)^4*a^2
```

maxima [B] time = 1.10, size = 1075, normalized size = 6.76

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] -1/480*(20*(I*sqrt(2)*a^2*cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c
) + 1)) - sqrt(2)*a^2*sin(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) +
1)))*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(3/
4)*sqrt(a) - (-60*I*sqrt(2)*a^2*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c) + 1)) + 60*sqrt(2)*a^2*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c) + 1)) + (-12*I*sqrt(2)*a^2*cos(2*d*x + 2*c)^2 - 12*I*sqrt(2)*a^2*sin
(2*d*x + 2*c)^2 - 24*I*sqrt(2)*a^2*cos(2*d*x + 2*c) - 12*I*sqrt(2)*a^2)*cos
(5/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 12*(sqrt(2)*a^2*cos
(2*d*x + 2*c)^2 + sqrt(2)*a^2*sin(2*d*x + 2*c)^2 + 2*sqrt(2)*a^2*cos(2*d*x
+ 2*c) + sqrt(2)*a^2)*sin(5/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) +
1)))*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/
4)*sqrt(a) + (30*sqrt(2)*a^2*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)
^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*
d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x +
2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) +
1) - 30*sqrt(2)*a^2*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*co
s(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c
) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)
^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 1) - 15*I
*sqrt(2)*a^2*log(sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x
 + 2*c) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + s
qrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*sin(1
/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + 2*(cos(2*d*x + 2*c)
^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin
```

```
(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1) + 15*I*sqrt(2)*a^2*log(sqrt(cos(
2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*cos(1/2*arcta
n2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + sqrt(cos(2*d*x + 2*c)^2 + s
in(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*sin(1/2*arctan2(sin(2*d*x + 2*c
), cos(2*d*x + 2*c) + 1))^2 - 2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 +
2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
 2*c) + 1)) + 1))*sqrt(a))/d
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \cos(c+d\,x)^5\,(a+a\tan(c+d\,x)\,1\mathrm{i})^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^(5/2),x)
```

```
[Out] int(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**5*(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.318 $\int \cos^7(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx$

Optimal. Leaf size=231

$$\frac{9ia^{5/2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{32\sqrt{2}\,d}+\frac{3ia^3\cos(c+dx)}{16d\sqrt{a+ia\tan(c+dx)}}-\frac{3ia^2\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{20d}-\frac{9ia^2\cos(c+d}{}$$

```
[Out] 9/64*I*a^(5/2)*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1
/2))/d*2^(1/2)+3/16*I*a^3*cos(d*x+c)/d/(a+I*a*tan(d*x+c))^(1/2)-9/32*I*a^2*
cos(d*x+c)*(a+I*a*tan(d*x+c))^(1/2)/d-3/20*I*a^2*cos(d*x+c)^3*(a+I*a*tan(d*
x+c))^(1/2)/d-9/70*I*a*cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(3/2)/d-1/7*I*cos(d*
x+c)^7*(a+I*a*tan(d*x+c))^(5/2)/d
```

Rubi [A] time = 0.34, antiderivative size = 231, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {3497, 3502, 3490, 3489, 206}

$$-\frac{3ia^2\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{20d}-\frac{9ia^2\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{32d}+\frac{3ia^3\cos(c+dx)}{16d\sqrt{a+ia\tan(c+dx)}}+\frac{9ia^{5/2}\text{ta}}{}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^7*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((9*I)/32)*a^(5/2)*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Ta
n[c + d*x]])])/(Sqrt[2]*d) + (((3*I)/16)*a^3*Cos[c + d*x])/(d*Sqrt[a + I*a*
Tan[c + d*x]]) - (((9*I)/32)*a^2*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])/d
 - (((3*I)/20)*a^2*Cos[c + d*x]^3*Sqrt[a + I*a*Tan[c + d*x]])/d - (((9*I)/7
0)*a*Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^(3/2))/d - ((I/7)*Cos[c + d*x]^7
*(a + I*a*Tan[c + d*x])^(5/2))/d
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3490

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] + Dist[a/(2*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b*Tan[e +
f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] &&
EqQ[m/2 + n, 0] && GtQ[n, 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \cos^7(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx = -\frac{i\cos^7(c+dx)(a+ia\tan(c+dx))^{5/2}}{7d}+\frac{1}{14}(9a)\int \cos^5(c+dx)(a+$$

$$= -\frac{9ia\cos^5(c+dx)(a+ia\tan(c+dx))^{3/2}}{70d}-\frac{i\cos^7(c+dx)(a+ia\tan$$

$$= -\frac{3ia^2\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{20d}-\frac{9ia\cos^5(c+dx)(a+ia\tan$$

$$= \frac{3ia^3\cos(c+dx)}{16d\sqrt{a+ia\tan(c+dx)}}-\frac{3ia^2\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{20d}-$$

$$= \frac{3ia^3\cos(c+dx)}{16d\sqrt{a+ia\tan(c+dx)}}-\frac{9ia^2\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{32d}-$$

$$= \frac{3ia^3\cos(c+dx)}{16d\sqrt{a+ia\tan(c+dx)}}-\frac{9ia^2\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{32d}-$$

$$= \frac{9ia^{5/2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{32\sqrt{2}\,d}+\frac{3ia^3\cos(c+dx)}{16d\sqrt{a+ia\tan(c+dx)}}-\frac{9ia^2}{}$$

Mathematica [A] time = 1.25, size = 155, normalized size = 0.67

$$-\frac{ia^2e^{-3i(c+dx)}\left(353e^{2i(c+dx)}+544e^{4i(c+dx)}+214e^{6i(c+dx)}+68e^{8i(c+dx)}+10e^{10i(c+dx)}-315e^{2i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\,\text{ta}\right.}{2240d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^7*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((-1/2240*I)*a^2*(-35 + 353*E^((2*I)*(c + d*x)) + 544*E^((4*I)*(c + d*x)) +
 214*E^((6*I)*(c + d*x)) + 68*E^((8*I)*(c + d*x)) + 10*E^((10*I)*(c + d*x))
 - 315*E^((2*I)*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))]*ArcTanh[Sqrt[1 + E
^((2*I)*(c + d*x))]])*Sqrt[a + I*a*Tan[c + d*x]])/(d*E^((3*I)*(c + d*x)))
```

fricas [A] time = 2.23, size = 300, normalized size = 1.30

$$-\frac{\left(315\sqrt{\frac{1}{2}}\sqrt{-\frac{a^5}{d^2}}\,de^{(2i\,dx+2i\,c)}\log\left(-\frac{9\left(-i\,a^3+\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{-\frac{a^5}{d^2}}\left(de^{(2i\,dx+2i\,c)}+d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\right)e^{(-i\,dx-i\,c)}}{16\,d}\right)-315\sqrt{\frac{1}{2}}\sqrt{-\frac{a^5}{d^2}}\,de^{(2i\,dx}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] -1/2240*(315*sqrt(1/2)*sqrt(-a^5/d^2)*d*e^(2*I*d*x + 2*I*c)*log(-9/16*(-I*a
^3 + sqrt(2)*sqrt(1/2)*sqrt(-a^5/d^2)*(d*e^(2*I*d*x + 2*I*c) + d)*sqrt(a/(e
```

```
^(2*I*d*x + 2*I*c) + 1)))*e^(-I*d*x - I*c)/d) - 315*sqrt(1/2)*sqrt(-a^5/d^2
)*d*e^(2*I*d*x + 2*I*c)*log(-9/16*(-I*a^3 - sqrt(2)*sqrt(1/2)*sqrt(-a^5/d^2
)*(d*e^(2*I*d*x + 2*I*c) + d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)))*e^(-I*d*x
- I*c)/d) - sqrt(2)*(-10*I*a^2*e^(10*I*d*x + 10*I*c) - 68*I*a^2*e^(8*I*d*x
+ 8*I*c) - 214*I*a^2*e^(6*I*d*x + 6*I*c) - 544*I*a^2*e^(4*I*d*x + 4*I*c) -
353*I*a^2*e^(2*I*d*x + 2*I*c) + 35*I*a^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))
)*e^(-2*I*d*x - 2*I*c)/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{5}{2}}\cos(dx+c)^7\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(5/2)*cos(d*x + c)^7, x)
```

maple [B] time = 1.85, size = 1260, normalized size = 5.45

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] -1/143360/d*(315*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(13/2)*arctanh(1/2*(-2*co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*sin(d*x+c)*co
s(d*x+c)^6*2^(1/2)+1890*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(13/2)*arctanh(1/2
*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*sin(d*
x+c)*cos(d*x+c)^5*2^(1/2)-16384*sin(d*x+c)*cos(d*x+c)^11-21504*sin(d*x+c)*c
os(d*x+c)^9+26880*sin(d*x+c)*cos(d*x+c)^8+18432*sin(d*x+c)*cos(d*x+c)^10-40
320*sin(d*x+c)*cos(d*x+c)^7-81920*sin(d*x+c)*cos(d*x+c)^13+40960*sin(d*x+c)
*cos(d*x+c)^12+81920*I*cos(d*x+c)^14-40960*I*cos(d*x+c)^13-24576*I*cos(d*x+
c)^12+2048*I*cos(d*x+c)^11+5376*I*cos(d*x+c)^9+13440*I*cos(d*x+c)^8-40320*I
*cos(d*x+c)^7-315*2^(1/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2
^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(13/2)*sin(d*x+c)+3072*I*cos(d*x+c)^
10+1890*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(13/2)*arctanh(1/2*(-2*cos(d*x+c)/
(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*sin(d*x+c)*cos(d*x+c)*
2^(1/2)+315*I*2^(1/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(
d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(13/2)*sin(d*x+c)
-315*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(13/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*2^(1/2))*sin(d*x+c)*cos(d*x+c)^6*2^(1/2)-1890*(-2*cos(d*x+c
)/(1+cos(d*x+c)))^(13/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^
(1/2))*sin(d*x+c)*cos(d*x+c)^5*2^(1/2)-4725*(-2*cos(d*x+c)/(1+cos(d*x+c)))^
(13/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*sin(d*x+c)*
cos(d*x+c)^4*2^(1/2)-6300*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(13/2)*arctan(1/2*
(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*sin(d*x+c)*cos(d*x+c)^3*2^(1/
2)-4725*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(13/2)*arctan(1/2*(-2*cos(d*x+c)/(1+
cos(d*x+c)))^(1/2)*2^(1/2))*sin(d*x+c)*cos(d*x+c)^2*2^(1/2)-1890*(-2*cos(d*
x+c)/(1+cos(d*x+c)))^(13/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*2^(1/2))*sin(d*x+c)*cos(d*x+c)*2^(1/2)+4725*I*(-2*cos(d*x+c)/(1+cos(d*x+c)
))^(13/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d
*x+c)*2^(1/2))*sin(d*x+c)*cos(d*x+c)^4*2^(1/2)+6300*I*(-2*cos(d*x+c)/(1+cos
(d*x+c)))^(13/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c
)/cos(d*x+c)*2^(1/2))*sin(d*x+c)*cos(d*x+c)^3*2^(1/2)+4725*I*(-2*cos(d*x+c)
/(1+cos(d*x+c)))^(13/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*si
n(d*x+c)/cos(d*x+c)*2^(1/2))*sin(d*x+c)*cos(d*x+c)^2*2^(1/2))*(a*(I*sin(d*x
+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/(I*sin(d*x+c)+cos(d*x+c)-1)/cos(d*x+c)^6*
a^2
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \cos\left(c+d\,x\right)^7\,{\left(a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^7*(a + a*tan(c + d*x)*1i)^(5/2),x)
[Out] int(cos(c + d*x)^7*(a + a*tan(c + d*x)*1i)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**7*(a+I*a*tan(d*x+c))**(5/2),x)
[Out] Timed out
```

3.319 $\int \sec^8(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx$

Optimal. Leaf size=117

$$\frac{2i(a+ia\tan(c+dx))^{21/2}}{21a^7d}-\frac{12i(a+ia\tan(c+dx))^{19/2}}{19a^6d}+\frac{24i(a+ia\tan(c+dx))^{17/2}}{17a^5d}-\frac{16i(a+ia\tan(c+dx))^{15/2}}{15a^4d}$$

```
[Out] -16/15*I*(a+I*a*tan(d*x+c))^(15/2)/a^4/d+24/17*I*(a+I*a*tan(d*x+c))^(17/2)/
a^5/d-12/19*I*(a+I*a*tan(d*x+c))^(19/2)/a^6/d+2/21*I*(a+I*a*tan(d*x+c))^(21
/2)/a^7/d
```

Rubi [A] time = 0.08, antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = $\{3487, 43\}$

$$\frac{2i(a+ia\tan(c+dx))^{21/2}}{21a^7d}-\frac{12i(a+ia\tan(c+dx))^{19/2}}{19a^6d}+\frac{24i(a+ia\tan(c+dx))^{17/2}}{17a^5d}-\frac{16i(a+ia\tan(c+dx))^{15/2}}{15a^4d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^8*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((-16*I)/15)*(a + I*a*Tan[c + d*x])^(15/2))/(a^4*d) + (((24*I)/17)*(a + I*
a*Tan[c + d*x])^(17/2))/(a^5*d) - (((12*I)/19)*(a + I*a*Tan[c + d*x])^(19/2
))/(a^6*d) + (((2*I)/21)*(a + I*a*Tan[c + d*x])^(21/2))/(a^7*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^8(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^3(a+x)^{13/2}\,dx,x,ia\tan(c+dx)\right)}{a^7d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(8a^3(a+x)^{13/2}-12a^2(a+x)^{15/2}+6a(a+x)^{17/2}-(a+x)\right.\right.}{a^7d}\\ &= -\frac{16i(a+ia\tan(c+dx))^{15/2}}{15a^4d}+\frac{24i(a+ia\tan(c+dx))^{17/2}}{17a^5d}-\frac{12i(a+ia}{}\end{aligned}$$

Mathematica [A] time = 1.85, size = 113, normalized size = 0.97

$$-\frac{2a^3\sec^9(c+dx)\sqrt{a+ia\tan(c+dx)}\,(\cos(7c+10dx)+i\sin(7c+10dx))(4554i\cos(2(c+dx))+630\tan(c+dx)}{33915d(\cos(dx)+i\sin(dx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^8*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (-2*a^3*Sec[c + d*x]^9*(Cos[7*c + 10*d*x] + I*Sin[7*c + 10*d*x])*(-1311*I +
 (4554*I)*Cos[2*(c + d*x)] + 2245*Sec[c + d*x]*Sin[3*(c + d*x)] + 630*Tan[c
 + d*x])*Sqrt[a + I*a*Tan[c + d*x]])/(33915*d*(Cos[d*x] + I*Sin[d*x])^3)
```

fricas [B] time = 0.91, size = 202, normalized size = 1.73

$$\frac{\sqrt{2}\left(-32768i\,a^3e^{(21i\,dx+21i\,c)} - 344064i\,a^3e^{(19i\,dx+19i\,c)} - 1634304i\,a^3e^{(17i\,dx+1}\right.}{33915\left(de^{(20i\,dx+20i\,c)} + 10\,de^{(18i\,dx+18i\,c)} + 45\,de^{(16i\,dx+16i\,c)} + 120\,de^{(14i\,dx+14i\,c)} + 210\,de^{(12i\,dx+12i\,c)} + 252\,de^{(10i\,dx}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/33915*sqrt(2)*(-32768*I*a^3*e^(21*I*d*x + 21*I*c) - 344064*I*a^3*e^(19*I*
d*x + 19*I*c) - 1634304*I*a^3*e^(17*I*d*x + 17*I*c) - 4630528*I*a^3*e^(15*I
*d*x + 15*I*c))*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))/(d*e^(20*I*d*x + 20*I*c)
+ 10*d*e^(18*I*d*x + 18*I*c) + 45*d*e^(16*I*d*x + 16*I*c) + 120*d*e^(14*I*d
*x + 14*I*c) + 210*d*e^(12*I*d*x + 12*I*c) + 252*d*e^(10*I*d*x + 10*I*c) +
210*d*e^(8*I*d*x + 8*I*c) + 120*d*e^(6*I*d*x + 6*I*c) + 45*d*e^(4*I*d*x + 4
*I*c) + 10*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{7}{2}}\sec(dx+c)^8\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(7/2)*sec(d*x + c)^8, x)
```

maple [A] time = 56.57, size = 181, normalized size = 1.55

$$2\left(-8192i\left(\cos^{10}(dx+c)\right) + 8192\sin(dx+c)\left(\cos^{9}(dx+c)\right) - 1024i\left(\cos^{8}(dx+c)\right) + 5120\sin(dx+c)\left(\cos^{7}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] 2/33915/d*(-8192*I*cos(d*x+c)^10+8192*sin(d*x+c)*cos(d*x+c)^9-1024*I*cos(d*
x+c)^8+5120*sin(d*x+c)*cos(d*x+c)^7-448*I*cos(d*x+c)^6+4032*cos(d*x+c)^5*si
n(d*x+c)-264*I*cos(d*x+c)^4+3432*cos(d*x+c)^3*sin(d*x+c)+8300*I*cos(d*x+c)^
2-5440*cos(d*x+c)*sin(d*x+c)-1615*I)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c
))^(1/2)/cos(d*x+c)^10*a^3
```

maxima [A] time = 0.33, size = 76, normalized size = 0.65

$$\frac{2i\left(1615\,(i\,a\tan(dx+c)+a)^{\frac{21}{2}} - 10710\,(i\,a\tan(dx+c)+a)^{\frac{19}{2}}a + 23940\,(i\,a\tan(dx+c)+a)^{\frac{17}{2}}a^2 - 18088\,(i\,a\right.}{33915\,a^7d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] 2/33915*I*(1615*(I*a*tan(d*x + c) + a)^(21/2) - 10710*(I*a*tan(d*x + c) + a
)^(19/2)*a + 23940*(I*a*tan(d*x + c) + a)^(17/2)*a^2 - 18088*(I*a*tan(d*x +
 c) + a)^(15/2)*a^3)/(a^7*d)
```

mupad [B] time = 15.04, size = 690, normalized size = 5.90

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(7/2)/cos(c + d*x)^8,x)
```

```
[Out] (a^3*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/
2)*247808i)/(969*d*(exp(c*2i + d*x*2i) + 1)^4) - (a^3*(a - (a*(exp(c*2i + d
*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*16384i)/(33915*d*(exp(c
*2i + d*x*2i) + 1)) - (a^3*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*
2i + d*x*2i) + 1))^(1/2)*4096i)/(11305*d*(exp(c*2i + d*x*2i) + 1)^2) - (a^3
*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*2
048i)/(6783*d*(exp(c*2i + d*x*2i) + 1)^3) - (a^3*(a - (a*(exp(c*2i + d*x*2i
)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*32768i)/(33915*d) - (a^3*(a
- (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*19435
52i)/(1615*d*(exp(c*2i + d*x*2i) + 1)^5) + (a^3*(a - (a*(exp(c*2i + d*x*2i)
*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*12019712i)/(4845*d*(exp(c*2i
+ d*x*2i) + 1)^6) - (a^3*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i
 + d*x*2i) + 1))^(1/2)*95516672i)/(33915*d*(exp(c*2i + d*x*2i) + 1)^7) + (a
^3*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)
*4159488i)/(2261*d*(exp(c*2i + d*x*2i) + 1)^8) - (a^3*(a - (a*(exp(c*2i + d
*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*260096i)/(399*d*(exp(c*
2i + d*x*2i) + 1)^9) + (a^3*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c
*2i + d*x*2i) + 1))^(1/2)*2048i)/(21*d*(exp(c*2i + d*x*2i) + 1)^10)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8*(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.320 $\int \sec^6(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx$

Optimal. Leaf size=88

$$-\frac{2i(a+ia\tan(c+dx))^{17/2}}{17a^5d}+\frac{8i(a+ia\tan(c+dx))^{15/2}}{15a^4d}-\frac{8i(a+ia\tan(c+dx))^{13/2}}{13a^3d}$$

```
[Out] -8/13*I*(a+I*a*tan(d*x+c))^(13/2)/a^3/d+8/15*I*(a+I*a*tan(d*x+c))^(15/2)/a^
4/d-2/17*I*(a+I*a*tan(d*x+c))^(17/2)/a^5/d
```

Rubi [A] time = 0.08, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 43}

$$-\frac{2i(a+ia\tan(c+dx))^{17/2}}{17a^5d}+\frac{8i(a+ia\tan(c+dx))^{15/2}}{15a^4d}-\frac{8i(a+ia\tan(c+dx))^{13/2}}{13a^3d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((-8*I)/13)*(a + I*a*Tan[c + d*x])^(13/2))/(a^3*d) + (((8*I)/15)*(a + I*a*
Tan[c + d*x])^(15/2))/(a^4*d) - (((2*I)/17)*(a + I*a*Tan[c + d*x])^(17/2))/
(a^5*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^6(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^2(a+x)^{11/2}\,dx,x,ia\tan(c+dx)\right)}{a^5d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(4a^2(a+x)^{11/2}-4a(a+x)^{13/2}+(a+x)^{15/2}\right)dx,x,ia\,\text{ta}\right.}{a^5d}\\ &= -\frac{8i(a+ia\tan(c+dx))^{13/2}}{13a^3d}+\frac{8i(a+ia\tan(c+dx))^{15/2}}{15a^4d}-\frac{2i(a+ia}{}\end{aligned}$$

Mathematica [A] time = 0.95, size = 97, normalized size = 1.10

$$\frac{2a^3\sec^8(c+dx)\sqrt{a+ia\tan(c+dx)}\,(-247i\sin(2(c+dx))+263\cos(2(c+dx))+68)(\sin(6c+9dx)-i\cos(6c}{3315d(\cos(dx)+i\sin(dx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (2*a^3*Sec[c + d*x]^8*(68 + 263*Cos[2*(c + d*x)] - (247*I)*Sin[2*(c + d*x)]
)*((-I)*Cos[6*c + 9*d*x] + Sin[6*c + 9*d*x])*Sqrt[a + I*a*Tan[c + d*x]])/(3
315*d*(Cos[d*x] + I*Sin[d*x])^3)
```

fricas [B] time = 2.80, size = 164, normalized size = 1.86

$$\frac{\sqrt{2}\left(-4096i\,a^3e^{(17i\,dx+17i\,c)} - 34816i\,a^3e^{(15i\,dx+15i\,c)} - 130560i\,a^3e^{(13i\,dx+13i\,c)}\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+ \cdots}}}{3315\left(de^{(16i\,dx+16i\,c)} + 8\,de^{(14i\,dx+14i\,c)} + 28\,de^{(12i\,dx+12i\,c)} + 56\,de^{(10i\,dx+10i\,c)} + 70\,de^{(8i\,dx+8i\,c)} + 56\,de^{(6i\,dx+6i\,c)} + 28\,de \cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/3315*sqrt(2)*(-4096*I*a^3*e^(17*I*d*x + 17*I*c) - 34816*I*a^3*e^(15*I*d*x
 + 15*I*c) - 130560*I*a^3*e^(13*I*d*x + 13*I*c))*sqrt(a/(e^(2*I*d*x + 2*I*c
) + 1))/(d*e^(16*I*d*x + 16*I*c) + 8*d*e^(14*I*d*x + 14*I*c) + 28*d*e^(12*I
*d*x + 12*I*c) + 56*d*e^(10*I*d*x + 10*I*c) + 70*d*e^(8*I*d*x + 8*I*c) + 56
*d*e^(6*I*d*x + 6*I*c) + 28*d*e^(4*I*d*x + 4*I*c) + 8*d*e^(2*I*d*x + 2*I*c)
 + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{7}{2}}\sec(dx+c)^6\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(7/2)*sec(d*x + c)^6, x)
```

maple [B] time = 6.77, size = 154, normalized size = 1.75

$$-\frac{2\left(1024i\left(\cos^8(dx+c)\right) - 1024\sin(dx+c)\left(\cos^7(dx+c)\right) + 128i\left(\cos^6(dx+c)\right) - 640\left(\cos^5(dx+c)\right)\sin(dx \cdots\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] -2/3315/d*(1024*I*cos(d*x+c)^8-1024*sin(d*x+c)*cos(d*x+c)^7+128*I*cos(d*x+c
)^6-640*cos(d*x+c)^5*sin(d*x+c)+56*I*cos(d*x+c)^4-504*cos(d*x+c)^3*sin(d*x+
c)-1072*I*cos(d*x+c)^2+676*cos(d*x+c)*sin(d*x+c)+195*I)*(a*(I*sin(d*x+c)+co
s(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^8*a^3
```

maxima [A] time = 0.67, size = 58, normalized size = 0.66

$$-\frac{2i\left(195\,(i\,a\tan(dx+c)+a)^{\frac{17}{2}} - 884\,(i\,a\tan(dx+c)+a)^{\frac{15}{2}}a + 1020\,(i\,a\tan(dx+c)+a)^{\frac{13}{2}}a^2\right)}{3315\,a^5d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] -2/3315*I*(195*(I*a*tan(d*x + c) + a)^(17/2) - 884*(I*a*tan(d*x + c) + a)^(
15/2)*a + 1020*(I*a*tan(d*x + c) + a)^(13/2)*a^2)/(a^5*d)
```

mupad [B] time = 15.66, size = 562, normalized size = 6.39

$$-\frac{a^3\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\;4096i}{3315\,d}-\frac{a^3\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\;2048i}{3315\,d\left(e^{c\,2i+d\,x\,2i}+1\right)}-\frac{a^3\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\;512i}{1105\,d\left(e^{c\,2i+d\,x\,2i}+1\right)^2}+\frac{a^3\sqrt{a-\frac{a\left(e^{c\,2i \cdots}\right.}{e^{c \cdots}}}}{663\,d\left(e^{c \cdots}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a + a*tan(c + d*x)*1i)^(7/2)/cos(c + d*x)^6,x)

[Out] (a^3*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/
2)*56320i)/(663*d*(exp(c*2i + d*x*2i) + 1)^3) - (a^3*(a - (a*(exp(c*2i + d*
x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*2048i)/(3315*d*(exp(c*2i
 + d*x*2i) + 1)) - (a^3*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i
+ d*x*2i) + 1))^(1/2)*512i)/(1105*d*(exp(c*2i + d*x*2i) + 1)^2) - (a^3*(a -
 (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*4096i)
/(3315*d) - (a^3*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2
i) + 1))^(1/2)*205312i)/(663*d*(exp(c*2i + d*x*2i) + 1)^4) + (a^3*(a - (a*(
exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*540672i)/(1
105*d*(exp(c*2i + d*x*2i) + 1)^5) - (a^3*(a - (a*(exp(c*2i + d*x*2i)*1i - 1
i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*1341952i)/(3315*d*(exp(c*2i + d*x*2i
) + 1)^6) + (a^3*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2
i) + 1))^(1/2)*44032i)/(255*d*(exp(c*2i + d*x*2i) + 1)^7) - (a^3*(a - (a*(e
xp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*512i)/(17*d*
(exp(c*2i + d*x*2i) + 1)^8)

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sec(d*x+c)**6*(a+I*a*tan(d*x+c))**(7/2),x)

[Out] Timed out

3.321 $\int \sec^4(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx$

Optimal. Leaf size=59

$$\frac{2i(a+ia\tan(c+dx))^{13/2}}{13a^3d}-\frac{4i(a+ia\tan(c+dx))^{11/2}}{11a^2d}$$

```
[Out] -4/11*I*(a+I*a*tan(d*x+c))^(11/2)/a^2/d+2/13*I*(a+I*a*tan(d*x+c))^(13/2)/a^
3/d
```

Rubi [A] time = 0.07, antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = $\{3487, 43\}$

$$\frac{2i(a+ia\tan(c+dx))^{13/2}}{13a^3d}-\frac{4i(a+ia\tan(c+dx))^{11/2}}{11a^2d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((-4*I)/11)*(a + I*a*Tan[c + d*x])^(11/2))/(a^2*d) + (((2*I)/13)*(a + I*a*
Tan[c + d*x])^(13/2))/(a^3*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^4(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)(a+x)^{9/2}\,dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(2a(a+x)^{9/2}-(a+x)^{11/2}\right)dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{4i(a+ia\tan(c+dx))^{11/2}}{11a^2d}+\frac{2i(a+ia\tan(c+dx))^{13/2}}{13a^3d}\end{aligned}$$

Mathematica [A] time = 0.80, size = 85, normalized size = 1.44

$$-\frac{2a^3(11\tan(c+dx)+15i)\sec^5(c+dx)\sqrt{a+ia\tan(c+dx)}\,(\cos(5c+8dx)+i\sin(5c+8dx))}{143d(\cos(dx)+i\sin(dx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (-2*a^3*Sec[c + d*x]^5*(Cos[5*c + 8*d*x] + I*Sin[5*c + 8*d*x])*(15*I + 11*T
an[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])/(143*d*(Cos[d*x] + I*Sin[d*x])^3)
```

fricas [B] time = 0.47, size = 126, normalized size = 2.14

$$\frac{\sqrt{2}\left(-256i\,a^3e^{(13i\,dx+13i\,c)}-1664i\,a^3e^{(11i\,dx+11i\,c)}\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}}{143\left(de^{(12i\,dx+12i\,c)}+6\,de^{(10i\,dx+10i\,c)}+15\,de^{(8i\,dx+8i\,c)}+20\,de^{(6i\,dx+6i\,c)}+15\,de^{(4i\,dx+4i\,c)}+6\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/143*sqrt(2)*(-256*I*a^3*e^(13*I*d*x + 13*I*c) - 1664*I*a^3*e^(11*I*d*x +
11*I*c))*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))/(d*e^(12*I*d*x + 12*I*c) + 6*d*e
^(10*I*d*x + 10*I*c) + 15*d*e^(8*I*d*x + 8*I*c) + 20*d*e^(6*I*d*x + 6*I*c)
+ 15*d*e^(4*I*d*x + 4*I*c) + 6*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{7}{2}}\sec(dx+c)^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(7/2)*sec(d*x + c)^4, x)
```

maple [B] time = 1.67, size = 127, normalized size = 2.15

$$-\frac{2\left(64i\left(\cos^6(dx+c)\right)-64\left(\cos^5(dx+c)\right)\sin(dx+c)+8i\left(\cos^4(dx+c)\right)-40\left(\cos^3(dx+c)\right)\sin(dx+c)-\right.}{143d\cos(dx+c)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] -2/143/d*(64*I*cos(d*x+c)^6-64*cos(d*x+c)^5*sin(d*x+c)+8*I*cos(d*x+c)^4-40*
cos(d*x+c)^3*sin(d*x+c)-68*I*cos(d*x+c)^2+40*cos(d*x+c)*sin(d*x+c)+11*I)*(a
*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^6*a^3
```

maxima [A] time = 0.67, size = 40, normalized size = 0.68

$$\frac{2i\left(11\,(i\,a\tan(dx+c)+a)^{\frac{13}{2}}-26\,(i\,a\tan(dx+c)+a)^{\frac{11}{2}}a\right)}{143\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] 2/143*I*(11*(I*a*tan(d*x + c) + a)^(13/2) - 26*(I*a*tan(d*x + c) + a)^(11/2
)*a)/(a^3*d)
```

mupad [B] time = 7.57, size = 434, normalized size = 7.36

$$-\frac{a^3\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,256i}{143\,d}-\frac{a^3\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,128i}{143\,d\left(e^{c\,2i+d\,x\,2i}+1\right)}+\frac{a^3\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,4480i}{143\,d\left(e^{c\,2i+d\,x\,2i}+1\right)^2}-\frac{a^3\sqrt{a-\frac{a\,(e}{}}}{143\,d\,(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(7/2)/cos(c + d*x)^4,x)
```

```
[Out] (a^3*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/
2)*4480i)/(143*d*(exp(c*2i + d*x*2i) + 1)^2) - (a^3*(a - (a*(exp(c*2i + d*x
*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*128i)/(143*d*(exp(c*2i +
d*x*2i) + 1)) - (a^3*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d
*x*2i) + 1))^(1/2)*256i)/(143*d) - (a^3*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i
)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*11520i)/(143*d*(exp(c*2i + d*x*2i) +
1)^3) + (a^3*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) +
 1))^(1/2)*12800i)/(143*d*(exp(c*2i + d*x*2i) + 1)^4) - (a^3*(a - (a*(exp(c
*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*6784i)/(143*d*(e
xp(c*2i + d*x*2i) + 1)^5) + (a^3*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(
exp(c*2i + d*x*2i) + 1))^(1/2)*128i)/(13*d*(exp(c*2i + d*x*2i) + 1)^6)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4*(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.322 $\int \sec^2(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx$

Optimal. Leaf size=29

$$-\frac{2i(a+ia\tan(c+dx))^{9/2}}{9ad}$$

```
[Out] -2/9*I*(a+I*a*tan(d*x+c))^(9/2)/a/d
```

Rubi [A] time = 0.06, antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = $\{3487, 32\}$

$$-\frac{2i(a+ia\tan(c+dx))^{9/2}}{9ad}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((-2*I)/9)*(a + I*a*Tan[c + d*x])^(9/2))/(a*d)
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^2(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx &= -\frac{i\,\text{Subst}\left(\int (a+x)^{7/2}\,dx, x, ia\tan(c+dx)\right)}{ad}\\ &= -\frac{2i(a+ia\tan(c+dx))^{9/2}}{9ad}\end{aligned}$$

Mathematica [B] time = 0.47, size = 73, normalized size = 2.52

$$\frac{2a^3\sec^4(c+dx)\sqrt{a+ia\tan(c+dx)}\,(\sin(4c+7dx)-i\cos(4c+7dx))}{9d(\cos(dx)+i\sin(dx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (2*a^3*Sec[c + d*x]^4*((-I)*Cos[4*c + 7*d*x] + Sin[4*c + 7*d*x])*Sqrt[a + I
*a*Tan[c + d*x]])/(9*d*(Cos[d*x] + I*Sin[d*x])^3)
```

fricas [B] time = 0.46, size = 85, normalized size = 2.93

$$-\frac{32i\sqrt{2}\,a^3\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\,e^{(9i\,dx+9i\,c)}}{9\left(de^{(8i\,dx+8i\,c)}+4\,de^{(6i\,dx+6i\,c)}+6\,de^{(4i\,dx+4i\,c)}+4\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] -32/9*I*sqrt(2)*a^3*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(9*I*d*x + 9*I*c)/(
d*e^(8*I*d*x + 8*I*c) + 4*d*e^(6*I*d*x + 6*I*c) + 6*d*e^(4*I*d*x + 4*I*c) +
 4*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{7}{2}}\sec(dx+c)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(7/2)*sec(d*x + c)^2, x)
```

maple [A] time = 0.18, size = 24, normalized size = 0.83

$$-\frac{2i\,(a+ia\tan(dx+c))^{\frac{9}{2}}}{9da}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] -2/9*I*(a+I*a*tan(d*x+c))^(9/2)/d/a
```

maxima [A] time = 0.42, size = 21, normalized size = 0.72

$$-\frac{2i\,(i\,a\tan(dx+c)+a)^{\frac{9}{2}}}{9\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] -2/9*I*(I*a*tan(d*x + c) + a)^(9/2)/(a*d)
```

mupad [B] time = 6.28, size = 306, normalized size = 10.55

$$-\frac{a^3\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,32i}{9\,d}+\frac{a^3\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,128i}{9\,d\left(e^{c\,2i+d\,x\,2i}+1\right)}-\frac{a^3\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,64i}{3\,d\left(e^{c\,2i+d\,x\,2i}+1\right)^2}+\frac{a^3\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\right.}{e^{c\,2i+d\,x\,2}}}}{9\,d\left(e^{c\,2i+d\,x\,2i}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(7/2)/cos(c + d*x)^2,x)
```

```
[Out] (a^3*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/
2)*128i)/(9*d*(exp(c*2i + d*x*2i) + 1)) - (a^3*(a - (a*(exp(c*2i + d*x*2i)*
1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*32i)/(9*d) - (a^3*(a - (a*(exp
(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*64i)/(3*d*(exp
(c*2i + d*x*2i) + 1)^2) + (a^3*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(ex
p(c*2i + d*x*2i) + 1))^(1/2)*128i)/(9*d*(exp(c*2i + d*x*2i) + 1)^3) - (a^3*
(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*32
i)/(9*d*(exp(c*2i + d*x*2i) + 1)^4)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2*(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.323 $\int \cos^2(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx$

Optimal. Leaf size=116

$$\frac{3i\sqrt{2}a^{7/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{d}-\frac{ia^3(a+ia\tan(c+dx))^{3/2}}{d(a-ia\tan(c+dx))}-\frac{3ia^3\sqrt{a+ia\tan(c+dx)}}{d}$$

```
[Out] 3*I*a^(7/2)*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))*2^(1/2)/d
-3*I*a^3*(a+I*a*tan(d*x+c))^(1/2)/d-I*a^3*(a+I*a*tan(d*x+c))^(3/2)/d/(a-I*a
*tan(d*x+c))
```

Rubi [A] time = 0.09, antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {3487, 47, 50, 63, 206}

$$-\frac{ia^3(a+ia\tan(c+dx))^{3/2}}{d(a-ia\tan(c+dx))}-\frac{3ia^3\sqrt{a+ia\tan(c+dx)}}{d}+\frac{3i\sqrt{2}a^{7/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] ((3*I)*Sqrt[2]*a^(7/2)*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a])
])/d - ((3*I)*a^3*Sqrt[a + I*a*Tan[c + d*x]])/d - (I*a^3*(a + I*a*Tan[c + d
*x])^(3/2))/(d*(a - I*a*Tan[c + d*x]))
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 50

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + n + 1)), x] + Dist[(n*(b*c - a*d))/
(b*(m + n + 1)), Int[(a + b*x)^m*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b,
c, d}, x] && NeQ[b*c - a*d, 0] && GtQ[n, 0] && NeQ[m + n + 1, 0] &&  !(IGtQ
[m, 0] && ( !IntegerQ[n] || (GtQ[m, 0] && LtQ[m - n, 0]))) &&  !ILtQ[m + n
+ 2, 0] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^2(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx = -\frac{\left(ia^3\right)\text{Subst}\left(\int \frac{(a+x)^{3/2}}{(a-x)^2}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{ia^3(a+ia\tan(c+dx))^{3/2}}{d(a-ia\tan(c+dx))} + \frac{\left(3ia^3\right)\text{Subst}\left(\int \frac{\sqrt{a+x}}{a-x}\,dx, x, ia\tan(c+dx\right.}{2d}$$

$$= -\frac{3ia^3\sqrt{a+ia\tan(c+dx)}}{d} - \frac{ia^3(a+ia\tan(c+dx))^{3/2}}{d(a-ia\tan(c+dx))} + \frac{\left(3ia^4\right)\text{Subst}}{}$$

$$= -\frac{3ia^3\sqrt{a+ia\tan(c+dx)}}{d} - \frac{ia^3(a+ia\tan(c+dx))^{3/2}}{d(a-ia\tan(c+dx))} + \frac{\left(6ia^4\right)\text{Subst}}{}$$

$$= \frac{3i\sqrt{2}\,a^{7/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{d} - \frac{3ia^3\sqrt{a+ia\tan(c+dx)}}{d} - \frac{ia^3(a}{d(a}$$

Mathematica [A] time = 1.41, size = 137, normalized size = 1.18

$$-\frac{i\sqrt{2}e^{-4i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(3e^{i(c+dx)}+e^{3i(c+dx)}-3\sqrt{1+e^{2i(c+dx)}}\sinh^{-1}\left(e^{i(c+dx)}\right)\right)(a+ia\tan(c+dx))^{7/2}}{d\sec^{\frac{7}{2}}(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] ((-I)*Sqrt[2]*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x)))]*(3*E^(I*(c +
d*x)) + E^((3*I)*(c + d*x)) - 3*Sqrt[1 + E^((2*I)*(c + d*x))]*ArcSinh[E^(I*
(c + d*x))])*(a + I*a*Tan[c + d*x])^(7/2))/(d*E^((4*I)*(c + d*x))*Sec[c + d
*x]^(7/2))
```

fricas [B] time = 2.47, size = 235, normalized size = 2.03

$$-\frac{6\sqrt{2}\sqrt{-\frac{a^7}{d^2}}\,d\log\left(\frac{4\left(a^4e^{(idx+ic)}+\sqrt{-\frac{a^7}{d^2}}\left(ide^{(2idx+2ic)}+id\right)\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\right)e^{(-idx-ic)}}{a^3}\right)-6\sqrt{2}\sqrt{-\frac{a^7}{d^2}}\,d\log\left(\frac{4\left(a^4e^{(idx+ic)}+\sqrt{-\frac{a^7}{d^2}}\left(-id\right.\right.}{}\right.}{4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] -1/4*(6*sqrt(2)*sqrt(-a^7/d^2)*d*log(4*(a^4*e^(I*d*x + I*c) + sqrt(-a^7/d^2
)*(I*d*e^(2*I*d*x + 2*I*c) + I*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)))*e^(-I*
d*x - I*c)/a^3) - 6*sqrt(2)*sqrt(-a^7/d^2)*d*log(4*(a^4*e^(I*d*x + I*c) + s
qrt(-a^7/d^2)*(-I*d*e^(2*I*d*x + 2*I*c) - I*d)*sqrt(a/(e^(2*I*d*x + 2*I*c)
+ 1)))*e^(-I*d*x - I*c)/a^3) - sqrt(2)*(-4*I*a^3*e^(3*I*d*x + 3*I*c) - 12*I
*a^3*e^(I*d*x + I*c))*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)))/d
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 1.26, size = 412, normalized size = 3.55

$$-\frac{\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(3i\sin\left(dx+c\right)\cos\left(dx+c\right)\operatorname{arctanh}\left(\frac{\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\sin(dx+c)\sqrt{2}}{2\cos(dx+c)}\right)\left(-\frac{2\cos(dx+c)}{1+\cos(dx+c)}\right)^{\frac{3}{2}}\sqrt{2}+3\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] -1/2/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(3*I*sin(d*x+c)*cos(d
*x+c)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c
)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(3/2)*2^(1/2)+3*I*arctanh(1/2*(-2
*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*2^(1/2)*(-
2*cos(d*x+c)/(1+cos(d*x+c)))^(3/2)*sin(d*x+c)+3*sin(d*x+c)*cos(d*x+c)*(-2*c
os(d*x+c)/(1+cos(d*x+c)))^(3/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(
1/2)*2^(1/2))*2^(1/2)+3*2^(1/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(
1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(3/2)*sin(d*x+c)+8*I*cos(d*x+c
)^4-4*I*cos(d*x+c)^3-8*cos(d*x+c)^3*sin(d*x+c)+4*cos(d*x+c)^2*sin(d*x+c)-4*
I*cos(d*x+c)-4*cos(d*x+c)*sin(d*x+c))/(I*sin(d*x+c)+cos(d*x+c)-1)/cos(d*x+c
)*a^3
```

maxima [A] time = 0.65, size = 117, normalized size = 1.01

$$-\frac{i\left(3\sqrt{2}a^{\frac{9}{2}}\log\left(-\frac{\sqrt{2}\sqrt{a}-\sqrt{ia\tan(dx+c)+a}}{\sqrt{2}\sqrt{a}+\sqrt{ia\tan(dx+c)+a}}\right)+4\sqrt{ia\tan\left(dx+c\right)+a}\,a^4-\frac{4\sqrt{ia\tan(dx+c)+a}\,a^5}{ia\tan(dx+c)-a}\right)}{2ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] -1/2*I*(3*sqrt(2)*a^(9/2)*log(-(sqrt(2)*sqrt(a) - sqrt(I*a*tan(d*x + c) + a
))/(sqrt(2)*sqrt(a) + sqrt(I*a*tan(d*x + c) + a))) + 4*sqrt(I*a*tan(d*x + c
) + a)*a^4 - 4*sqrt(I*a*tan(d*x + c) + a)*a^5/(I*a*tan(d*x + c) - a))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \cos\left(c+d\,x\right)^2\,{\left(a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^{7/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^(7/2),x)
```

```
[Out] int(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^(7/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2*(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.324 $\int \cos^4(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx$

Optimal. Leaf size=137

$$\frac{ia^{7/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{8\sqrt{2}d}-\frac{ia^5\sqrt{a+ia\tan(c+dx)}}{2d(a-ia\tan(c+dx))^2}+\frac{ia^4\sqrt{a+ia\tan(c+dx)}}{8d(a-ia\tan(c+dx))}$$

```
[Out] 1/16*I*a^(7/2)*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))/d*2^(1
/2)-1/2*I*a^5*(a+I*a*tan(d*x+c))^(1/2)/d/(a-I*a*tan(d*x+c))^2+1/8*I*a^4*(a+
I*a*tan(d*x+c))^(1/2)/d/(a-I*a*tan(d*x+c))
```

Rubi [A] time = 0.09, antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = $\{3487, 47, 51, 63, 206\}$

$$-\frac{ia^5\sqrt{a+ia\tan(c+dx)}}{2d(a-ia\tan(c+dx))^2}+\frac{ia^4\sqrt{a+ia\tan(c+dx)}}{8d(a-ia\tan(c+dx))}+\frac{ia^{7/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{8\sqrt{2}d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] ((I/8)*a^(7/2)*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a])])/(Sqrt
[2]*d) - ((I/2)*a^5*Sqrt[a + I*a*Tan[c + d*x]])/(d*(a - I*a*Tan[c + d*x])^2
) + ((I/8)*a^4*Sqrt[a + I*a*Tan[c + d*x]])/(d*(a - I*a*Tan[c + d*x]))
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^4(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx = -\frac{(ia^5)\,\text{Subst}\left(\int \frac{\sqrt{a+x}}{(a-x)^3}\,dx, x, ia\tan(c+dx)\right)}{d}$$
$$= -\frac{ia^5\sqrt{a+ia\tan(c+dx)}}{2d(a-ia\tan(c+dx))^2} + \frac{(ia^5)\,\text{Subst}\left(\int \frac{1}{(a-x)^2\sqrt{a+x}}\,dx, x, ia\tan(c\right.}{4d}$$
$$= -\frac{ia^5\sqrt{a+ia\tan(c+dx)}}{2d(a-ia\tan(c+dx))^2} + \frac{ia^4\sqrt{a+ia\tan(c+dx)}}{8d(a-ia\tan(c+dx))} + \frac{(ia^4)\,\text{Subst}\left(\right.}{}$$
$$= -\frac{ia^5\sqrt{a+ia\tan(c+dx)}}{2d(a-ia\tan(c+dx))^2} + \frac{ia^4\sqrt{a+ia\tan(c+dx)}}{8d(a-ia\tan(c+dx))} + \frac{(ia^4)\,\text{Subst}\left(\right.}{}$$
$$= \frac{ia^{7/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{8\sqrt{2}\,d} - \frac{ia^5\sqrt{a+ia\tan(c+dx)}}{2d(a-ia\tan(c+dx))^2} + \frac{ia^4\sqrt{a+}}{8d(a-i}$$

Mathematica [A] time = 1.49, size = 152, normalized size = 1.11

$$-\frac{ie^{-4i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(e^{i(c+dx)}+3e^{3i(c+dx)}+2e^{5i(c+dx)}-\sqrt{1+e^{2i(c+dx)}}\sinh^{-1}\left(e^{i(c+dx)}\right)\right)(a+ia\tan(c+dx))^{7/2}}{8\sqrt{2}\,d\sec^{\frac{7}{2}}(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] ((-1/8*I)*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x)))]*(E^(I*(c + d*x))
+ 3*E^((3*I)*(c + d*x)) + 2*E^((5*I)*(c + d*x)) - Sqrt[1 + E^((2*I)*(c + d*
x))]*ArcSinh[E^(I*(c + d*x))])*(a + I*a*Tan[c + d*x])^(7/2))/(Sqrt[2]*d*E^(
(4*I)*(c + d*x))*Sec[c + d*x]^(7/2))
```

fricas [B] time = 0.70, size = 262, normalized size = 1.91

$$-\frac{\sqrt{\frac{1}{2}}\sqrt{-\frac{a^7}{d^2}}\,d\log\left(\frac{\left(16\,a^4e^{(i\,dx+i\,c)}+\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{-\frac{a^7}{d^2}}\left(16i\,de^{(2i\,dx+2i\,c)}+16i\,d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\right)e^{(-i\,dx-i\,c)}}{4\,a^3}\right) - \sqrt{\frac{1}{2}}\sqrt{-\frac{a^7}{d^2}}\,d\log\left(\frac{\left(16\,a^4e^{(i\,dx+}\right.}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] -1/16*(sqrt(1/2)*sqrt(-a^7/d^2)*d*log(1/4*(16*a^4*e^(I*d*x + I*c) + sqrt(2)
*sqrt(1/2)*sqrt(-a^7/d^2)*(16*I*d*e^(2*I*d*x + 2*I*c) + 16*I*d)*sqrt(a/(e^(
2*I*d*x + 2*I*c) + 1)))*e^(-I*d*x - I*c)/a^3) - sqrt(1/2)*sqrt(-a^7/d^2)*d*
log(1/4*(16*a^4*e^(I*d*x + I*c) + sqrt(2)*sqrt(1/2)*sqrt(-a^7/d^2)*(-16*I*d
*e^(2*I*d*x + 2*I*c) - 16*I*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)))*e^(-I*d*x
 - I*c)/a^3) - sqrt(2)*(-2*I*a^3*e^(5*I*d*x + 5*I*c) - 3*I*a^3*e^(3*I*d*x +
 3*I*c) - I*a^3*e^(I*d*x + I*c))*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)))/d
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
[Out] Timed out
```

maple [B] time = 1.28, size = 742, normalized size = 5.42

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^(7/2),x)
[Out] -1/128/d*(-128*I*cos(d*x+c)^7+16*I*cos(d*x+c)^4+cos(d*x+c)^3*2^(1/2)*sin(d*
x+c)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c
)/(1+cos(d*x+c)))^(7/2)+3*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(7/2)*arctanh(1/
2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*sin(d
*x+c)*cos(d*x+c)*2^(1/2)+3*cos(d*x+c)^2*2^(1/2)*sin(d*x+c)*arctan(1/2*(-2*c
os(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(7/
2)-224*I*cos(d*x+c)^6+3*cos(d*x+c)*2^(1/2)*sin(d*x+c)*arctan(1/2*(-2*cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(7/2)+2^
(1/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+
c)/(1+cos(d*x+c)))^(7/2)*sin(d*x+c)+80*I*cos(d*x+c)^5+3*I*(-2*cos(d*x+c)/(1
+cos(d*x+c)))^(7/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*
x+c)/cos(d*x+c)*2^(1/2))*sin(d*x+c)*cos(d*x+c)^2*2^(1/2)-256*sin(d*x+c)*cos
(d*x+c)^7+I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(7/2)*arctanh(1/2*(-2*cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*sin(d*x+c)*cos(d*x+c)
^3*2^(1/2)+128*sin(d*x+c)*cos(d*x+c)^6+256*I*cos(d*x+c)^8+96*cos(d*x+c)^5*s
in(d*x+c)+I*2^(1/2)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(7/2)*arctanh(1/2*(-2*co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*sin(d*x+c)-16
*sin(d*x+c)*cos(d*x+c)^4)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/(I
*sin(d*x+c)+cos(d*x+c)-1)/cos(d*x+c)^3*a^3
```

maxima [A] time = 0.59, size = 138, normalized size = 1.01

$$-\frac{i\left(\sqrt{2}\,a^{\frac{9}{2}}\log\left(-\frac{\sqrt{2}\,\sqrt{a}-\sqrt{i\,a\tan(dx+c)+a}}{\sqrt{2}\,\sqrt{a}+\sqrt{i\,a\tan(dx+c)+a}}\right)+\frac{4\left((i\,a\tan(dx+c)+a)^{\frac{3}{2}}a^5+2\,\sqrt{i\,a\tan(dx+c)+a}\,a^6\right)}{(i\,a\tan(dx+c)+a)^2-4\,(i\,a\tan(dx+c)+a)a+4\,a^2}\right)}{32\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
[Out] -1/32*I*(sqrt(2)*a^(9/2)*log(-(sqrt(2)*sqrt(a) - sqrt(I*a*tan(d*x + c) + a)
)/(sqrt(2)*sqrt(a) + sqrt(I*a*tan(d*x + c) + a))) + 4*((I*a*tan(d*x + c) +
a)^(3/2)*a^5 + 2*sqrt(I*a*tan(d*x + c) + a)*a^6)/((I*a*tan(d*x + c) + a)^2
- 4*(I*a*tan(d*x + c) + a)*a + 4*a^2))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \cos(c+d\,x)^4\,(a+a\tan(c+d\,x)\,1\mathrm{i})^{7/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^(7/2),x)
```

```
[Out] int(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^(7/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4*(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.325 $\int \cos^6(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx$

Optimal. Leaf size=181

$$-\frac{5ia^{7/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{64\sqrt{2}d}-\frac{ia^6\sqrt{a+ia\tan(c+dx)}}{6d(a-ia\tan(c+dx))^3}-\frac{5ia^5\sqrt{a+ia\tan(c+dx)}}{48d(a-ia\tan(c+dx))^2}-\frac{5ia^4\sqrt{a+ia\tan(c+dx)}}{64d(a-ia\tan(c+dx))}$$

```
[Out] -5/128*I*a^(7/2)*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))/d*2^
(1/2)-1/6*I*a^6*(a+I*a*tan(d*x+c))^(1/2)/d/(a-I*a*tan(d*x+c))^3-5/48*I*a^5*
(a+I*a*tan(d*x+c))^(1/2)/d/(a-I*a*tan(d*x+c))^2-5/64*I*a^4*(a+I*a*tan(d*x+c
))^(1/2)/d/(a-I*a*tan(d*x+c))
```

Rubi [A] time = 0.11, antiderivative size = 181, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {3487, 51, 63, 206}

$$-\frac{ia^6\sqrt{a+ia\tan(c+dx)}}{6d(a-ia\tan(c+dx))^3}-\frac{5ia^5\sqrt{a+ia\tan(c+dx)}}{48d(a-ia\tan(c+dx))^2}-\frac{5ia^4\sqrt{a+ia\tan(c+dx)}}{64d(a-ia\tan(c+dx))}-\frac{5ia^{7/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{64\sqrt{2}d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^6*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((-5*I)/64)*a^(7/2)*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a])])
/(Sqrt[2]*d) - ((I/6)*a^6*Sqrt[a + I*a*Tan[c + d*x]])/(d*(a - I*a*Tan[c + d
*x])^3) - (((5*I)/48)*a^5*Sqrt[a + I*a*Tan[c + d*x]])/(d*(a - I*a*Tan[c + d
*x])^2) - (((5*I)/64)*a^4*Sqrt[a + I*a*Tan[c + d*x]])/(d*(a - I*a*Tan[c + d
*x]))
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^6(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx = -\frac{\left(ia^7\right)\text{Subst}\left(\int \frac{1}{(a-x)^4\sqrt{a+x}}\,dx,x,ia\tan(c+dx)\right)}{d}$$

$$= -\frac{ia^6\sqrt{a+ia\tan(c+dx)}}{6d(a-ia\tan(c+dx))^3} - \frac{\left(5ia^6\right)\text{Subst}\left(\int \frac{1}{(a-x)^3\sqrt{a+x}}\,dx,x,ia\tan\right.}{12d}$$

$$= -\frac{ia^6\sqrt{a+ia\tan(c+dx)}}{6d(a-ia\tan(c+dx))^3} - \frac{5ia^5\sqrt{a+ia\tan(c+dx)}}{48d(a-ia\tan(c+dx))^2} - \frac{\left(5ia^5\right)\text{Subs}}{}$$

$$= -\frac{ia^6\sqrt{a+ia\tan(c+dx)}}{6d(a-ia\tan(c+dx))^3} - \frac{5ia^5\sqrt{a+ia\tan(c+dx)}}{48d(a-ia\tan(c+dx))^2} - \frac{5ia^4\sqrt{a+ia}}{64d(a-ia}$$

$$= -\frac{ia^6\sqrt{a+ia\tan(c+dx)}}{6d(a-ia\tan(c+dx))^3} - \frac{5ia^5\sqrt{a+ia\tan(c+dx)}}{48d(a-ia\tan(c+dx))^2} - \frac{5ia^4\sqrt{a+ia}}{64d(a-ia}$$

$$= -\frac{5ia^{7/2}\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{64\sqrt{2}\,d} - \frac{ia^6\sqrt{a+ia\tan(c+dx)}}{6d(a-ia\tan(c+dx))^3} - \frac{5ia^5\sqrt{}}{48d(a}$$

Mathematica [A] time = 1.11, size = 129, normalized size = 0.71

$$-\frac{ia^3e^{-i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\left(e^{i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\left(26e^{2i(c+dx)}+8e^{4i(c+dx)}+33\right)+15\sinh^{-1}\left(e^{i(c+dx)}\right)\right)\sqrt{a+ia\,\text{ta}}}{384d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^6*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] ((-1/384*I)*a^3*Sqrt[1 + E^((2*I)*(c + d*x))]*(E^(I*(c + d*x))*Sqrt[1 + E^(
(2*I)*(c + d*x))]*(33 + 26*E^((2*I)*(c + d*x)) + 8*E^((4*I)*(c + d*x))) + 1
5*ArcSinh[E^(I*(c + d*x))])*Sqrt[a + I*a*Tan[c + d*x]])/(d*E^(I*(c + d*x)))
```

fricas [B] time = 0.89, size = 276, normalized size = 1.52

$$15\sqrt{\frac{1}{2}}\sqrt{-\frac{a^7}{d^2}}\,d\log\left(\frac{\left(128\,a^4e^{(i\,dx+i\,c)}+\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{-\frac{a^7}{d^2}}\left(128i\,de^{(2i\,dx+2i\,c)}+128i\,d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\right)e^{(-i\,dx-i\,c)}}{32\,a^3}\right)-15\sqrt{\frac{1}{2}}\sqrt{-\frac{a^7}{d^2}}\,d\log\left(\left(12\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/384*(15*sqrt(1/2)*sqrt(-a^7/d^2)*d*log(1/32*(128*a^4*e^(I*d*x + I*c) + sq
rt(2)*sqrt(1/2)*sqrt(-a^7/d^2)*(128*I*d*e^(2*I*d*x + 2*I*c) + 128*I*d)*sqrt
(a/(e^(2*I*d*x + 2*I*c) + 1)))*e^(-I*d*x - I*c)/a^3) - 15*sqrt(1/2)*sqrt(-a
^7/d^2)*d*log(1/32*(128*a^4*e^(I*d*x + I*c) + sqrt(2)*sqrt(1/2)*sqrt(-a^7/d
^2)*(-128*I*d*e^(2*I*d*x + 2*I*c) - 128*I*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) +
1)))*e^(-I*d*x - I*c)/a^3) + sqrt(2)*(-8*I*a^3*e^(7*I*d*x + 7*I*c) - 34*I*a
^3*e^(5*I*d*x + 5*I*c) - 59*I*a^3*e^(3*I*d*x + 3*I*c) - 33*I*a^3*e^(I*d*x +
 I*c))*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)))/d
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 1.63, size = 1088, normalized size = 6.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] -1/12288/d*(-15*I*cos(d*x+c)^5*2^(1/2)*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x
+c)))^(11/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/co
s(d*x+c)*2^(1/2))-75*I*cos(d*x+c)^4*2^(1/2)*sin(d*x+c)*(-2*cos(d*x+c)/(1+co
s(d*x+c)))^(11/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+
c)/cos(d*x+c)*2^(1/2))+16384*I*cos(d*x+c)^12-15*(-2*cos(d*x+c)/(1+cos(d*x+c
)))^(11/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)
*sin(d*x+c)-8192*I*cos(d*x+c)^11-11264*I*cos(d*x+c)^10-16384*sin(d*x+c)*cos
(d*x+c)^11+3072*sin(d*x+c)*cos(d*x+c)^9+512*sin(d*x+c)*cos(d*x+c)^8+8192*si
n(d*x+c)*cos(d*x+c)^10-15*sin(d*x+c)*cos(d*x+c)^5*(-2*cos(d*x+c)/(1+cos(d*x
+c)))^(11/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/
2)-75*sin(d*x+c)*cos(d*x+c)^4*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*arctan(
1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)-150*sin(d*x+c)*co
s(d*x+c)^3*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*arctan(1/2*(-2*cos(d*x+c)/
(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)-150*sin(d*x+c)*cos(d*x+c)^2*(-2*cos(
d*x+c)/(1+cos(d*x+c)))^(11/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/
2)*2^(1/2))*2^(1/2)-75*sin(d*x+c)*cos(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))
^(11/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)-64
0*sin(d*x+c)*cos(d*x+c)^7+960*sin(d*x+c)*cos(d*x+c)^6+3584*I*cos(d*x+c)^9+3
20*I*cos(d*x+c)^7-960*I*cos(d*x+c)^6+128*I*cos(d*x+c)^8-150*I*cos(d*x+c)^3*
2^(1/2)*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*arctanh(1/2*(-2*co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))-150*I*cos(d*x
+c)^2*2^(1/2)*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*arctanh(1/2*
(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))-75*I*co
s(d*x+c)*2^(1/2)*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*arctanh(1
/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))-15*I
*2^(1/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*
x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(11/2)*sin(d*x+c))*(a*(I*sin(d
*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/(I*sin(d*x+c)+cos(d*x+c)-1)/cos(d*x+c)^
5*a^3
```

maxima [A] time = 0.60, size = 176, normalized size = 0.97

$$\frac{i\left(15\sqrt{2}\,a^{\frac{9}{2}}\log\left(-\frac{\sqrt{2}\,\sqrt{a}-\sqrt{i\,a\tan(dx+c)+a}}{\sqrt{2}\,\sqrt{a}+\sqrt{i\,a\tan(dx+c)+a}}\right)+\frac{4\left(15\,(i\,a\tan(dx+c)+a)^{\frac{5}{2}}a^5-80\,(i\,a\tan(dx+c)+a)^{\frac{3}{2}}a^6+132\,\sqrt{i\,a\tan(dx+c)+a}\,a^7\right)}{(i\,a\tan(dx+c)+a)^3-6\,(i\,a\tan(dx+c)+a)^2a+12\,(i\,a\tan(dx+c)+a)a^2-8\,a^3}\right)}{768\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] 1/768*I*(15*sqrt(2)*a^(9/2)*log(-(sqrt(2)*sqrt(a) - sqrt(I*a*tan(d*x + c) +
 a))/(sqrt(2)*sqrt(a) + sqrt(I*a*tan(d*x + c) + a))) + 4*(15*(I*a*tan(d*x +
 c) + a)^(5/2)*a^5 - 80*(I*a*tan(d*x + c) + a)^(3/2)*a^6 + 132*sqrt(I*a*tan
(d*x + c) + a)*a^7)/((I*a*tan(d*x + c) + a)^3 - 6*(I*a*tan(d*x + c) + a)^2*
a + 12*(I*a*tan(d*x + c) + a)*a^2 - 8*a^3))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \cos(c+dx)^6 (a+a\tan(c+dx)\,1\mathrm{i})^{7/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^(7/2),x)
[Out] int(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^(7/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**6*(a+I*a*tan(d*x+c))**(7/2),x)
[Out] Timed out
```

3.326 $\int \sec(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx$

Optimal. Leaf size=139

$$\frac{256ia^4\sec(c+dx)}{35d\sqrt{a+ia\tan(c+dx)}}+\frac{64ia^3\sec(c+dx)\sqrt{a+ia\tan(c+dx)}}{35d}+\frac{24ia^2\sec(c+dx)(a+ia\tan(c+dx))^{3/2}}{35d}+\frac{2ia\sec\ldots}{}$$

```
[Out] 256/35*I*a^4*sec(d*x+c)/d/(a+I*a*tan(d*x+c))^(1/2)+64/35*I*a^3*sec(d*x+c)*(
a+I*a*tan(d*x+c))^(1/2)/d+24/35*I*a^2*sec(d*x+c)*(a+I*a*tan(d*x+c))^(3/2)/d
+2/7*I*a*sec(d*x+c)*(a+I*a*tan(d*x+c))^(5/2)/d
```

Rubi [A] time = 0.14, antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3494, 3493}

$$\frac{256ia^4\sec(c+dx)}{35d\sqrt{a+ia\tan(c+dx)}}+\frac{64ia^3\sec(c+dx)\sqrt{a+ia\tan(c+dx)}}{35d}+\frac{24ia^2\sec(c+dx)(a+ia\tan(c+dx))^{3/2}}{35d}+\frac{2ia\sec\ldots}{}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((256*I)/35)*a^4*Sec[c + d*x])/(d*Sqrt[a + I*a*Tan[c + d*x]]) + (((64*I)/3
5)*a^3*Sec[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])/d + (((24*I)/35)*a^2*Sec[c
+ d*x]*(a + I*a*Tan[c + d*x])^(3/2))/d + (((2*I)/7)*a*Sec[c + d*x]*(a + I*a
*Tan[c + d*x])^(5/2))/d
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int \sec(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx &= \frac{2ia\sec(c+dx)(a+ia\tan(c+dx))^{5/2}}{7d}+\frac{1}{7}(12a)\int \sec(c+dx)(a+ia\,\mathrm{ta}\ldots\\ &= \frac{24ia^2\sec(c+dx)(a+ia\tan(c+dx))^{3/2}}{35d}+\frac{2ia\sec(c+dx)(a+ia\tan(c\ldots}{7d}\\ &= \frac{64ia^3\sec(c+dx)\sqrt{a+ia\tan(c+dx)}}{35d}+\frac{24ia^2\sec(c+dx)(a+ia\tan(c\ldots}{35d}\\ &= \frac{256ia^4\sec(c+dx)}{35d\sqrt{a+ia\tan(c+dx)}}+\frac{64ia^3\sec(c+dx)\sqrt{a+ia\tan(c+dx)}}{35d}+\frac{24i\ldots}{}\end{aligned}$$

Mathematica [A] time = 0.77, size = 109, normalized size = 0.78

$$\frac{2a^3\sec^2(c+dx)\sqrt{a+ia\tan(c+dx)}\,(\sin(c-2dx)+i\cos(c-2dx))(102\cos(2(c+dx))+14i\tan(c+dx)+19i\sin\ldots}{35d(\cos(dx)+i\sin(dx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (2*a^3*Sec[c + d*x]^2*(I*Cos[c - 2*d*x] + Sin[c - 2*d*x])*(75 + 102*Cos[2*(
c + d*x)] + (19*I)*Sec[c + d*x]*Sin[3*(c + d*x)] + (14*I)*Tan[c + d*x])*Sqr
t[a + I*a*Tan[c + d*x]])/(35*d*(Cos[d*x] + I*Sin[d*x])^3)
```

fricas [A] time = 1.84, size = 109, normalized size = 0.78

$$\frac{\sqrt{2}\left(560i\,a^3e^{(6i\,dx+6i\,c)}+1120i\,a^3e^{(4i\,dx+4i\,c)}+896i\,a^3e^{(2i\,dx+2i\,c)}+256i\,a^3\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}}{35\left(de^{(6i\,dx+6i\,c)}+3\,de^{(4i\,dx+4i\,c)}+3\,de^{(2i\,dx+2i\,c)}+d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/35*sqrt(2)*(560*I*a^3*e^(6*I*d*x + 6*I*c) + 1120*I*a^3*e^(4*I*d*x + 4*I*c
) + 896*I*a^3*e^(2*I*d*x + 2*I*c) + 256*I*a^3)*sqrt(a/(e^(2*I*d*x + 2*I*c)
+ 1))/(d*e^(6*I*d*x + 6*I*c) + 3*d*e^(4*I*d*x + 4*I*c) + 3*d*e^(2*I*d*x + 2
*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{7}{2}}\sec(dx+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(7/2)*sec(d*x + c), x)
```

maple [A] time = 0.93, size = 100, normalized size = 0.72

$$\frac{2\left(128i\left(\cos^4(dx+c)\right)+128\left(\cos^3(dx+c)\right)\sin(dx+c)+54i\left(\cos^2(dx+c)\right)-22\cos(dx+c)\sin(dx+c)-5\right.}{35d\cos(dx+c)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)*(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] 2/35/d*(128*I*cos(d*x+c)^4+128*cos(d*x+c)^3*sin(d*x+c)+54*I*cos(d*x+c)^2-22
*cos(d*x+c)*sin(d*x+c)-5*I)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/
cos(d*x+c)^3*a^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{7}{2}}\sec(dx+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(7/2)*sec(d*x + c), x)
```

mupad [B] time = 6.00, size = 286, normalized size = 2.06

$$\frac{a^3\,\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,16\mathrm{i}}{d}-\frac{a^3\,\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,16\mathrm{i}}{d\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}+\frac{a^3\,\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\right.}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2}}}}{5\,d\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(7/2)/cos(c + d*x),x)
```

```
[Out] (a^3*exp(- c*1i - d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2
i + d*x*2i) + 1))^(1/2)*16i)/d - (a^3*exp(- c*1i - d*x*1i)*(a - (a*(exp(c*2
i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*16i)/(d*(exp(c*2i
+ d*x*2i) + 1)) + (a^3*exp(- c*1i - d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i
- 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*48i)/(5*d*(exp(c*2i + d*x*2i) + 1
)^2) - (a^3*exp(- c*1i - d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(
exp(c*2i + d*x*2i) + 1))^(1/2)*16i)/(7*d*(exp(c*2i + d*x*2i) + 1)^3)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.327 $\int \cos(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx$

Optimal. Leaf size=104

$$-\frac{64ia^3\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{3d}+\frac{16ia^2\cos(c+dx)(a+ia\tan(c+dx))^{3/2}}{3d}+\frac{2ia\cos(c+dx)(a+ia\tan(c+dx))^{5/2}}{3d}$$

```
[Out] -64/3*I*a^3*cos(d*x+c)*(a+I*a*tan(d*x+c))^(1/2)/d+16/3*I*a^2*cos(d*x+c)*(a+
I*a*tan(d*x+c))^(3/2)/d+2/3*I*a*cos(d*x+c)*(a+I*a*tan(d*x+c))^(5/2)/d
```

Rubi [A] time = 0.15, antiderivative size = 104, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3494, 3493}

$$-\frac{64ia^3\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{3d}+\frac{16ia^2\cos(c+dx)(a+ia\tan(c+dx))^{3/2}}{3d}+\frac{2ia\cos(c+dx)(a+ia\tan(c+dx))^{5/2}}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((-64*I)/3)*a^3*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])/d + (((16*I)/3)*a
^2*Cos[c + d*x]*(a + I*a*Tan[c + d*x])^(3/2))/d + (((2*I)/3)*a*Cos[c + d*x]
*(a + I*a*Tan[c + d*x])^(5/2))/d
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] && !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int \cos(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx &= \frac{2ia\cos(c+dx)(a+ia\tan(c+dx))^{5/2}}{3d}+\frac{1}{3}(8a)\int \cos(c+dx)(a+ia\tan(c+dx))^{5/2}\,dx\\ &= \frac{16ia^2\cos(c+dx)(a+ia\tan(c+dx))^{3/2}}{3d}+\frac{2ia\cos(c+dx)(a+ia\tan(c+dx))^{5/2}}{3d}+\ldots\\ &= -\frac{64ia^3\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{3d}+\frac{16ia^2\cos(c+dx)(a+ia\tan(c+dx))^{3/2}}{3d}+\ldots\end{aligned}$$

Mathematica [A] time = 0.44, size = 59, normalized size = 0.57

$$-\frac{2ia^3\sec(c+dx)\sqrt{a+ia\tan(c+dx)}\,(-5i\sin(2(c+dx))+11\cos(2(c+dx))+12)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]*(a + I*a*Tan[c + d*x])^(7/2),x]
```

[Out] (((-2*I)/3)*a^3*Sec[c + d*x]*(12 + 11*Cos[2*(c + d*x)] - (5*I)*Sin[2*(c + d
*x)])*Sqrt[a + I*a*Tan[c + d*x]])/d

fricas [A] time = 1.06, size = 71, normalized size = 0.68

$$\frac{\sqrt{2}\left(-12i\, a^{3}e^{(4i\, dx+4i\, c)} - 48i\, a^{3}e^{(2i\, dx+2i\, c)} - 32i\, a^{3}\right)\sqrt{\frac{a}{e^{(2i\, dx+2i\, c)}+1}}}{3\left(de^{(2i\, dx+2i\, c)} + d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")

[Out] 1/3*sqrt(2)*(-12*I*a^3*e^(4*I*d*x + 4*I*c) - 48*I*a^3*e^(2*I*d*x + 2*I*c) -
32*I*a^3)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))/(d*e^(2*I*d*x + 2*I*c) + d)

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\, a \tan(dx+c) + a)^{\frac{7}{2}} \cos(dx+c)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")

[Out] integrate((I*a*tan(d*x + c) + a)^(7/2)*cos(d*x + c), x)

maple [A] time = 1.10, size = 73, normalized size = 0.70

$$-\frac{2\left(22i\left(\cos^{2}(dx+c)\right) + 10\cos(dx+c)\sin(dx+c) + i\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\; a^{3}}{3d\cos(dx+c)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(cos(d*x+c)*(a+I*a*tan(d*x+c))^(7/2),x)

[Out] -2/3/d*(22*I*cos(d*x+c)^2+10*cos(d*x+c)*sin(d*x+c)+I)*(a*(I*sin(d*x+c)+cos(
d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)*a^3

maxima [B] time = 1.03, size = 418, normalized size = 4.02

$$\frac{2\left(23i\, a^{\frac{7}{2}} + \frac{20\, a^{\frac{7}{2}}\sin(dx+c)}{\cos(dx+c)+1} - \frac{88i\, a^{\frac{7}{2}}\sin(dx+c)^{2}}{(\cos(dx+c)+1)^{2}} - \frac{60\, a^{\frac{7}{2}}\sin(dx+c)^{3}}{(\cos(dx+c)+1)^{3}} + \frac{130i\, a^{\frac{7}{2}}\sin(dx+c)^{4}}{(\cos(dx+c)+1)^{4}} + \frac{60\, a^{\frac{7}{2}}\sin(dx+c)^{5}}{(\cos(dx+c)+1)^{5}} - \frac{88i\, a^{\frac{7}{2}}\sin(dx+c)^{6}}{(\cos(dx+c)+1)^{6}} - \frac{20\, a \cdots}{(\cos \cdots}\right.}{d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{7}{2}}\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right)^{\frac{7}{2}}\left(-\frac{18i\sin(dx+c)}{\cos(dx+c)+1} + \frac{42\sin(dx+c)^{2}}{(\cos(dx+c)+1)^{2}} + \frac{42i\sin(dx+c)^{3}}{(\cos(dx+c)+1)^{3}} + \frac{42i\sin(dx+c)^{5}}{(\cos(dx+c)+1)^{5}} - \cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")

[Out] 2*(23*I*a^(7/2) + 20*a^(7/2)*sin(d*x + c)/(cos(d*x + c) + 1) - 88*I*a^(7/2)
*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 60*a^(7/2)*sin(d*x + c)^3/(cos(d*x +
c) + 1)^3 + 130*I*a^(7/2)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + 60*a^(7/2)
*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 88*I*a^(7/2)*sin(d*x + c)^6/(cos(d*x
+ c) + 1)^6 - 20*a^(7/2)*sin(d*x + c)^7/(cos(d*x + c) + 1)^7 + 23*I*a^(7/2
)*sin(d*x + c)^8/(cos(d*x + c) + 1)^8)*(-2*I*sin(d*x + c)/(cos(d*x + c) + 1
) + sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 1)^(7/2)/(d*(sin(d*x + c)/(cos(d*
x + c) + 1) + 1)^(7/2)*(sin(d*x + c)/(cos(d*x + c) + 1) - 1)^(7/2)*(-18*I*s
in(d*x + c)/(cos(d*x + c) + 1) + 42*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 4
2*I*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 42*I*sin(d*x + c)^5/(cos(d*x + c)

```
 + 1)^5 - 42*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 - 18*I*sin(d*x + c)^7/(cos
(d*x + c) + 1)^7 + 3*sin(d*x + c)^8/(cos(d*x + c) + 1)^8 - 3))
```

mupad [B] time = 4.72, size = 102, normalized size = 0.98

$$-\frac{2\,a^3\,\sqrt{\frac{a\,\left(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1{}\mathrm{i}\right)}{\cos(2\,c+2\,d\,x)+1}}\,\left(5\,\sin\left(c+d\,x\right)+5\,\sin\left(3\,c+3\,d\,x\right)+\cos\left(c+d\,x\right)\,35{}\mathrm{i}+\cos\left(3\,c+3\,d\,x\right.\right.}{3\,d\,\left(\cos\left(2\,c+2\,d\,x\right)+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^(7/2),x)
```

```
[Out] -(2*a^3*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x)
 + 1))^(1/2)*(cos(c + d*x)*35i + 5*sin(c + d*x) + cos(3*c + 3*d*x)*11i + 5*
sin(3*c + 3*d*x)))/(3*d*(cos(2*c + 2*d*x) + 1))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.328 $\int \cos^3(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx$

Optimal. Leaf size=71

$$\frac{8ia^2\cos^3(c+dx)(a+ia\tan(c+dx))^{3/2}}{3d}-\frac{2ia\cos^3(c+dx)(a+ia\tan(c+dx))^{5/2}}{d}$$

```
[Out] 8/3*I*a^2*cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(3/2)/d-2*I*a*cos(d*x+c)^3*(a+I*a
*tan(d*x+c))^(5/2)/d
```

Rubi [A] time = 0.12, antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3494, 3493}

$$\frac{8ia^2\cos^3(c+dx)(a+ia\tan(c+dx))^{3/2}}{3d}-\frac{2ia\cos^3(c+dx)(a+ia\tan(c+dx))^{5/2}}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((8*I)/3)*a^2*Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^(3/2))/d - ((2*I)*a*Co
s[c + d*x]^3*(a + I*a*Tan[c + d*x])^(5/2))/d
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int \cos^3(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx &= -\frac{2ia\cos^3(c+dx)(a+ia\tan(c+dx))^{5/2}}{d}-(4a)\int \cos^3(c+dx)(a+ia\\ &= \frac{8ia^2\cos^3(c+dx)(a+ia\tan(c+dx))^{3/2}}{3d}-\frac{2ia\cos^3(c+dx)(a+ia\tan(}{d}\end{aligned}$$

Mathematica [A] time = 0.41, size = 86, normalized size = 1.21

$$\frac{2a^3\cos(c+dx)\sqrt{a+ia\tan(c+dx)}\,(3\sin(c+dx)+i\cos(c+dx))(\cos(c+4dx)+i\sin(c+4dx))}{3d(\cos(dx)+i\sin(dx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (2*a^3*Cos[c + d*x]*(I*Cos[c + d*x] + 3*Sin[c + d*x])*(Cos[c + 4*d*x] + I*S
in[c + 4*d*x])*Sqrt[a + I*a*Tan[c + d*x]])/(3*d*(Cos[d*x] + I*Sin[d*x])^3)
```

fricas [A] time = 0.73, size = 59, normalized size = 0.83

$$\frac{\sqrt{2}\left(-i\,a^3e^{(4i\,dx+4i\,c)}+i\,a^3e^{(2i\,dx+2i\,c)}+2i\,a^3\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/3*sqrt(2)*(-I*a^3*e^(4*I*d*x + 4*I*c) + I*a^3*e^(2*I*d*x + 2*I*c) + 2*I*a
^3)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{7}{2}}\cos(dx+c)^3\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(7/2)*cos(d*x + c)^3, x)
```

maple [A] time = 1.13, size = 71, normalized size = 1.00

$$\frac{2\left(-2i\left(\cos^2(dx+c)\right)+2\cos(dx+c)\sin(dx+c)+3i\right)\cos(dx+c)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\;a^3}{3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] 2/3/d*(-2*I*cos(d*x+c)^2+2*cos(d*x+c)*sin(d*x+c)+3*I)*cos(d*x+c)*(a*(I*sin(
d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*a^3
```

maxima [B] time = 0.72, size = 504, normalized size = 7.10

$$-\frac{2\left(-i\,a^{\frac{7}{2}}-\frac{6\,a^{\frac{7}{2}}\sin(dx+c)}{\cos(dx+c)+1}+\frac{5i\,a^{\frac{7}{2}}\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{24\,a^{\frac{7}{2}}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}-\frac{10i\,a^{\frac{7}{2}}\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{36\,a^{\frac{7}{2}}\sin(dx+c)^5}{(\cos(dx+c)+1)^5}+\frac{10i\,a^{\frac{7}{2}}\sin(dx+c)^6}{(\cos(dx+c)+1)^6}+\frac{24\,\cdots}{(\cdots}\right.}{d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{7}{2}}\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right)^{\frac{7}{2}}\left(\frac{12i\sin(dx+c)}{\cos(dx+c)+1}-\frac{9\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{24i\sin(dx+c)^3}{(\cos(dx+c)+1)^3}-\frac{42\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] -2*(-I*a^(7/2) - 6*a^(7/2)*sin(d*x + c)/(cos(d*x + c) + 1) + 5*I*a^(7/2)*si
n(d*x + c)^2/(cos(d*x + c) + 1)^2 + 24*a^(7/2)*sin(d*x + c)^3/(cos(d*x + c)
 + 1)^3 - 10*I*a^(7/2)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 36*a^(7/2)*sin
(d*x + c)^5/(cos(d*x + c) + 1)^5 + 10*I*a^(7/2)*sin(d*x + c)^6/(cos(d*x + c
) + 1)^6 + 24*a^(7/2)*sin(d*x + c)^7/(cos(d*x + c) + 1)^7 - 5*I*a^(7/2)*sin
(d*x + c)^8/(cos(d*x + c) + 1)^8 - 6*a^(7/2)*sin(d*x + c)^9/(cos(d*x + c) +
 1)^9 + I*a^(7/2)*sin(d*x + c)^10/(cos(d*x + c) + 1)^10)*(-2*I*sin(d*x + c)
/(cos(d*x + c) + 1) + sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 1)^(7/2)/(d*(si
n(d*x + c)/(cos(d*x + c) + 1) + 1)^(7/2)*(sin(d*x + c)/(cos(d*x + c) + 1) -
 1)^(7/2)*(12*I*sin(d*x + c)/(cos(d*x + c) + 1) - 9*sin(d*x + c)^2/(cos(d*x
 + c) + 1)^2 + 24*I*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 - 42*sin(d*x + c)^4
/(cos(d*x + c) + 1)^4 - 42*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 - 24*I*sin(d
*x + c)^7/(cos(d*x + c) + 1)^7 - 9*sin(d*x + c)^8/(cos(d*x + c) + 1)^8 - 12
```

```
*I*sin(d*x + c)^9/(cos(d*x + c) + 1)^9 + 3*sin(d*x + c)^10/(cos(d*x + c) +
1)^10 + 3))
```

mupad [B] time = 0.85, size = 85, normalized size = 1.20

$$\frac{a^3\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}\,\left(\sin\left(c+d\,x\right)+\sin\left(3\,c+3\,d\,x\right)+\cos\left(c+d\,x\right)\,3\mathrm{i}-\cos\left(3\,c+3\,d\,x\right)\,1\mathrm{i}\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^(7/2),x)
```

```
[Out] (a^3*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) +
1))^(1/2)*(cos(c + d*x)*3i + sin(c + d*x) - cos(3*c + 3*d*x)*1i + sin(3*c +
 3*d*x)))/(3*d)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3*(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.329 $\int \cos^5(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx$

Optimal. Leaf size=35

$$-\frac{2ia\cos^5(c+dx)(a+ia\tan(c+dx))^{5/2}}{5d}$$

```
[Out] -2/5*I*a*cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(5/2)/d
```

Rubi [A] time = 0.06, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.038$, Rules used = {3493}

$$-\frac{2ia\cos^5(c+dx)(a+ia\tan(c+dx))^{5/2}}{5d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((-2*I)/5)*a*Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^(5/2))/d
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rubi steps

$$\int \cos^5(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx = -\frac{2ia\cos^5(c+dx)(a+ia\tan(c+dx))^{5/2}}{5d}$$

Mathematica [B] time = 0.57, size = 73, normalized size = 2.09

$$\frac{2a^3\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}\,(\sin(2c+5dx)-i\cos(2c+5dx))}{5d(\cos(dx)+i\sin(dx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (2*a^3*Cos[c + d*x]^3*((-I)*Cos[2*c + 5*d*x] + Sin[2*c + 5*d*x])*Sqrt[a + I
*a*Tan[c + d*x]])/(5*d*(Cos[d*x] + I*Sin[d*x])^3)
```

fricas [B] time = 1.95, size = 73, normalized size = 2.09

$$\frac{\sqrt{2}\left(-i\,a^3e^{(6i\,dx+6i\,c)}-3i\,a^3e^{(4i\,dx+4i\,c)}-3i\,a^3e^{(2i\,dx+2i\,c)}-i\,a^3\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}}{20\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/20*sqrt(2)*(-I*a^3*e^(6*I*d*x + 6*I*c) - 3*I*a^3*e^(4*I*d*x + 4*I*c) - 3*
I*a^3*e^(2*I*d*x + 2*I*c) - I*a^3)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i a \tan(dx+c) + a)^{\frac{7}{2}} \cos(dx+c)^5 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(7/2)*cos(d*x + c)^5, x)
```

maple [B] time = 1.52, size = 73, normalized size = 2.09

$$-\frac{2\left(2i\left(\cos^2(dx+c)\right) - 2\cos(dx+c)\sin(dx+c) - i\right)\left(\cos^3(dx+c)\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\, a^3}{5d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] -2/5/d*(2*I*cos(d*x+c)^2-2*cos(d*x+c)*sin(d*x+c)-I)*cos(d*x+c)^3*(a*(I*sin(
d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*a^3
```

maxima [B] time = 0.66, size = 454, normalized size = 12.97

$$\frac{2\left(i a^{\frac{7}{2}} - \frac{6i a^{\frac{7}{2}} \sin(dx+c)^2}{(\cos(dx+c)+1)^2} + \frac{15i a^{\frac{7}{2}} \sin(dx+c)^4}{(\cos(dx+c)+1)^4} - \frac{20i a^{\frac{7}{2}} \sin(dx+c)^6}{(\cos(dx+c)+1)^6} + \frac{15i a^{\frac{7}{2}} \sin(dx+c)^8}{(\cos(dx+c)+1)^8} - \frac{6i a^{\frac{7}{2}} \cdots}{(\cos(\cdots}\right.}{d\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)^{\frac{7}{2}}\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right)^{\frac{7}{2}}\left(-\frac{10i\sin(dx+c)}{\cos(dx+c)+1} - \frac{20\sin(dx+c)^2}{(\cos(dx+c)+1)^2} - \frac{50i\sin(dx+c)^3}{(\cos(dx+c)+1)^3} - \frac{25\sin(dx+c)^4}{(\cos(dx+c)+1)^4} - \frac{100i\sin(dx+c)^5}{(\cos(dx+c)+1)^5} - \cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] 2*(I*a^(7/2) - 6*I*a^(7/2)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 15*I*a^(7/
2)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 20*I*a^(7/2)*sin(d*x + c)^6/(cos(d
*x + c) + 1)^6 + 15*I*a^(7/2)*sin(d*x + c)^8/(cos(d*x + c) + 1)^8 - 6*I*a^(
7/2)*sin(d*x + c)^10/(cos(d*x + c) + 1)^10 + I*a^(7/2)*sin(d*x + c)^12/(cos
(d*x + c) + 1)^12)*(-2*I*sin(d*x + c)/(cos(d*x + c) + 1) + sin(d*x + c)^2/(
cos(d*x + c) + 1)^2 - 1)^(7/2)/(d*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(7/
2)*(sin(d*x + c)/(cos(d*x + c) + 1) - 1)^(7/2)*(-10*I*sin(d*x + c)/(cos(d*x
 + c) + 1) - 20*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 50*I*sin(d*x + c)^3/(
cos(d*x + c) + 1)^3 - 25*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 100*I*sin(d*
x + c)^5/(cos(d*x + c) + 1)^5 - 100*I*sin(d*x + c)^7/(cos(d*x + c) + 1)^7 +
 25*sin(d*x + c)^8/(cos(d*x + c) + 1)^8 - 50*I*sin(d*x + c)^9/(cos(d*x + c)
 + 1)^9 + 20*sin(d*x + c)^10/(cos(d*x + c) + 1)^10 - 10*I*sin(d*x + c)^11/(
cos(d*x + c) + 1)^11 + 5*sin(d*x + c)^12/(cos(d*x + c) + 1)^12 - 5))
```

mupad [B] time = 5.26, size = 112, normalized size = 3.20

$$-\frac{a^3\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}\,\left(-2\,\sin(c+d\,x) - 3\,\sin(3\,c+3\,d\,x) - \sin(5\,c+5\,d\,x) + \cos(c+d\,x)\,4\mathrm{i} + \mathrm{c}\cdots\right.}{20\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^(7/2),x)
```

```
[Out] -(a^3*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) +
 1))^(1/2)*(cos(c + d*x)*4i - 2*sin(c + d*x) + cos(3*c + 3*d*x)*3i + cos(5*
c + 5*d*x)*1i - 3*sin(3*c + 3*d*x) - sin(5*c + 5*d*x)))/(20*d)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**5*(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.330 $\int \cos^7(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx$

Optimal. Leaf size=196

$$\frac{ia^{7/2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{8\sqrt{2}d}-\frac{ia^3\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{8d}-\frac{ia^2\cos^3(c+dx)(a+ia\tan(c+dx))^{3/2}}{12d}-\frac{i\,\mathrm{co}}{}$$

```
[Out] 1/16*I*a^(7/2)*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1
/2))/d*2^(1/2)-1/8*I*a^3*cos(d*x+c)*(a+I*a*tan(d*x+c))^(1/2)/d-1/12*I*a^2*c
os(d*x+c)^3*(a+I*a*tan(d*x+c))^(3/2)/d-1/10*I*a*cos(d*x+c)^5*(a+I*a*tan(d*x
+c))^(5/2)/d-1/7*I*cos(d*x+c)^7*(a+I*a*tan(d*x+c))^(7/2)/d
```

Rubi [A] time = 0.29, antiderivative size = 196, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 3, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.115$, Rules used = {3490, 3489, 206}

$$-\frac{ia^2\cos^3(c+dx)(a+ia\tan(c+dx))^{3/2}}{12d}-\frac{ia^3\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{8d}+\frac{ia^{7/2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{8\sqrt{2}d}-\frac{i\,\mathrm{c}}{}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^7*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] ((I/8)*a^(7/2)*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[c +
 d*x]])])/(Sqrt[2]*d) - ((I/8)*a^3*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])
/d - ((I/12)*a^2*Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^(3/2))/d - ((I/10)*a
*Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^(5/2))/d - ((I/7)*Cos[c + d*x]^7*(a
+ I*a*Tan[c + d*x])^(7/2))/d
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3490

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] + Dist[a/(2*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b*Tan[e +
f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] &&
EqQ[m/2 + n, 0] && GtQ[n, 0]
```

Rubi steps

$$\int \cos^7(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx = -\frac{i\cos^7(c+dx)(a+ia\tan(c+dx))^{7/2}}{7d} + \frac{1}{2}a\int \cos^5(c+dx)(a+ia\tan$$
$$= -\frac{ia\cos^5(c+dx)(a+ia\tan(c+dx))^{5/2}}{10d} - \frac{i\cos^7(c+dx)(a+ia\tan($$
$$= -\frac{ia^2\cos^3(c+dx)(a+ia\tan(c+dx))^{3/2}}{12d} - \frac{ia\cos^5(c+dx)(a+ia\tan$$
$$= -\frac{ia^3\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{8d} - \frac{ia^2\cos^3(c+dx)(a+ia\tan($$
$$= -\frac{ia^3\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{8d} - \frac{ia^2\cos^3(c+dx)(a+ia\tan($$
$$= \frac{ia^{7/2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{8\sqrt{2}d} - \frac{ia^3\cos(c+dx)\sqrt{a+ia\tan(c+d}{8d}$$

Mathematica [A] time = 1.88, size = 131, normalized size = 0.67

$$-\frac{ia^3e^{-i(c+dx)}\left(298e^{2i(c+dx)}+188e^{4i(c+dx)}+81e^{6i(c+dx)}+15e^{8i(c+dx)}-105\sqrt{1+e^{2i(c+dx)}}\tanh^{-1}\left(\sqrt{1+e^{2i(c+dx)}}\right)+}{1680d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^7*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] ((-1/1680*I)*a^3*(176 + 298*E^((2*I)*(c + d*x)) + 188*E^((4*I)*(c + d*x)) +
 81*E^((6*I)*(c + d*x)) + 15*E^((8*I)*(c + d*x)) - 105*Sqrt[1 + E^((2*I)*(c
 + d*x))]*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]])*Sqrt[a + I*a*Tan[c + d*x]
])/(d*E^(I*(c + d*x)))
```

fricas [A] time = 0.58, size = 258, normalized size = 1.32

$$105\sqrt{\frac{1}{2}}\sqrt{-\frac{a^7}{d^2}}\,d\log\left(\frac{\left(ia^4+\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{-\frac{a^7}{d^2}}\left(de^{(2idx+2ic)}+d\right)\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\right)e^{(-idx-ic)}}{4d}\right)-105\sqrt{\frac{1}{2}}\sqrt{-\frac{a^7}{d^2}}\,d\log\left(\frac{\left(ia^4-\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{-\frac{a^7}{d^2}}\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/1680*(105*sqrt(1/2)*sqrt(-a^7/d^2)*d*log(1/4*(I*a^4 + sqrt(2)*sqrt(1/2)*s
qrt(-a^7/d^2)*(d*e^(2*I*d*x + 2*I*c) + d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))
)*e^(-I*d*x - I*c)/d) - 105*sqrt(1/2)*sqrt(-a^7/d^2)*d*log(1/4*(I*a^4 - sqr
t(2)*sqrt(1/2)*sqrt(-a^7/d^2)*(d*e^(2*I*d*x + 2*I*c) + d)*sqrt(a/(e^(2*I*d*
x + 2*I*c) + 1)))*e^(-I*d*x - I*c)/d) + sqrt(2)*(-15*I*a^3*e^(8*I*d*x + 8*I
*c) - 81*I*a^3*e^(6*I*d*x + 6*I*c) - 188*I*a^3*e^(4*I*d*x + 4*I*c) - 298*I*
a^3*e^(2*I*d*x + 2*I*c) - 176*I*a^3)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)))/d
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 1.77, size = 1260, normalized size = 6.43

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] -1/107520/d*(105*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(13/2)*arctanh(1/2*(-2*co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*cos(d*x+c)^6*
sin(d*x+c)*2^(1/2)+630*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(13/2)*arctanh(1/2*
(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*cos(d*x
+c)^5*sin(d*x+c)*2^(1/2)+18432*sin(d*x+c)*cos(d*x+c)^11-7168*sin(d*x+c)*cos
(d*x+c)^9+8960*sin(d*x+c)*cos(d*x+c)^8+6144*sin(d*x+c)*cos(d*x+c)^10-13440*
sin(d*x+c)*cos(d*x+c)^7+122880*I*cos(d*x+c)^14-61440*I*cos(d*x+c)^13-79872*
I*cos(d*x+c)^12+24576*I*cos(d*x+c)^11+1024*I*cos(d*x+c)^10+1792*I*cos(d*x+c
)^9+4480*I*cos(d*x+c)^8-13440*I*cos(d*x+c)^7-122880*sin(d*x+c)*cos(d*x+c)^1
3+61440*sin(d*x+c)*cos(d*x+c)^12+1575*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(13/
2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2
^(1/2))*cos(d*x+c)^4*sin(d*x+c)*2^(1/2)+2100*I*(-2*cos(d*x+c)/(1+cos(d*x+c)
))^(13/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d
*x+c)*2^(1/2))*cos(d*x+c)^3*sin(d*x+c)*2^(1/2)+1575*I*(-2*cos(d*x+c)/(1+cos
(d*x+c)))^(13/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c
)/cos(d*x+c)*2^(1/2))*cos(d*x+c)^2*sin(d*x+c)*2^(1/2)+630*I*(-2*cos(d*x+c)/
(1+cos(d*x+c)))^(13/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin
(d*x+c)/cos(d*x+c)*2^(1/2))*cos(d*x+c)*sin(d*x+c)*2^(1/2)-105*2^(1/2)*arcta
n(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d
*x+c)))^(13/2)*sin(d*x+c)-105*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(13/2)*arctan(
1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*sin(d*x+c)*cos(d*x+c)^6*2
^(1/2)-630*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(13/2)*arctan(1/2*(-2*cos(d*x+c)/
(1+cos(d*x+c)))^(1/2)*2^(1/2))*sin(d*x+c)*cos(d*x+c)^5*2^(1/2)-1575*(-2*cos
(d*x+c)/(1+cos(d*x+c)))^(13/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*2^(1/2))*sin(d*x+c)*cos(d*x+c)^4*2^(1/2)-2100*(-2*cos(d*x+c)/(1+cos(d*x
+c)))^(13/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*sin(d
*x+c)*cos(d*x+c)^3*2^(1/2)-1575*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(13/2)*arcta
n(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*sin(d*x+c)*cos(d*x+c)^2
*2^(1/2)-630*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(13/2)*arctan(1/2*(-2*cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*sin(d*x+c)*cos(d*x+c)*2^(1/2)+105*I*2^(1/2
)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^
(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(13/2)*sin(d*x+c))*(a*(I*sin(d*x+c)+c
os(d*x+c))/cos(d*x+c))^(1/2)/(I*sin(d*x+c)+cos(d*x+c)-1)/cos(d*x+c)^6*a^3
```

maxima [B] time = 1.06, size = 1250, normalized size = 6.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] 1/6720*((-140*I*sqrt(2)*a^3*cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2
*c) + 1)) + 140*sqrt(2)*a^3*sin(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2
*c) + 1)) + (-60*I*sqrt(2)*a^3*cos(2*d*x + 2*c)^2 - 60*I*sqrt(2)*a^3*sin(2*
d*x + 2*c)^2 - 120*I*sqrt(2)*a^3*cos(2*d*x + 2*c) - 60*I*sqrt(2)*a^3)*cos(7
/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 60*(sqrt(2)*a^3*cos(2
*d*x + 2*c)^2 + sqrt(2)*a^3*sin(2*d*x + 2*c)^2 + 2*sqrt(2)*a^3*cos(2*d*x +
2*c) + sqrt(2)*a^3)*sin(7/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)
))*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(3/4)
*sqrt(a) + (-420*I*sqrt(2)*a^3*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c) + 1)) + 420*sqrt(2)*a^3*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c) + 1)) + (-84*I*sqrt(2)*a^3*cos(2*d*x + 2*c)^2 - 84*I*sqrt(2)*a^3*sin
```

```
(2*d*x + 2*c)^2 - 168*I*sqrt(2)*a^3*cos(2*d*x + 2*c) - 84*I*sqrt(2)*a^3)*co
s(5/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 84*(sqrt(2)*a^3*co
s(2*d*x + 2*c)^2 + sqrt(2)*a^3*sin(2*d*x + 2*c)^2 + 2*sqrt(2)*a^3*cos(2*d*x
 + 2*c) + sqrt(2)*a^3)*sin(5/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) +
 1)))*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1
/4)*sqrt(a) - (210*sqrt(2)*a^3*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*
c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(
2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x
+ 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))
+ 1) - 210*sqrt(2)*a^3*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2
*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) +
 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 1) - 1
05*I*sqrt(2)*a^3*log(sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2
*d*x + 2*c) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2
 + sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*s
in(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + 2*(cos(2*d*x +
2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2
(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1) + 105*I*sqrt(2)*a^3*log(sqrt
(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*cos(1/2*
arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + sqrt(cos(2*d*x + 2*c)^
2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*sin(1/2*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c) + 1))^2 - 2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)
^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*
d*x + 2*c) + 1)) + 1))*sqrt(a))/d
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \cos (c + d\,x)^7\,(a + a\tan (c + d\,x)\,1\mathrm{i})^{7/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^7*(a + a*tan(c + d*x)*1i)^(7/2),x)
[Out] int(cos(c + d*x)^7*(a + a*tan(c + d*x)*1i)^(7/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**7*(a+I*a*tan(d*x+c))**(7/2),x)
[Out] Timed out
```

3.331 $\int \cos^9(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx$

Optimal. Leaf size=268

$$\frac{11ia^{7/2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{64\sqrt{2}d}+\frac{11ia^4\cos(c+dx)}{96d\sqrt{a+ia\tan(c+dx)}}-\frac{11ia^3\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{120d}-\frac{11ia^3\cos(c$$

[Out] 11/128*I*a^(7/2)*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2))/d*2^(1/2)+11/96*I*a^4*cos(d*x+c)/d/(a+I*a*tan(d*x+c))^(1/2)-11/64*I*a^3*cos(d*x+c)*(a+I*a*tan(d*x+c))^(1/2)/d-11/120*I*a^3*cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(1/2)/d-11/140*I*a^2*cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(3/2)/d-11/126*I*a*cos(d*x+c)^7*(a+I*a*tan(d*x+c))^(5/2)/d-1/9*I*cos(d*x+c)^9*(a+I*a*tan(d*x+c))^(7/2)/d

Rubi [A] time = 0.41, antiderivative size = 268, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {3497, 3502, 3490, 3489, 206}

$$-\frac{11ia^2\cos^5(c+dx)(a+ia\tan(c+dx))^{3/2}}{140d}-\frac{11ia^3\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{120d}-\frac{11ia^3\cos(c+dx)\sqrt{a+ia\tan(}}{64d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^9*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((11*I)/64)*a^(7/2)*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*T
an[c + d*x]])])/(Sqrt[2]*d) + (((11*I)/96)*a^4*Cos[c + d*x])/(d*Sqrt[a + I*
a*Tan[c + d*x]]) - (((11*I)/64)*a^3*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]]
)/d - (((11*I)/120)*a^3*Cos[c + d*x]^3*Sqrt[a + I*a*Tan[c + d*x]])/d - (((1
1*I)/140)*a^2*Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^(3/2))/d - (((11*I)/126
)*a*Cos[c + d*x]^7*(a + I*a*Tan[c + d*x])^(5/2))/d - ((I/9)*Cos[c + d*x]^9*
(a + I*a*Tan[c + d*x])^(7/2))/d
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3490

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] + Dist[a/(2*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b*Tan[e +
f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] &&
EqQ[m/2 + n, 0] && GtQ[n, 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
```

```
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$
\begin{aligned}
\int \cos^9(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx &= -\frac{i\cos^9(c+dx)(a+ia\tan(c+dx))^{7/2}}{9d}+\frac{1}{18}(11a)\int \cos^7(c+dx)(a \\
&= -\frac{11ia\cos^7(c+dx)(a+ia\tan(c+dx))^{5/2}}{126d}-\frac{i\cos^9(c+dx)(a+ia\,\mathrm{ta}}{9d} \\
&= -\frac{11ia^2\cos^5(c+dx)(a+ia\tan(c+dx))^{3/2}}{140d}-\frac{11ia\cos^7(c+dx)(a+}{126d} \\
&= -\frac{11ia^3\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{120d}-\frac{11ia^2\cos^5(c+dx)(a+i}{140d} \\
&= \frac{11ia^4\cos(c+dx)}{96d\sqrt{a+ia\tan(c+dx)}}-\frac{11ia^3\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{120d}- \\
&= \frac{11ia^4\cos(c+dx)}{96d\sqrt{a+ia\tan(c+dx)}}-\frac{11ia^3\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{64d}- \\
&= \frac{11ia^4\cos(c+dx)}{96d\sqrt{a+ia\tan(c+dx)}}-\frac{11ia^3\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{64d}- \\
&= \frac{11ia^{7/2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{64\sqrt{2}\,d}+\frac{11ia^4\cos(c+dx)}{96d\sqrt{a+ia\tan(c+dx)}}-\frac{11i}{}
\end{aligned}
$$

Mathematica [A] time = 3.33, size = 188, normalized size = 0.70

$$
-\frac{ia^3e^{-3i(c+dx)}\sqrt{\frac{ae^{2i(c+dx)}}{1+e^{2i(c+dx)}}}\left(4303e^{2i(c+dx)}+7034e^{4i(c+dx)}+3754e^{6i(c+dx)}+1798e^{8i(c+dx)}+530e^{10i(c+dx)}+70e^{12i(c+}\right.}{20160\sqrt{2}\,d}
$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^9*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] ((-1/20160*I)*a^3*Sqrt[(a*E^((2*I)*(c + d*x)))/(1 + E^((2*I)*(c + d*x)))]*(
-315 + 4303*E^((2*I)*(c + d*x)) + 7034*E^((4*I)*(c + d*x)) + 3754*E^((6*I)*
(c + d*x)) + 1798*E^((8*I)*(c + d*x)) + 530*E^((10*I)*(c + d*x)) + 70*E^((1
2*I)*(c + d*x)) - 3465*E^((2*I)*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))]*Ar
cTanh[Sqrt[1 + E^((2*I)*(c + d*x))]]))/(Sqrt[2]*d*E^((3*I)*(c + d*x)))
```

fricas [A] time = 1.41, size = 314, normalized size = 1.17

$$
-\frac{\left(3465\sqrt{\frac{1}{2}}\sqrt{-\frac{a^7}{d^2}}\,de^{(2i\,dx+2i\,c)}\log\left(-\frac{11\left(-i\,a^4+\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{-\frac{a^7}{d^2}}\left(de^{(2i\,dx+2i\,c)}+d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\right)e^{(-i\,dx-i\,c)}}{32\,d}\right)-3465\sqrt{\frac{1}{2}}\sqrt{-\frac{a^7}{d^2}}\,de^{(}\right.}{}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] -1/40320*(3465*sqrt(1/2)*sqrt(-a^7/d^2)*d*e^(2*I*d*x + 2*I*c)*log(-11/32*(-
I*a^4 + sqrt(2)*sqrt(1/2)*sqrt(-a^7/d^2)*(d*e^(2*I*d*x + 2*I*c) + d)*sqrt(a
/(e^(2*I*d*x + 2*I*c) + 1)))*e^(-I*d*x - I*c)/d) - 3465*sqrt(1/2)*sqrt(-a^7
/d^2)*d*e^(2*I*d*x + 2*I*c)*log(-11/32*(-I*a^4 - sqrt(2)*sqrt(1/2)*sqrt(-a^
7/d^2)*(d*e^(2*I*d*x + 2*I*c) + d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)))*e^(-I
*d*x - I*c)/d) - sqrt(2)*(-70*I*a^3*e^(12*I*d*x + 12*I*c) - 530*I*a^3*e^(10
*I*d*x + 10*I*c) - 1798*I*a^3*e^(8*I*d*x + 8*I*c) - 3754*I*a^3*e^(6*I*d*x +
 6*I*c) - 7034*I*a^3*e^(4*I*d*x + 4*I*c) - 4303*I*a^3*e^(2*I*d*x + 2*I*c) +
 315*I*a^3)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)))*e^(-2*I*d*x - 2*I*c)/d
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 2.24, size = 1604, normalized size = 5.99

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] -1/10321920/d*(3465*I*cos(d*x+c)^8*sin(d*x+c)*arctanh(1/2*(-2*cos(d*x+c)/(1
+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*
x+c)))^(17/2)*2^(1/2)-242550*cos(d*x+c)^4*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(
d*x+c)))^(17/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^
(1/2)-194040*cos(d*x+c)^3*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(17/2)*
arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)-97020*cos(
d*x+c)^2*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(17/2)*arctan(1/2*(-2*co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)-27720*cos(d*x+c)*sin(d*x+c)
*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(17/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x
+c)))^(1/2)*2^(1/2))*2^(1/2)+27720*I*cos(d*x+c)^7*sin(d*x+c)*arctanh(1/2*(-
2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d
*x+c)/(1+cos(d*x+c)))^(17/2)*2^(1/2)-946176*sin(d*x+c)*cos(d*x+c)^11-177408
0*sin(d*x+c)*cos(d*x+c)^9+1182720*sin(d*x+c)*cos(d*x+c)^10-720896*sin(d*x+c
)*cos(d*x+c)^13+811008*sin(d*x+c)*cos(d*x+c)^12-3465*2^(1/2)*arctan(1/2*(-2
*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(
17/2)*sin(d*x+c)+97020*I*cos(d*x+c)^6*sin(d*x+c)*arctanh(1/2*(-2*cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos
(d*x+c)))^(17/2)*2^(1/2)+194040*I*cos(d*x+c)^5*sin(d*x+c)*arctanh(1/2*(-2*c
os(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+
c)/(1+cos(d*x+c)))^(17/2)*2^(1/2)+242550*I*cos(d*x+c)^4*sin(d*x+c)*arctanh(
1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2
*cos(d*x+c)/(1+cos(d*x+c)))^(17/2)*2^(1/2)+194040*I*cos(d*x+c)^3*sin(d*x+c)
*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(
1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(17/2)*2^(1/2)+97020*I*cos(d*x+c)^2*si
n(d*x+c)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*
x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(17/2)*2^(1/2)+27720*I*cos(d*x
+c)*sin(d*x+c)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/
cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(17/2)*2^(1/2)+3465*I*(-
2*cos(d*x+c)/(1+cos(d*x+c)))^(17/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*2^(1/2)*sin(d*x+c)-3465*cos(d*x+c)
```

```
^8*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(17/2)*arctan(1/2*(-2*cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)-27720*cos(d*x+c)^7*sin(d*x+c)*(-2
*cos(d*x+c)/(1+cos(d*x+c)))^(17/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)*2^(1/2))*2^(1/2)-97020*cos(d*x+c)^6*sin(d*x+c)*(-2*cos(d*x+c)/(1+co
s(d*x+c)))^(17/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*
2^(1/2)-194040*cos(d*x+c)^5*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(17/2
)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)-9175040*
cos(d*x+c)^17*sin(d*x+c)+4587520*cos(d*x+c)^16*sin(d*x+c)+983040*cos(d*x+c)
^15*sin(d*x+c)+655360*cos(d*x+c)^14*sin(d*x+c)+9175040*I*cos(d*x+c)^18-4587
520*I*cos(d*x+c)^17-5570560*I*cos(d*x+c)^16+1638400*I*cos(d*x+c)^15+65536*I
*cos(d*x+c)^14+90112*I*cos(d*x+c)^13+135168*I*cos(d*x+c)^12+236544*I*cos(d*
x+c)^11+591360*I*cos(d*x+c)^10-1774080*I*cos(d*x+c)^9)*(a*(I*sin(d*x+c)+cos
(d*x+c))/cos(d*x+c))^(1/2)/(I*sin(d*x+c)+cos(d*x+c)-1)/cos(d*x+c)^8*a^3
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^9*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \cos\left(c+d\,x\right)^9\,{\left(a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^{7/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^9*(a + a*tan(c + d*x)*1i)^(7/2),x)
[Out] int(cos(c + d*x)^9*(a + a*tan(c + d*x)*1i)^(7/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**9*(a+I*a*tan(d*x+c))**(7/2),x)
[Out] Timed out
```

3.332 $\int \cos^{11}(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx$

Optimal. Leaf size=342

$$\frac{195ia^{7/2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{1024\sqrt{2}\,d}+\frac{39ia^4\cos^3(c+dx)}{448d\sqrt{a+ia\tan(c+dx)}}+\frac{65ia^4\cos(c+dx)}{512d\sqrt{a+ia\tan(c+dx)}}-\frac{13ia^3\cos^5(c+dx)\sqrt{a}}{168d}$$

```
[Out] 195/2048*I*a^(7/2)*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c)
)^(1/2))/d*2^(1/2)+65/512*I*a^4*cos(d*x+c)/d/(a+I*a*tan(d*x+c))^(1/2)+39/44
8*I*a^4*cos(d*x+c)^3/d/(a+I*a*tan(d*x+c))^(1/2)-195/1024*I*a^3*cos(d*x+c)*(
a+I*a*tan(d*x+c))^(1/2)/d-13/128*I*a^3*cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(1/2
)/d-13/168*I*a^3*cos(d*x+c)^5*(a+I*a*tan(d*x+c))^(1/2)/d-65/924*I*a^2*cos(d
*x+c)^7*(a+I*a*tan(d*x+c))^(3/2)/d-5/66*I*a*cos(d*x+c)^9*(a+I*a*tan(d*x+c))
^(5/2)/d-1/11*I*cos(d*x+c)^11*(a+I*a*tan(d*x+c))^(7/2)/d
```

Rubi [A] time = 0.56, antiderivative size = 342, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = {3497, 3502, 3490, 3489, 206}

$$-\frac{65ia^2\cos^7(c+dx)(a+ia\tan(c+dx))^{3/2}}{924d}-\frac{13ia^3\cos^5(c+dx)\sqrt{a+ia\tan(c+dx)}}{168d}-\frac{13ia^3\cos^3(c+dx)\sqrt{a+ia\tan}}{128d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^11*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((195*I)/1024)*a^(7/2)*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*
a*Tan[c + d*x]])])/(Sqrt[2]*d) + (((65*I)/512)*a^4*Cos[c + d*x])/(d*Sqrt[a
+ I*a*Tan[c + d*x]]) + (((39*I)/448)*a^4*Cos[c + d*x]^3)/(d*Sqrt[a + I*a*Ta
n[c + d*x]]) - (((195*I)/1024)*a^3*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])
/d - (((13*I)/128)*a^3*Cos[c + d*x]^3*Sqrt[a + I*a*Tan[c + d*x]])/d - (((13
*I)/168)*a^3*Cos[c + d*x]^5*Sqrt[a + I*a*Tan[c + d*x]])/d - (((65*I)/924)*a
^2*Cos[c + d*x]^7*(a + I*a*Tan[c + d*x])^(3/2))/d - (((5*I)/66)*a*Cos[c + d
*x]^9*(a + I*a*Tan[c + d*x])^(5/2))/d - ((I/11)*Cos[c + d*x]^11*(a + I*a*Ta
n[c + d*x])^(7/2))/d
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3490

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] + Dist[a/(2*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b*Tan[e +
f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] &&
EqQ[m/2 + n, 0] && GtQ[n, 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \cos^{11}(c+dx)(a+ia\tan(c+dx))^{7/2}\,dx = -\frac{i\cos^{11}(c+dx)(a+ia\tan(c+dx))^{7/2}}{11d} + \frac{1}{22}(15a)\int \cos^9(c+dx)($$

$$= -\frac{5ia\cos^9(c+dx)(a+ia\tan(c+dx))^{5/2}}{66d} - \frac{i\cos^{11}(c+dx)(a+ia\,\mathrm{ta}}{11d}$$

$$= -\frac{65ia^2\cos^7(c+dx)(a+ia\tan(c+dx))^{3/2}}{924d} - \frac{5ia\cos^9(c+dx)(a+}{66d}$$

$$= -\frac{13ia^3\cos^5(c+dx)\sqrt{a+ia\tan(c+dx)}}{168d} - \frac{65ia^2\cos^7(c+dx)(a+}{924d}$$

$$= \frac{39ia^4\cos^3(c+dx)}{448d\sqrt{a+ia\tan(c+dx)}} - \frac{13ia^3\cos^5(c+dx)\sqrt{a+ia\tan(c+dx}}{168d}$$

$$= \frac{39ia^4\cos^3(c+dx)}{448d\sqrt{a+ia\tan(c+dx)}} - \frac{13ia^3\cos^3(c+dx)\sqrt{a+ia\tan(c+dx}}{128d}$$

$$= \frac{65ia^4\cos(c+dx)}{512d\sqrt{a+ia\tan(c+dx)}} + \frac{39ia^4\cos^3(c+dx)}{448d\sqrt{a+ia\tan(c+dx)}} - \frac{13ia^3\cos}{}$$

$$= \frac{65ia^4\cos(c+dx)}{512d\sqrt{a+ia\tan(c+dx)}} + \frac{39ia^4\cos^3(c+dx)}{448d\sqrt{a+ia\tan(c+dx)}} - \frac{195ia^3\mathrm{co}}{}$$

$$= \frac{65ia^4\cos(c+dx)}{512d\sqrt{a+ia\tan(c+dx)}} + \frac{39ia^4\cos^3(c+dx)}{448d\sqrt{a+ia\tan(c+dx)}} - \frac{195ia^3\mathrm{co}}{}$$

$$= \frac{195ia^{7/2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{1024\sqrt{2}\,d} + \frac{65ia^4\cos(c+dx)}{512d\sqrt{a+ia\tan(c+dx)}} +$$

Mathematica [A] time = 6.55, size = 194, normalized size = 0.57

$$-\frac{ia^3e^{-5i(c+dx)}\left(-7161e^{2i(c+dx)}+47413e^{4i(c+dx)}+78800e^{6i(c+dx)}+38512e^{8i(c+dx)}+19552e^{10i(c+dx)}+7184e^{12i(c+dx}\right.}{4}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^11*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] ((-1/473088*I)*a^3*(-462 - 7161*E^((2*I)*(c + d*x)) + 47413*E^((4*I)*(c + d
*x)) + 78800*E^((6*I)*(c + d*x)) + 38512*E^((8*I)*(c + d*x)) + 19552*E^((10
*I)*(c + d*x)) + 7184*E^((12*I)*(c + d*x)) + 1624*E^((14*I)*(c + d*x)) + 16
```

```
8*E^((16*I)*(c + d*x)) - 45045*E^((4*I)*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d
*x))]*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]])*Sqrt[a + I*a*Tan[c + d*x]])/(
d*E^((5*I)*(c + d*x)))
```

fricas [A] time = 0.79, size = 342, normalized size = 1.00

$$-\frac{\left(45045\sqrt{\frac{1}{2}}\sqrt{-\frac{a^7}{d^2}}\,de^{(4i\,dx+4i\,c)}\log\left(-\frac{195\left(-i\,a^4+\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{-\frac{a^7}{d^2}}\left(de^{(2i\,dx+2i\,c)}+d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\right)e^{(-i\,dx-i\,c)}}{512\,d}\right)-45045\sqrt{\frac{1}{2}}\sqrt{-\frac{a^7}{d^2}}\,de$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^11*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] -1/473088*(45045*sqrt(1/2)*sqrt(-a^7/d^2)*d*e^(4*I*d*x + 4*I*c)*log(-195/51
2*(-I*a^4 + sqrt(2)*sqrt(1/2)*sqrt(-a^7/d^2)*(d*e^(2*I*d*x + 2*I*c) + d)*sq
rt(a/(e^(2*I*d*x + 2*I*c) + 1)))*e^(-I*d*x - I*c)/d) - 45045*sqrt(1/2)*sqrt
(-a^7/d^2)*d*e^(4*I*d*x + 4*I*c)*log(-195/512*(-I*a^4 - sqrt(2)*sqrt(1/2)*s
qrt(-a^7/d^2)*(d*e^(2*I*d*x + 2*I*c) + d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))
)*e^(-I*d*x - I*c)/d) - sqrt(2)*(-168*I*a^3*e^(16*I*d*x + 16*I*c) - 1624*I*
a^3*e^(14*I*d*x + 14*I*c) - 7184*I*a^3*e^(12*I*d*x + 12*I*c) - 19552*I*a^3*
e^(10*I*d*x + 10*I*c) - 38512*I*a^3*e^(8*I*d*x + 8*I*c) - 78800*I*a^3*e^(6*
I*d*x + 6*I*c) - 47413*I*a^3*e^(4*I*d*x + 4*I*c) + 7161*I*a^3*e^(2*I*d*x +
2*I*c) + 462*I*a^3)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)))*e^(-4*I*d*x - 4*I*c)
/d
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^11*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 3.65, size = 1948, normalized size = 5.70

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^11*(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] -1/484442112/d*(11351340*I*2^(1/2)*cos(d*x+c)^5*sin(d*x+c)*arctanh(1/2*(-2*
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x
+c)/(1+cos(d*x+c)))^(21/2)-45045*2^(1/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d
*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(21/2)*sin(d*x+c)-945
9450*2^(1/2)*cos(d*x+c)^4*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(21/2)*
arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))-5405400*2^(1/2)*co
s(d*x+c)^3*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(21/2)*arctan(1/2*(-2*
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))-2027025*2^(1/2)*cos(d*x+c)^2*sin(
d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(21/2)*arctan(1/2*(-2*cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)*2^(1/2))-450450*2^(1/2)*cos(d*x+c)*sin(d*x+c)*(-2*cos(d*x
+c)/(1+cos(d*x+c)))^(21/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*
2^(1/2))+45045*I*2^(1/2)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*s
in(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(21/2)*sin(d*x
+c)-45045*2^(1/2)*cos(d*x+c)^10*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(
21/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))-450450*2^(1/
2)*cos(d*x+c)^9*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(21/2)*arctan(1/2
*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))-2027025*2^(1/2)*cos(d*x+c)^8
```

```
*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(21/2)*arctan(1/2*(-2*cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*2^(1/2))+5405400*I*2^(1/2)*cos(d*x+c)^7*sin(d*x+c)*a
rctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/
2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(21/2)+45045*I*2^(1/2)*cos(d*x+c)^10*sin
(d*x+c)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x
+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(21/2)+450450*I*2^(1/2)*cos(d*x
+c)^9*sin(d*x+c)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c
)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(21/2)+2027025*I*2^(1/
2)*cos(d*x+c)^8*sin(d*x+c)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(21/2)+45045
0*I*2^(1/2)*cos(d*x+c)*sin(d*x+c)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(21/2
)+9459450*I*2^(1/2)*cos(d*x+c)^4*sin(d*x+c)*arctanh(1/2*(-2*cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+
c)))^(21/2)-5405400*2^(1/2)*cos(d*x+c)^7*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d
*x+c)))^(21/2)*arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))-945
9450*2^(1/2)*cos(d*x+c)^6*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(21/2)*
arctan(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))-11351340*2^(1/2)*c
os(d*x+c)^5*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(21/2)*arctan(1/2*(-2
*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))+9459450*I*2^(1/2)*cos(d*x+c)^6*s
in(d*x+c)*arctanh(1/2*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d
*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(21/2)-92252160*sin(d*x+c)*co
s(d*x+c)^11-49201152*sin(d*x+c)*cos(d*x+c)^13+61501440*sin(d*x+c)*cos(d*x+c
)^12+5405400*I*2^(1/2)*cos(d*x+c)^3*sin(d*x+c)*arctanh(1/2*(-2*cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d
*x+c)))^(21/2)+2027025*I*2^(1/2)*cos(d*x+c)^2*sin(d*x+c)*arctanh(1/2*(-2*co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)/cos(d*x+c)*2^(1/2))*(-2*cos(d*x+c
)/(1+cos(d*x+c)))^(21/2)+30750720*I*cos(d*x+c)^12-92252160*I*cos(d*x+c)^11-
352321536*cos(d*x+c)^21*sin(d*x+c)+176160768*cos(d*x+c)^20*sin(d*x+c)+29360
128*cos(d*x+c)^19*sin(d*x+c)+29360128*cos(d*x+c)^18*sin(d*x+c)+352321536*I*
cos(d*x+c)^22-176160768*I*cos(d*x+c)^21-205520896*I*cos(d*x+c)^20+58720256*
I*cos(d*x+c)^19+2097152*I*cos(d*x+c)^18+2621440*I*cos(d*x+c)^17+3407872*I*c
os(d*x+c)^16+4685824*I*cos(d*x+c)^15+7028736*I*cos(d*x+c)^14+12300288*I*cos
(d*x+c)^13-31457280*cos(d*x+c)^17*sin(d*x+c)+34078720*cos(d*x+c)^16*sin(d*x
+c)-37486592*cos(d*x+c)^15*sin(d*x+c)+42172416*cos(d*x+c)^14*sin(d*x+c))*(a
*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/(I*sin(d*x+c)+cos(d*x+c)-1)/co
s(d*x+c)^10*a^3
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^11*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \cos(c + d\,x)^{11}\,(a + a\tan(c + d\,x)\,1\mathrm{i})^{7/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^11*(a + a*tan(c + d*x)*1i)^(7/2),x)
[Out] int(cos(c + d*x)^11*(a + a*tan(c + d*x)*1i)^(7/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**11*(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.333 $\int \frac{\sec^8(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=117

$$\frac{2i(a+ia\tan(c+dx))^{13/2}}{13a^7d}-\frac{12i(a+ia\tan(c+dx))^{11/2}}{11a^6d}+\frac{8i(a+ia\tan(c+dx))^{9/2}}{3a^5d}-\frac{16i(a+ia\tan(c+dx))^{7/2}}{7a^4d}$$

```
[Out] -16/7*I*(a+I*a*tan(d*x+c))^(7/2)/a^4/d+8/3*I*(a+I*a*tan(d*x+c))^(9/2)/a^5/d
-12/11*I*(a+I*a*tan(d*x+c))^(11/2)/a^6/d+2/13*I*(a+I*a*tan(d*x+c))^(13/2)/a
^7/d
```

Rubi [A] time = 0.08, antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 43}

$$\frac{2i(a+ia\tan(c+dx))^{13/2}}{13a^7d}-\frac{12i(a+ia\tan(c+dx))^{11/2}}{11a^6d}+\frac{8i(a+ia\tan(c+dx))^{9/2}}{3a^5d}-\frac{16i(a+ia\tan(c+dx))^{7/2}}{7a^4d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^8/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((-16*I)/7)*(a + I*a*Tan[c + d*x])^(7/2))/(a^4*d) + (((8*I)/3)*(a + I*a*Ta
n[c + d*x])^(9/2))/(a^5*d) - (((12*I)/11)*(a + I*a*Tan[c + d*x])^(11/2))/(a
^6*d) + (((2*I)/13)*(a + I*a*Tan[c + d*x])^(13/2))/(a^7*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^8(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^3(a+x)^{5/2}\,dx, x, ia\tan(c+dx)\right)}{a^7d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(8a^3(a+x)^{5/2}-12a^2(a+x)^{7/2}+6a(a+x)^{9/2}-(a+x)^{11/2}\right)dx, x, ia\tan\right.}{a^7d}\\ &= -\frac{16i(a+ia\tan(c+dx))^{7/2}}{7a^4d}+\frac{8i(a+ia\tan(c+dx))^{9/2}}{3a^5d}-\frac{12i(a+ia\tan(c+dx))^{11}}{11a^6d}\end{aligned}$$

Mathematica [A] time = 0.63, size = 95, normalized size = 0.81

$$\frac{2\sec^7(c+dx)(-7i(26\sin(c+dx)+59\sin(3(c+dx)))+390\cos(c+dx)+445\cos(3(c+dx)))(\sin(4(c+dx))}{3003d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^8/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (2*Sec[c + d*x]^7*(390*Cos[c + d*x] + 445*Cos[3*(c + d*x)] - (7*I)*(26*Sin[
c + d*x] + 59*Sin[3*(c + d*x)]))*((-I)*Cos[4*(c + d*x)] + Sin[4*(c + d*x)])
)/(3003*d*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 1.93, size = 150, normalized size = 1.28

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(-2048i\,e^{(13i\,dx+13i\,c)}-13312i\,e^{(11i\,dx+11i\,c)}-36608i\,e^{(9i\,dx+9i\,c)}-54912i\,e^{(7i\,dx+7i\,c)}\right)}{3003\left(ade^{(12i\,dx+12i\,c)}+6\,ade^{(10i\,dx+10i\,c)}+15\,ade^{(8i\,dx+8i\,c)}+20\,ade^{(6i\,dx+6i\,c)}+15\,ade^{(4i\,dx+4i\,c)}+6\,ade^{(2i\,dx+2i\,c)}+ad\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/3003*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-2048*I*e^(13*I*d*x + 13*
I*c) - 13312*I*e^(11*I*d*x + 11*I*c) - 36608*I*e^(9*I*d*x + 9*I*c) - 54912*
I*e^(7*I*d*x + 7*I*c))/(a*d*e^(12*I*d*x + 12*I*c) + 6*a*d*e^(10*I*d*x + 10*
I*c) + 15*a*d*e^(8*I*d*x + 8*I*c) + 20*a*d*e^(6*I*d*x + 6*I*c) + 15*a*d*e^(
4*I*d*x + 4*I*c) + 6*a*d*e^(2*I*d*x + 2*I*c) + a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec\left(dx+c\right)^{8}}{\sqrt{i\,a\tan\left(dx+c\right)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^8/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [A] time = 1.81, size = 127, normalized size = 1.09

$$-\frac{2\left(512i\left(\cos^{6}\left(dx+c\right)\right)-512\left(\cos^{5}\left(dx+c\right)\right)\sin\left(dx+c\right)+64i\left(\cos^{4}\left(dx+c\right)\right)-320\left(\cos^{3}\left(dx+c\right)\right)\sin\left(dx+c\right)\right.}{3003d\cos\left(dx+c\right)^{6}a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] -2/3003/d*(512*I*cos(d*x+c)^6-512*cos(d*x+c)^5*sin(d*x+c)+64*I*cos(d*x+c)^4
-320*cos(d*x+c)^3*sin(d*x+c)+28*I*cos(d*x+c)^2-252*cos(d*x+c)*sin(d*x+c)+23
1*I)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^6/a
```

maxima [B] time = 0.77, size = 297, normalized size = 2.54

$$-\frac{2i\left(15015\sqrt{i\,a\tan\left(dx+c\right)+a}-\frac{3003\left(3\left(i\,a\tan(dx+c)+a\right)^{\frac{5}{2}}-10\left(i\,a\tan(dx+c)+a\right)^{\frac{3}{2}}a+15\sqrt{i\,a\tan(dx+c)+a}\,a^{2}\right)}{a^{2}}+\frac{143\left(35\left(i\,a\tan(dx+c)\right.\right.}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -2/15015*I*(15015*sqrt(I*a*tan(d*x + c) + a) - 3003*(3*(I*a*tan(d*x + c) +
a)^(5/2) - 10*(I*a*tan(d*x + c) + a)^(3/2)*a + 15*sqrt(I*a*tan(d*x + c) + a
)*a^2)/a^2 + 143*(35*(I*a*tan(d*x + c) + a)^(9/2) - 180*(I*a*tan(d*x + c) +
 a)^(7/2)*a + 378*(I*a*tan(d*x + c) + a)^(5/2)*a^2 - 420*(I*a*tan(d*x + c)
```

```
+ a)^(3/2)*a^3 + 315*sqrt(I*a*tan(d*x + c) + a)*a^4)/a^4 - 5*(231*(I*a*tan(
d*x + c) + a)^(13/2) - 1638*(I*a*tan(d*x + c) + a)^(11/2)*a + 5005*(I*a*tan
(d*x + c) + a)^(9/2)*a^2 - 8580*(I*a*tan(d*x + c) + a)^(7/2)*a^3 + 9009*(I*
a*tan(d*x + c) + a)^(5/2)*a^4 - 6006*(I*a*tan(d*x + c) + a)^(3/2)*a^5 + 300
3*sqrt(I*a*tan(d*x + c) + a)*a^6)/a^6)/(a*d)
```

mupad [B] time = 8.94, size = 434, normalized size = 3.71

$$-\frac{\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,2048i}{3003\,a\,d}-\frac{\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,1024i}{3003\,a\,d\,\left(e^{c\,2i+d\,x\,2i}+1\right)}-\frac{\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,256i}{1001\,a\,d\,\left(e^{c\,2i+d\,x\,2i}+1\right)^2}-\frac{\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right.}{e^{c\,2i+d\,x\,2i}+1}}}{3003\,a\,d\,\left(e^{c\,2i+d\,x\,2\right.}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^8*(a + a*tan(c + d*x)*1i)^(1/2)),x)
```

```
[Out] ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*6
784i)/(429*a*d*(exp(c*2i + d*x*2i) + 1)^4) - ((a - (a*(exp(c*2i + d*x*2i)*1
i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*1024i)/(3003*a*d*(exp(c*2i + d*
x*2i) + 1)) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i)
 + 1))^(1/2)*256i)/(1001*a*d*(exp(c*2i + d*x*2i) + 1)^2) - ((a - (a*(exp(c*
2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*640i)/(3003*a*d*(
exp(c*2i + d*x*2i) + 1)^3) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp
(c*2i + d*x*2i) + 1))^(1/2)*2048i)/(3003*a*d) - ((a - (a*(exp(c*2i + d*x*2i
)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*3456i)/(143*a*d*(exp(c*2i +
d*x*2i) + 1)^5) + ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x
*2i) + 1))^(1/2)*128i)/(13*a*d*(exp(c*2i + d*x*2i) + 1)^6)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^8(c+dx)}{\sqrt{ia\,(\tan(c+dx)-i)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(sec(c + d*x)**8/sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.334 $\int \frac{\sec^6(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=88

$$-\frac{2i(a+ia\tan(c+dx))^{9/2}}{9a^5d}+\frac{8i(a+ia\tan(c+dx))^{7/2}}{7a^4d}-\frac{8i(a+ia\tan(c+dx))^{5/2}}{5a^3d}$$

```
[Out] -8/5*I*(a+I*a*tan(d*x+c))^(5/2)/a^3/d+8/7*I*(a+I*a*tan(d*x+c))^(7/2)/a^4/d-
2/9*I*(a+I*a*tan(d*x+c))^(9/2)/a^5/d
```

Rubi [A] time = 0.07, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {3487, 43}

$$-\frac{2i(a+ia\tan(c+dx))^{9/2}}{9a^5d}+\frac{8i(a+ia\tan(c+dx))^{7/2}}{7a^4d}-\frac{8i(a+ia\tan(c+dx))^{5/2}}{5a^3d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((-8*I)/5)*(a + I*a*Tan[c + d*x])^(5/2))/(a^3*d) + (((8*I)/7)*(a + I*a*Tan
[c + d*x])^(7/2))/(a^4*d) - (((2*I)/9)*(a + I*a*Tan[c + d*x])^(9/2))/(a^5*d
)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sec^6(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^2(a+x)^{3/2}\,dx, x, ia\tan(c+dx)\right)}{a^5d}\\
&= -\frac{i\,\text{Subst}\left(\int \left(4a^2(a+x)^{3/2}-4a(a+x)^{5/2}+(a+x)^{7/2}\right)dx, x, ia\tan(c+dx)\right)}{a^5d}\\
&= -\frac{8i(a+ia\tan(c+dx))^{5/2}}{5a^3d}+\frac{8i(a+ia\tan(c+dx))^{7/2}}{7a^4d}-\frac{2i(a+ia\tan(c+dx))^{9/2}}{9a^5d}
\end{aligned}$$

Mathematica [A] time = 0.37, size = 77, normalized size = 0.88

$$\frac{2\sec^5(c+dx)(-55i\sin(2(c+dx))+71\cos(2(c+dx))+36)(\sin(3(c+dx))-i\cos(3(c+dx)))}{315d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (2*Sec[c + d*x]^5*(36 + 71*Cos[2*(c + d*x)] - (55*I)*Sin[2*(c + d*x)])*((-I
)*Cos[3*(c + d*x)] + Sin[3*(c + d*x)]))/(315*d*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.78, size = 113, normalized size = 1.28

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(-256i\,e^{(9i\,dx+9i\,c)} - 1152i\,e^{(7i\,dx+7i\,c)} - 2016i\,e^{(5i\,dx+5i\,c)}\right)}{315\left(ade^{(8i\,dx+8i\,c)} + 4\,ade^{(6i\,dx+6i\,c)} + 6\,ade^{(4i\,dx+4i\,c)} + 4\,ade^{(2i\,dx+2i\,c)} + ad\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/315*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-256*I*e^(9*I*d*x + 9*I*c)
 - 1152*I*e^(7*I*d*x + 7*I*c) - 2016*I*e^(5*I*d*x + 5*I*c))/(a*d*e^(8*I*d*x
 + 8*I*c) + 4*a*d*e^(6*I*d*x + 6*I*c) + 6*a*d*e^(4*I*d*x + 4*I*c) + 4*a*d*e
^(2*I*d*x + 2*I*c) + a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec\left(dx+c\right)^{6}}{\sqrt{i\,a\tan\left(dx+c\right)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^6/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [A] time = 1.29, size = 100, normalized size = 1.14

$$-\frac{2\left(64i\left(\cos^{4}\left(dx+c\right)\right) - 64\left(\cos^{3}\left(dx+c\right)\right)\sin\left(dx+c\right) + 8i\left(\cos^{2}\left(dx+c\right)\right) - 40\cos\left(dx+c\right)\sin\left(dx+c\right) + 35}{315d\cos\left(dx+c\right)^{4}a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] -2/315/d*(64*I*cos(d*x+c)^4-64*cos(d*x+c)^3*sin(d*x+c)+8*I*cos(d*x+c)^2-40*
cos(d*x+c)*sin(d*x+c)+35*I)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/
cos(d*x+c)^4/a
```

maxima [B] time = 0.45, size = 169, normalized size = 1.92

$$-\frac{2i\left(315\sqrt{i\,a\tan\left(dx+c\right)+a} - \frac{42\left(3\left(i\,a\tan(dx+c)+a\right)^{\frac{5}{2}} - 10\left(i\,a\tan(dx+c)+a\right)^{\frac{3}{2}}a + 15\sqrt{i\,a\tan(dx+c)+a}\,a^{2}\right)}{a^{2}} + \frac{35\left(i\,a\tan(dx+c)+a\right)^{\frac{9}{2}} -}{}\right.}{315\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -2/315*I*(315*sqrt(I*a*tan(d*x + c) + a) - 42*(3*(I*a*tan(d*x + c) + a)^(5/
2) - 10*(I*a*tan(d*x + c) + a)^(3/2)*a + 15*sqrt(I*a*tan(d*x + c) + a)*a^2)
/a^2 + (35*(I*a*tan(d*x + c) + a)^(9/2) - 180*(I*a*tan(d*x + c) + a)^(7/2)*
a + 378*(I*a*tan(d*x + c) + a)^(5/2)*a^2 - 420*(I*a*tan(d*x + c) + a)^(3/2)
*a^3 + 315*sqrt(I*a*tan(d*x + c) + a)*a^4)/a^4)/(a*d)
```

mupad [B] time = 6.38, size = 306, normalized size = 3.48

$$-\frac{\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,256i}{315\,a\,d}-\frac{\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,128i}{315\,a\,d\,\left(e^{c\,2i+d\,x\,2i}+1\right)}-\frac{\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,32i}{105\,a\,d\,\left(e^{c\,2i+d\,x\,2i}+1\right)^2}+\frac{\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,32(}{63\,a\,d\,\left(e^{c\,2i+d\,x\,2i}+1\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^(1/2)),x)
```

```
[Out] ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*3
20i)/(63*a*d*(exp(c*2i + d*x*2i) + 1)^3) - ((a - (a*(exp(c*2i + d*x*2i)*1i
- 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*128i)/(315*a*d*(exp(c*2i + d*x*2i
) + 1)) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1
))^(1/2)*32i)/(105*a*d*(exp(c*2i + d*x*2i) + 1)^2) - ((a - (a*(exp(c*2i + d
*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*256i)/(315*a*d) - ((a -
 (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*32i)/(
9*a*d*(exp(c*2i + d*x*2i) + 1)^4)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^6(c+dx)}{\sqrt{ia(\tan(c+dx)-i)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(sec(c + d*x)**6/sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.335 $\int \frac{\sec^4(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=59

$$\frac{2i(a+ia\tan(c+dx))^{5/2}}{5a^3d}-\frac{4i(a+ia\tan(c+dx))^{3/2}}{3a^2d}$$

```
[Out] -4/3*I*(a+I*a*tan(d*x+c))^(3/2)/a^2/d+2/5*I*(a+I*a*tan(d*x+c))^(5/2)/a^3/d
```

Rubi [A] time = 0.06, antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 43}

$$\frac{2i(a+ia\tan(c+dx))^{5/2}}{5a^3d}-\frac{4i(a+ia\tan(c+dx))^{3/2}}{3a^2d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((-4*I)/3)*(a + I*a*Tan[c + d*x])^(3/2))/(a^2*d) + (((2*I)/5)*(a + I*a*Tan
[c + d*x])^(5/2))/(a^3*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^4(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)\sqrt{a+x}\,dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(2a\sqrt{a+x}-(a+x)^{3/2}\right)dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{4i(a+ia\tan(c+dx))^{3/2}}{3a^2d}+\frac{2i(a+ia\tan(c+dx))^{5/2}}{5a^3d}\end{aligned}$$

Mathematica [A] time = 0.23, size = 65, normalized size = 1.10

$$-\frac{2(3\tan(c+dx)+7i)\sec^2(c+dx)(\cos(2(c+dx))+i\sin(2(c+dx)))}{15d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (-2*Sec[c + d*x]^2*(Cos[2*(c + d*x)] + I*Sin[2*(c + d*x)])*(7*I + 3*Tan[c +
 d*x]))/(15*d*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.63, size = 76, normalized size = 1.29

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(-16i\,e^{(5i\,dx+5i\,c)}-40i\,e^{(3i\,dx+3i\,c)}\right)}{15\left(ade^{(4i\,dx+4i\,c)}+2\,ade^{(2i\,dx+2i\,c)}+ad\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/15*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-16*I*e^(5*I*d*x + 5*I*c) -
 40*I*e^(3*I*d*x + 3*I*c))/(a*d*e^(4*I*d*x + 4*I*c) + 2*a*d*e^(2*I*d*x + 2*
I*c) + a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec\left(dx+c\right)^{4}}{\sqrt{i\,a\tan\left(dx+c\right)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^4/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [A] time = 1.20, size = 73, normalized size = 1.24

$$-\frac{2\left(4i\left(\cos^{2}\left(dx+c\right)\right)-4\cos\left(dx+c\right)\sin\left(dx+c\right)+3i\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}}{15d\cos\left(dx+c\right)^{2}a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] -2/15/d*(4*I*cos(d*x+c)^2-4*cos(d*x+c)*sin(d*x+c)+3*I)*(a*(I*sin(d*x+c)+cos
(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^2/a
```

maxima [A] time = 0.32, size = 79, normalized size = 1.34

$$-\frac{2i\left(15\sqrt{i\,a\tan\left(dx+c\right)+a}-\frac{3\,(i\,a\tan(dx+c)+a)^{\frac{5}{2}}-10\,(i\,a\tan(dx+c)+a)^{\frac{3}{2}}a+15\,\sqrt{i\,a\tan(dx+c)+a}\,a^{2}}{a^{2}}\right)}{15\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -2/15*I*(15*sqrt(I*a*tan(d*x + c) + a) - (3*(I*a*tan(d*x + c) + a)^(5/2) -
10*(I*a*tan(d*x + c) + a)^(3/2)*a + 15*sqrt(I*a*tan(d*x + c) + a)*a^2)/a^2)
/(a*d)
```

mupad [B] time = 1.31, size = 155, normalized size = 2.63

$$-\frac{8\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}\,\left(\cos\left(2\,c+2\,d\,x\right)\,27\mathrm{i}+\cos\left(4\,c+4\,d\,x\right)\,9\mathrm{i}+\cos\left(6\,c+6\,d\,x\right)\,1\mathrm{i}-5\,\sin\left(2\,c+\right.\right.}{15\,a\,d\,\left(15\,\cos\left(2\,c+2\,d\,x\right)+6\,\cos\left(4\,c+4\,d\,x\right)+\cos\left(6\,c+6\,d\,x\right)\cdot\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^(1/2)),x)
```

```
[Out] -(8*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1
))^(1/2)*(cos(2*c + 2*d*x)*27i + cos(4*c + 4*d*x)*9i + cos(6*c + 6*d*x)*1i
- 5*sin(2*c + 2*d*x) - 4*sin(4*c + 4*d*x) - sin(6*c + 6*d*x) + 19i))/(15*a*
d*(15*cos(2*c + 2*d*x) + 6*cos(4*c + 4*d*x) + cos(6*c + 6*d*x) + 10))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^4(c+dx)}{\sqrt{ia(\tan(c+dx)-i)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(sec(c + d*x)**4/sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.336 $\int \frac{\sec^2(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=27

$$-\frac{2i\sqrt{a+ia\tan(c+dx)}}{ad}$$

```
[Out] -2*I*(a+I*a*tan(d*x+c))^(1/2)/a/d
```

Rubi [A] time = 0.06, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 32}

$$-\frac{2i\sqrt{a+ia\tan(c+dx)}}{ad}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((-2*I)*Sqrt[a + I*a*Tan[c + d*x]])/(a*d)
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m + 1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^2(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{1}{\sqrt{a+x}}\,dx, x, ia\tan(c+dx)\right)}{ad}\\ &= -\frac{2i\sqrt{a+ia\tan(c+dx)}}{ad}\end{aligned}$$

Mathematica [A] time = 0.18, size = 32, normalized size = 1.19

$$\frac{2(\tan(c+dx)-i)}{d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (2*(-I + Tan[c + d*x]))/(d*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.67, size = 37, normalized size = 1.37

$$-\frac{2i\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\,e^{(i\,dx+i\,c)}}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] -2*I*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(I*d*x + I*c)/(a*d)
```

giac [B] time = 2.00, size = 55, normalized size = 2.04

$$-\frac{2i\sqrt{\frac{a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-2ia\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-a}{\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1}}}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] -2*I*sqrt((a*tan(1/2*d*x + 1/2*c)^2 - 2*I*a*tan(1/2*d*x + 1/2*c) - a)/(tan(
1/2*d*x + 1/2*c)^2 - 1))/(a*d)
```

maple [A] time = 0.20, size = 24, normalized size = 0.89

$$-\frac{2i\sqrt{a+ia\tan\left(dx+c\right)}}{da}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] -2*I*(a+I*a*tan(d*x+c))^(1/2)/d/a
```

maxima [A] time = 0.54, size = 21, normalized size = 0.78

$$-\frac{2i\sqrt{ia\tan\left(dx+c\right)+a}}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -2*I*sqrt(I*a*tan(d*x + c) + a)/(a*d)
```

mupad [B] time = 0.16, size = 47, normalized size = 1.74

$$-\frac{\sqrt{\frac{a\left(2\cos(c+dx)^2+\sin(2c+2dx)\,1\mathrm{i}\right)}{2\cos(c+dx)^2}}\,2\mathrm{i}}{a\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^(1/2)),x)
```

```
[Out] -(((a*(sin(2*c + 2*d*x)*1i + 2*cos(c + d*x)^2))/(2*cos(c + d*x)^2))^(1/2)*2
i)/(a*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\sec^2\left(c+dx\right)}{\sqrt{ia\left(\tan\left(c+dx\right)-i\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(sec(c + d*x)**2/sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.337 $\int \frac{\cos^2(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=146

$$-\frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{3/2}}+\frac{5ia}{12d(a+ia\tan(c+dx))^{3/2}}+\frac{5i}{8d\sqrt{a+ia\tan(c+dx)}}-\frac{5i\tanh^{-1}\left(\frac{\sqrt{a}}{}\right.}{8\sqrt{2}}$$

```
[Out] -5/16*I*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))/d*2^(1/2)/a^(
1/2)+5/8*I/d/(a+I*a*tan(d*x+c))^(1/2)+5/12*I*a/d/(a+I*a*tan(d*x+c))^(3/2)-1
/2*I*a^2/d/(a-I*a*tan(d*x+c))/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.10, antiderivative size = 146, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {3487, 51, 63, 206}

$$-\frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{3/2}}+\frac{5ia}{12d(a+ia\tan(c+dx))^{3/2}}+\frac{5i}{8d\sqrt{a+ia\tan(c+dx)}}-\frac{5i\tanh^{-1}\left(\frac{\sqrt{a}}{}\right.}{8\sqrt{2}}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((-5*I)/8)*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a])])/(Sqrt[2]
*Sqrt[a]*d) + (((5*I)/12)*a)/(d*(a + I*a*Tan[c + d*x])^(3/2)) - ((I/2)*a^2)
/(d*(a - I*a*Tan[c + d*x])*(a + I*a*Tan[c + d*x])^(3/2)) + ((5*I)/8)/(d*Sqr
t[a + I*a*Tan[c + d*x]])
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^2(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx = -\frac{\left(ia^3\right)\text{Subst}\left(\int \frac{1}{(a-x)^2(a+x)^{5/2}}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{3/2}} - \frac{\left(5ia^2\right)\text{Subst}\left(\int \frac{1}{(a-x)(a+x)^{5/2}}\,dx, x$$

$$= \frac{5ia}{12d(a+ia\tan(c+dx))^{3/2}} - \frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{3/2}} - \frac{(5ia)$$

$$= \frac{5ia}{12d(a+ia\tan(c+dx))^{3/2}} - \frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{3/2}} + \frac{}{8d\sqrt{}}$$

$$= \frac{5ia}{12d(a+ia\tan(c+dx))^{3/2}} - \frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{3/2}} + \frac{}{8d\sqrt{}}$$

$$= -\frac{5i\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{8\sqrt{2}\sqrt{a}\,d} + \frac{5ia}{12d(a+ia\tan(c+dx))^{3/2}} - \frac{i}{2d(a-ia\tan(c+dx)}$$

Mathematica [A] time = 0.66, size = 126, normalized size = 0.86

$$-\frac{ie^{-2i(c+dx)}\left(\sqrt{1+e^{2i(c+dx)}}\left(-14e^{2i(c+dx)}+3e^{4i(c+dx)}-2\right)+15e^{3i(c+dx)}\sinh^{-1}\left(e^{i(c+dx)}\right)\right)}{24d\sqrt{1+e^{2i(c+dx)}}\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((-1/24*I)*(Sqrt[1 + E^((2*I)*(c + d*x))]*(-2 - 14*E^((2*I)*(c + d*x)) + 3*
E^((4*I)*(c + d*x))) + 15*E^((3*I)*(c + d*x))*ArcSinh[E^(I*(c + d*x))]))/(d
*E^((2*I)*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))]*Sqrt[a + I*a*Tan[c + d*x
]])
```

fricas [B] time = 1.31, size = 271, normalized size = 1.86

$$\frac{\left(-15i\sqrt{\frac{1}{2}}\,ad\sqrt{\frac{1}{ad^2}}\,e^{(3i\,dx+3i\,c)}\log\left(4\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(ade^{(2i\,dx+2i\,c)}+ad\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{ad^2}}+ae^{(i\,dx+i\,c)}\right)e^{(-i\,dx-i\,c)}\right)+15i}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/48*(-15*I*sqrt(1/2)*a*d*sqrt(1/(a*d^2))*e^(3*I*d*x + 3*I*c)*log(4*(sqrt(2
)*sqrt(1/2)*(a*d*e^(2*I*d*x + 2*I*c) + a*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1
))*sqrt(1/(a*d^2)) + a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) + 15*I*sqrt(1/2)*
a*d*sqrt(1/(a*d^2))*e^(3*I*d*x + 3*I*c)*log(-4*(sqrt(2)*sqrt(1/2)*(a*d*e^(2
*I*d*x + 2*I*c) + a*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a*d^2)) -
a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) + sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c)
+ 1))*(-3*I*e^(6*I*d*x + 6*I*c) + 11*I*e^(4*I*d*x + 4*I*c) + 16*I*e^(2*I*d*
x + 2*I*c) + 2*I))*e^(-3*I*d*x - 3*I*c)/(a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos(dx+c)^2}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(cos(d*x + c)^2/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [B] time = 1.15, size = 341, normalized size = 2.34

$$\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(32i\left(\cos^4(dx+c)\right)+15i\cos(dx+c)\arctan\left(\frac{(i\cos(dx+c)-i-\sin(dx+c))\sqrt{2}}{2\sin(dx+c)\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}}\right)\sqrt{2}\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 1/96/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(32*I*cos(d*x+c)^4+15
*I*cos(d*x+c)*arctan(1/2*(I*cos(d*x+c)-I-sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x
+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(
1/2)+32*cos(d*x+c)^3*sin(d*x+c)+15*I*arctan(1/2*(I*cos(d*x+c)-I-sin(d*x+c))
/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)*(-2*cos(d
*x+c)/(1+cos(d*x+c)))^(1/2)+15*arctan(1/2*(I*cos(d*x+c)-I-sin(d*x+c))/sin(d
*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*sin(d*x+c)*2^(1/2)*(-2*
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+20*I*cos(d*x+c)^2+60*cos(d*x+c)*sin(d*x+c)
)/a
```

maxima [A] time = 0.62, size = 138, normalized size = 0.95

$$\frac{i\left(15\sqrt{2}\sqrt{a}\log\left(-\frac{\sqrt{2}\sqrt{a}-\sqrt{ia\tan(dx+c)+a}}{\sqrt{2}\sqrt{a}+\sqrt{ia\tan(dx+c)+a}}\right)+\frac{4\left(15(ia\tan(dx+c)+a)^2a-20(ia\tan(dx+c)+a)a^2-8a^3\right)}{(ia\tan(dx+c)+a)^{\frac{5}{2}}-2(ia\tan(dx+c)+a)^{\frac{3}{2}}a}\right)}{96ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/96*I*(15*sqrt(2)*sqrt(a)*log(-(sqrt(2)*sqrt(a) - sqrt(I*a*tan(d*x + c) +
a))/(sqrt(2)*sqrt(a) + sqrt(I*a*tan(d*x + c) + a))) + 4*(15*(I*a*tan(d*x +
c) + a)^2*a - 20*(I*a*tan(d*x + c) + a)*a^2 - 8*a^3)/((I*a*tan(d*x + c) + a
)^(5/2) - 2*(I*a*tan(d*x + c) + a)^(3/2)*a))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\cos(c+d\,x)^2}{\sqrt{a+a\tan(c+d\,x)\,1\mathrm{i}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2/(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] int(cos(c + d*x)^2/(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos^2(c+dx)}{\sqrt{ia(\tan(c+dx)-i)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(cos(c + d*x)**2/sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.338 $\int \frac{\cos^4(c+dx)}{\sqrt{a+ia\tan(c+dx)}} dx$

Optimal. Leaf size=219

$$-\frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{5/2}}-\frac{9ia^3}{16d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{5/2}}+\frac{63ia}{160d(a+ia\tan}$$

```
[Out] -63/256*I*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))/d*2^(1/2)/a
^(1/2)+63/128*I/d/(a+I*a*tan(d*x+c))^(1/2)+63/160*I*a^2/d/(a+I*a*tan(d*x+c)
)^(5/2)-1/4*I*a^4/d/(a-I*a*tan(d*x+c))^2/(a+I*a*tan(d*x+c))^(5/2)-9/16*I*a^
3/d/(a-I*a*tan(d*x+c))/(a+I*a*tan(d*x+c))^(5/2)+21/64*I*a/d/(a+I*a*tan(d*x+
c))^(3/2)
```

Rubi [A] time = 0.12, antiderivative size = 219, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3487, 51, 63, 206}

$$-\frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{5/2}}-\frac{9ia^3}{16d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{5/2}}+\frac{63ia}{160d(a+ia\tan}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((-63*I)/128)*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a])])/(Sqrt
[2]*Sqrt[a]*d) + (((63*I)/160)*a^2)/(d*(a + I*a*Tan[c + d*x])^(5/2)) - ((I/
4)*a^4)/(d*(a - I*a*Tan[c + d*x])^2*(a + I*a*Tan[c + d*x])^(5/2)) - (((9*I)
/16)*a^3)/(d*(a - I*a*Tan[c + d*x])*(a + I*a*Tan[c + d*x])^(5/2)) + (((21*I
)/64)*a)/(d*(a + I*a*Tan[c + d*x])^(3/2)) + ((63*I)/128)/(d*Sqrt[a + I*a*Ta
n[c + d*x]])
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
```

```
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^4(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx = -\frac{\left(ia^5\right)\text{Subst}\left(\int \frac{1}{(a-x)^3(a+x)^{7/2}}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{5/2}} - \frac{\left(9ia^4\right)\text{Subst}\left(\int \frac{1}{(a-x)^2(a+x)^{7/2}}\,dx, x,\right.}{8d}$$

$$= -\frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{5/2}} - \frac{9ia^3}{16d(a-ia\tan(c+dx))(a+ia\tan(}$$

$$= \frac{63ia^2}{160d(a+ia\tan(c+dx))^{5/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{5/2}} - \frac{}{16d(a}$$

$$= \frac{63ia^2}{160d(a+ia\tan(c+dx))^{5/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{5/2}} - \frac{}{16d(a}$$

$$= \frac{63ia^2}{160d(a+ia\tan(c+dx))^{5/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{5/2}} - \frac{}{16d(a}$$

$$= \frac{63ia^2}{160d(a+ia\tan(c+dx))^{5/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{5/2}} - \frac{}{16d(a}$$

$$= -\frac{63i\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{128\sqrt{2}\sqrt{a}\,d} + \frac{63ia^2}{160d(a+ia\tan(c+dx))^{5/2}} - \frac{i}{4d(a-ia\tan(c+dx))}$$

Mathematica [A] time = 0.78, size = 152, normalized size = 0.69

$$-\frac{ie^{-4i(c+dx)}\left(\sqrt{1+e^{2i(c+dx)}}\left(-56e^{2i(c+dx)}-288e^{4i(c+dx)}+85e^{6i(c+dx)}+10e^{8i(c+dx)}-8\right)+315e^{5i(c+dx)}\sinh^{-1}\left(e^{i(c+dx)}\right)}{640d\sqrt{1+e^{2i(c+dx)}}\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((-1/640*I)*(Sqrt[1 + E^((2*I)*(c + d*x))]*(-8 - 56*E^((2*I)*(c + d*x)) - 2
88*E^((4*I)*(c + d*x)) + 85*E^((6*I)*(c + d*x)) + 10*E^((8*I)*(c + d*x))) +
 315*E^((5*I)*(c + d*x))*ArcSinh[E^(I*(c + d*x))]))/(d*E^((4*I)*(c + d*x))*
Sqrt[1 + E^((2*I)*(c + d*x))]*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.71, size = 293, normalized size = 1.34

$$\frac{\left(-315i\sqrt{\frac{1}{2}}\,ad\sqrt{\frac{1}{ad^2}}\,e^{(5i\,dx+5i\,c)}\log\left(4\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(ade^{(2i\,dx+2i\,c)}+ad\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{ad^2}}+ae^{(i\,dx+i\,c)}\right)e^{(-i\,dx-i\,c)}\right)+315i}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/1280*(-315*I*sqrt(1/2)*a*d*sqrt(1/(a*d^2))*e^(5*I*d*x + 5*I*c)*log(4*(sqr
t(2)*sqrt(1/2)*(a*d*e^(2*I*d*x + 2*I*c) + a*d)*sqrt(a/(e^(2*I*d*x + 2*I*c)
```

```
+ 1))*sqrt(1/(a*d^2)) + a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) + 315*I*sqrt(1
/2)*a*d*sqrt(1/(a*d^2))*e^(5*I*d*x + 5*I*c)*log(-4*(sqrt(2)*sqrt(1/2)*(a*d*
e^(2*I*d*x + 2*I*c) + a*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a*d^2)
) - a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) + sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I
*c) + 1))*(-10*I*e^(10*I*d*x + 10*I*c) - 95*I*e^(8*I*d*x + 8*I*c) + 203*I*e
^(6*I*d*x + 6*I*c) + 344*I*e^(4*I*d*x + 4*I*c) + 64*I*e^(2*I*d*x + 2*I*c) +
 8*I))*e^(-5*I*d*x - 5*I*c)/(a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos{(dx+c)}^4}{\sqrt{i\,a\tan{(dx+c)}+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(cos(d*x + c)^4/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [B] time = 1.15, size = 368, normalized size = 1.68

$$\frac{\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(512i\left(\cos^6(dx+c)\right)+512\left(\cos^5(dx+c)\right)\sin(dx+c)+315i\cos(dx+c)\arctan\left(\frac{(i\cos}{2\sin}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 1/2560/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(512*I*cos(d*x+c)^6
+512*cos(d*x+c)^5*sin(d*x+c)+315*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arc
tan(1/2*(I*cos(d*x+c)-I-sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)
))^(1/2)*2^(1/2))*2^(1/2)*cos(d*x+c)+96*I*cos(d*x+c)^4+315*I*(-2*cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I-sin(d*x+c))/sin(d*x+c)/(-
2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)+315*arctan(1/2*(I*cos(d
*x+c)-I-sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)
)*sin(d*x+c)*2^(1/2)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+672*cos(d*x+c)^3*
sin(d*x+c)+420*I*cos(d*x+c)^2+1260*cos(d*x+c)*sin(d*x+c))/a
```

maxima [A] time = 0.84, size = 192, normalized size = 0.88

$$\frac{i\left(315\sqrt{2}\sqrt{a}\log\left(-\frac{\sqrt{2}\sqrt{a}-\sqrt{i\,a\tan(dx+c)+a}}{\sqrt{2}\sqrt{a}+\sqrt{i\,a\tan(dx+c)+a}}\right)+\frac{4\left(315\,(i\,a\tan(dx+c)+a)^4a-1050\,(i\,a\tan(dx+c)+a)^3a^2+672\,(i\,a\tan(dx+c)+a)^2a^3+192\,(i}{(i\,a\tan(dx+c)+a)^{\frac{9}{2}}-4\,(i\,a\tan(dx+c)+a)^{\frac{7}{2}}a+4\,(i\,a\tan(dx+c)+a)^{\frac{5}{}}}\right.}{2560\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/2560*I*(315*sqrt(2)*sqrt(a)*log(-(sqrt(2)*sqrt(a) - sqrt(I*a*tan(d*x + c)
 + a))/(sqrt(2)*sqrt(a) + sqrt(I*a*tan(d*x + c) + a))) + 4*(315*(I*a*tan(d*
x + c) + a)^4*a - 1050*(I*a*tan(d*x + c) + a)^3*a^2 + 672*(I*a*tan(d*x + c)
 + a)^2*a^3 + 192*(I*a*tan(d*x + c) + a)*a^4 + 128*a^5)/((I*a*tan(d*x + c)
+ a)^(9/2) - 4*(I*a*tan(d*x + c) + a)^(7/2)*a + 4*(I*a*tan(d*x + c) + a)^(5
/2)*a^2))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\cos{(c+d\,x)}^4}{\sqrt{a+a\tan{(c+d\,x)}\,1{}\mathrm{i}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4/(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] int(cos(c + d*x)^4/(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos^4(c+dx)}{\sqrt{ia(\tan(c+dx)-i)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(cos(c + d*x)**4/sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.339 $\int \frac{\cos^6(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=292

$$-\frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{7/2}}-\frac{13ia^5}{48d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{7/2}}-\frac{}{192d(a-ia\,\mathrm{ta}}$$

```
[Out] -429/2048*I*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))/d*2^(1/2)
/a^(1/2)+429/1024*I/d/(a+I*a*tan(d*x+c))^(1/2)+429/896*I*a^3/d/(a+I*a*tan(d
*x+c))^(7/2)-1/6*I*a^6/d/(a-I*a*tan(d*x+c))^3/(a+I*a*tan(d*x+c))^(7/2)-13/4
8*I*a^5/d/(a-I*a*tan(d*x+c))^2/(a+I*a*tan(d*x+c))^(7/2)-143/192*I*a^4/d/(a-
I*a*tan(d*x+c))/(a+I*a*tan(d*x+c))^(7/2)+429/1280*I*a^2/d/(a+I*a*tan(d*x+c)
)^(5/2)+143/512*I*a/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.15, antiderivative size = 292, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {3487, 51, 63, 206}

$$-\frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{7/2}}-\frac{13ia^5}{48d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{7/2}}-\frac{}{192d(a-ia\,\mathrm{ta}}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^6/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((-429*I)/1024)*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a])])/(Sq
rt[2]*Sqrt[a]*d) + (((429*I)/896)*a^3)/(d*(a + I*a*Tan[c + d*x])^(7/2)) - (
(I/6)*a^6)/(d*(a - I*a*Tan[c + d*x])^3*(a + I*a*Tan[c + d*x])^(7/2)) - (((1
3*I)/48)*a^5)/(d*(a - I*a*Tan[c + d*x])^2*(a + I*a*Tan[c + d*x])^(7/2)) - (
((143*I)/192)*a^4)/(d*(a - I*a*Tan[c + d*x])*(a + I*a*Tan[c + d*x])^(7/2))
+ (((429*I)/1280)*a^2)/(d*(a + I*a*Tan[c + d*x])^(5/2)) + (((143*I)/512)*a)
/(d*(a + I*a*Tan[c + d*x])^(3/2)) + ((429*I)/1024)/(d*Sqrt[a + I*a*Tan[c +
d*x]])
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^6(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx = -\frac{\left(ia^7\right)\text{Subst}\left(\int \frac{1}{(a-x)^4(a+x)^{9/2}}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{7/2}} - \frac{\left(13ia^6\right)\text{Subst}\left(\int \frac{1}{(a-x)^3(a+x)^{9/2}}\,dx, x\right.}{12d}$$

$$= -\frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{7/2}} - \frac{13ia^5}{48d(a-ia\tan(c+dx))^2(a+ia\tan}$$

$$= -\frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{7/2}} - \frac{13ia^5}{48d(a-ia\tan(c+dx))^2(a+ia\tan}$$

$$= \frac{429ia^3}{896d(a+ia\tan(c+dx))^{7/2}} - \frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{7/2}} - \frac{}{48d(a}$$

$$= \frac{429ia^3}{896d(a+ia\tan(c+dx))^{7/2}} - \frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{7/2}} - \frac{}{48d(a}$$

$$= \frac{429ia^3}{896d(a+ia\tan(c+dx))^{7/2}} - \frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{7/2}} - \frac{}{48d(a}$$

$$= \frac{429ia^3}{896d(a+ia\tan(c+dx))^{7/2}} - \frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{7/2}} - \frac{}{48d(a}$$

$$= \frac{429ia^3}{896d(a+ia\tan(c+dx))^{7/2}} - \frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{7/2}} - \frac{}{48d(a}$$

$$= -\frac{429i\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{1024\sqrt{2}\sqrt{a}\,d} + \frac{429ia^3}{896d(a+ia\tan(c+dx))^{7/2}} - \frac{}{6d(a-ia\tan(c+dx}$$

Mathematica [A] time = 1.12, size = 178, normalized size = 0.61

$$-\frac{ie^{-6i(c+dx)}\left(\sqrt{1+e^{2i(c+dx)}}\left(-2064e^{2i(c+dx)} - 9008e^{4i(c+dx)} - 40784e^{6i(c+dx)} + 13755e^{8i(c+dx)} + 2590e^{10i(c+dx)} + 280e\right.\right.}{107520d\sqrt{1+e^{2i(c+dx)}}\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^6/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((-1/107520*I)*(Sqrt[1 + E^((2*I)*(c + d*x))]*(-240 - 2064*E^((2*I)*(c + d*
x)) - 9008*E^((4*I)*(c + d*x)) - 40784*E^((6*I)*(c + d*x)) + 13755*E^((8*I)
*(c + d*x)) + 2590*E^((10*I)*(c + d*x)) + 280*E^((12*I)*(c + d*x))) + 45045
*E^((7*I)*(c + d*x))*ArcSinh[E^(I*(c + d*x))]))/(d*E^((6*I)*(c + d*x))*Sqrt
[1 + E^((2*I)*(c + d*x))]*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.94, size = 315, normalized size = 1.08

$$\left(-45045i\sqrt{\frac{1}{2}}ad\sqrt{\frac{1}{ad^2}}e^{(7i\,dx+7i\,c)}\log\left(4\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(ade^{(2i\,dx+2i\,c)}+ad\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{ad^2}}+ae^{(i\,dx+i\,c)}\right)e^{(-i\,dx-i\,c)}\right)+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/215040*(-45045*I*sqrt(1/2)*a*d*sqrt(1/(a*d^2))*e^(7*I*d*x + 7*I*c)*log(4*
(sqrt(2)*sqrt(1/2)*(a*d*e^(2*I*d*x + 2*I*c) + a*d)*sqrt(a/(e^(2*I*d*x + 2*I
*c) + 1))*sqrt(1/(a*d^2)) + a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) + 45045*I*
sqrt(1/2)*a*d*sqrt(1/(a*d^2))*e^(7*I*d*x + 7*I*c)*log(-4*(sqrt(2)*sqrt(1/2)
*(a*d*e^(2*I*d*x + 2*I*c) + a*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(
a*d^2)) - a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) + sqrt(2)*sqrt(a/(e^(2*I*d*x
 + 2*I*c) + 1))*(-280*I*e^(14*I*d*x + 14*I*c) - 2870*I*e^(12*I*d*x + 12*I*c
) - 16345*I*e^(10*I*d*x + 10*I*c) + 27029*I*e^(8*I*d*x + 8*I*c) + 49792*I*e
^(6*I*d*x + 6*I*c) + 11072*I*e^(4*I*d*x + 4*I*c) + 2304*I*e^(2*I*d*x + 2*I*
c) + 240*I))*e^(-7*I*d*x - 7*I*c)/(a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos(dx+c)^6}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(cos(d*x + c)^6/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [A] time = 1.29, size = 395, normalized size = 1.35

$$\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(61440i\left(\cos^8(dx+c)\right)+61440\sin(dx+c)\left(\cos^7(dx+c)\right)+6656i\left(\cos^6(dx+c)\right)+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^6/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 1/430080/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(61440*I*cos(d*x+
c)^8+61440*sin(d*x+c)*cos(d*x+c)^7+6656*I*cos(d*x+c)^6+73216*cos(d*x+c)^5*s
in(d*x+c)+13728*I*cos(d*x+c)^4+45045*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*cos(d*x+c)*arctan(1/2*(I*cos(d*x+c)-I-sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c
)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)+45045*I*(-2*cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)*2^(1/2)*arctan(1/2*(I*cos(d*x+c)-I-sin(d*x+c))/sin(d*x+c)/(-2*co
s(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))+96096*cos(d*x+c)^3*sin(d*x+c)+45045
*arctan(1/2*(I*cos(d*x+c)-I-sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*
x+c)))^(1/2)*2^(1/2))*sin(d*x+c)*2^(1/2)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/
2)+60060*I*cos(d*x+c)^2+180180*cos(d*x+c)*sin(d*x+c))/a
```

maxima [A] time = 0.56, size = 246, normalized size = 0.84

$$\frac{i\left(45045\sqrt{2}\sqrt{a}\log\left(-\frac{\sqrt{2}\sqrt{a}-\sqrt{i\,a\tan(dx+c)+a}}{\sqrt{2}\sqrt{a}+\sqrt{i\,a\tan(dx+c)+a}}\right)+\frac{4\left(45045\,(i\,a\tan(dx+c)+a)^6a-240240\,(i\,a\tan(dx+c)+a)^5a^2+396396\,(i\,a\tan(dx+c)+\right.}{(i\,a\tan(dx+c)+a)^{\frac{13}{2}}-6\,(i\,a\tan(dx+c)+}\right.}{430080\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/430080*I*(45045*sqrt(2)*sqrt(a)*log(-(sqrt(2)*sqrt(a) - sqrt(I*a*tan(d*x
+ c) + a))/(sqrt(2)*sqrt(a) + sqrt(I*a*tan(d*x + c) + a))) + 4*(45045*(I*a*
tan(d*x + c) + a)^6*a - 240240*(I*a*tan(d*x + c) + a)^5*a^2 + 396396*(I*a*t
an(d*x + c) + a)^4*a^3 - 164736*(I*a*tan(d*x + c) + a)^3*a^4 - 36608*(I*a*t
an(d*x + c) + a)^2*a^5 - 19968*(I*a*tan(d*x + c) + a)*a^6 - 15360*a^7)/((I*
a*tan(d*x + c) + a)^(13/2) - 6*(I*a*tan(d*x + c) + a)^(11/2)*a + 12*(I*a*ta
n(d*x + c) + a)^(9/2)*a^2 - 8*(I*a*tan(d*x + c) + a)^(7/2)*a^3))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\cos\left(c+d\,x\right)^6}{\sqrt{a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^6/(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] int(cos(c + d*x)^6/(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos^{6}\left(c+dx\right)}{\sqrt{ia\left(\tan\left(c+dx\right)-i\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**6/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(cos(c + d*x)**6/sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.340 $\int \frac{\sec^9(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=147

$$\frac{256ia^4\sec^9(c+dx)}{6435d(a+ia\tan(c+dx))^{9/2}}+\frac{64ia^3\sec^9(c+dx)}{715d(a+ia\tan(c+dx))^{7/2}}+\frac{8ia^2\sec^9(c+dx)}{65d(a+ia\tan(c+dx))^{5/2}}+\frac{2ia\sec^9(c+dx)}{15d(a+ia\tan(c+dx))}$$

```
[Out] 256/6435*I*a^4*sec(d*x+c)^9/d/(a+I*a*tan(d*x+c))^(9/2)+64/715*I*a^3*sec(d*x
+c)^9/d/(a+I*a*tan(d*x+c))^(7/2)+8/65*I*a^2*sec(d*x+c)^9/d/(a+I*a*tan(d*x+c
))^(5/2)+2/15*I*a*sec(d*x+c)^9/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.26, antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3494, 3493}

$$\frac{8ia^2\sec^9(c+dx)}{65d(a+ia\tan(c+dx))^{5/2}}+\frac{64ia^3\sec^9(c+dx)}{715d(a+ia\tan(c+dx))^{7/2}}+\frac{256ia^4\sec^9(c+dx)}{6435d(a+ia\tan(c+dx))^{9/2}}+\frac{2ia\sec^9(c+dx)}{15d(a+ia\tan(c+dx))}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^9/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((256*I)/6435)*a^4*Sec[c + d*x]^9)/(d*(a + I*a*Tan[c + d*x])^(9/2)) + (((6
4*I)/715)*a^3*Sec[c + d*x]^9)/(d*(a + I*a*Tan[c + d*x])^(7/2)) + (((8*I)/65
)*a^2*Sec[c + d*x]^9)/(d*(a + I*a*Tan[c + d*x])^(5/2)) + (((2*I)/15)*a*Sec[
c + d*x]^9)/(d*(a + I*a*Tan[c + d*x])^(3/2))
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^9(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx &= \frac{2ia\sec^9(c+dx)}{15d(a+ia\tan(c+dx))^{3/2}}+\frac{1}{5}(4a)\int \frac{\sec^9(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx\\ &= \frac{8ia^2\sec^9(c+dx)}{65d(a+ia\tan(c+dx))^{5/2}}+\frac{2ia\sec^9(c+dx)}{15d(a+ia\tan(c+dx))^{3/2}}+\frac{1}{65}\left(32a^2\right)\int \frac{\sec^9}{(a+ia\,\mathrm{ta}}\\ &= \frac{64ia^3\sec^9(c+dx)}{715d(a+ia\tan(c+dx))^{7/2}}+\frac{8ia^2\sec^9(c+dx)}{65d(a+ia\tan(c+dx))^{5/2}}+\frac{2ia\sec^9(c+dx)}{15d(a+ia\tan(c+dx}\\ &= \frac{256ia^4\sec^9(c+dx)}{6435d(a+ia\tan(c+dx))^{9/2}}+\frac{64ia^3\sec^9(c+dx)}{715d(a+ia\tan(c+dx))^{7/2}}+\frac{8ia^2\sec^9(c+d}{65d(a+ia\tan(c+}\end{aligned}$$

Mathematica [A] time = 0.67, size = 95, normalized size = 0.65

$$\frac{2\sec^8(c+dx)(3i(90\sin(c+dx)+233\sin(3(c+dx)))+510\cos(c+dx)+731\cos(3(c+dx)))(\sin(4(c+dx))}{6435d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^9/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (2*Sec[c + d*x]^8*(510*Cos[c + d*x] + 731*Cos[3*(c + d*x)] + (3*I)*(90*Sin[
c + d*x] + 233*Sin[3*(c + d*x)]))*(I*Cos[4*(c + d*x)] + Sin[4*(c + d*x)]))/
(6435*d*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.79, size = 153, normalized size = 1.04

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(183040i\,e^{(6i\,dx+6i\,c)}+99840i\,e^{(4i\,dx+4i\,c)}+30720i\,e^{(2i\,dx+2i\,c)}+4096i\right)}{6435\left(ade^{(14i\,dx+14i\,c)}+7\,ade^{(12i\,dx+12i\,c)}+21\,ade^{(10i\,dx+10i\,c)}+35\,ade^{(8i\,dx+8i\,c)}+35\,ade^{(6i\,dx+6i\,c)}+21\,ade^{(4i\,dx+4i\,c)}+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/6435*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(183040*I*e^(6*I*d*x + 6*I
*c) + 99840*I*e^(4*I*d*x + 4*I*c) + 30720*I*e^(2*I*d*x + 2*I*c) + 4096*I)/(
a*d*e^(14*I*d*x + 14*I*c) + 7*a*d*e^(12*I*d*x + 12*I*c) + 21*a*d*e^(10*I*d*
x + 10*I*c) + 35*a*d*e^(8*I*d*x + 8*I*c) + 35*a*d*e^(6*I*d*x + 6*I*c) + 21*
a*d*e^(4*I*d*x + 4*I*c) + 7*a*d*e^(2*I*d*x + 2*I*c) + a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec\left(dx+c\right)^{9}}{\sqrt{i\,a\tan\left(dx+c\right)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^9/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [A] time = 2.96, size = 154, normalized size = 1.05

$$\frac{2\left(2048i\left(\cos^{8}\left(dx+c\right)\right)+2048\sin\left(dx+c\right)\left(\cos^{7}\left(dx+c\right)\right)-256i\left(\cos^{6}\left(dx+c\right)\right)+768\left(\cos^{5}\left(dx+c\right)\right)\sin\left(dx+\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 2/6435/d*(2048*I*cos(d*x+c)^8+2048*sin(d*x+c)*cos(d*x+c)^7-256*I*cos(d*x+c)
^6+768*cos(d*x+c)^5*sin(d*x+c)-80*I*cos(d*x+c)^4+560*cos(d*x+c)^3*sin(d*x+c
)-42*I*cos(d*x+c)^2+462*cos(d*x+c)*sin(d*x+c)-429*I)*(a*(I*sin(d*x+c)+cos(d
*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^7/a
```

maxima [B] time = 0.90, size = 608, normalized size = 4.14

$$-\frac{2\left(-1241i\sqrt{a}-\frac{5194\sqrt{a}\sin(dx+c)}{\cos(dx+c)+1}+\frac{6090i\sqrt{a}\sin(dx+c)^{2}}{(\cos(dx+c)+1)^{2}}+\frac{2490\sqrt{a}\sin(dx+c)^{3}}{(\cos(dx+c)+1)^{3}}-\frac{14430i\sqrt{a}\sin(dx+c)^{4}}{(\cos(dx+c)+1)^{4}}-\frac{33618\sqrt{a}\sin(dx+c)^{5}}{(\cos(dx+c)+1)^{5}}+\right.}{6435\left(a-\frac{8a\sin(dx+c)^{2}}{(\cos(dx+c)+1)^{2}}+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -2/6435*(-1241*I*sqrt(a) - 5194*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) + 6
090*I*sqrt(a)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 2490*sqrt(a)*sin(d*x +
```

```
c)^3/(cos(d*x + c) + 1)^3 - 14430*I*sqrt(a)*sin(d*x + c)^4/(cos(d*x + c) +
1)^4 - 33618*sqrt(a)*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 + 13442*I*sqrt(a)*
sin(d*x + c)^6/(cos(d*x + c) + 1)^6 - 18590*sqrt(a)*sin(d*x + c)^7/(cos(d*x
 + c) + 1)^7 - 18590*sqrt(a)*sin(d*x + c)^9/(cos(d*x + c) + 1)^9 - 13442*I*
sqrt(a)*sin(d*x + c)^10/(cos(d*x + c) + 1)^10 - 33618*sqrt(a)*sin(d*x + c)^
11/(cos(d*x + c) + 1)^11 + 14430*I*sqrt(a)*sin(d*x + c)^12/(cos(d*x + c) +
1)^12 + 2490*sqrt(a)*sin(d*x + c)^13/(cos(d*x + c) + 1)^13 - 6090*I*sqrt(a)
*sin(d*x + c)^14/(cos(d*x + c) + 1)^14 - 5194*sqrt(a)*sin(d*x + c)^15/(cos(
d*x + c) + 1)^15 + 1241*I*sqrt(a)*sin(d*x + c)^16/(cos(d*x + c) + 1)^16)*sq
rt(sin(d*x + c)/(cos(d*x + c) + 1) + 1)*sqrt(sin(d*x + c)/(cos(d*x + c) + 1
) - 1)/((a - 8*a*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 28*a*sin(d*x + c)^4/
(cos(d*x + c) + 1)^4 - 56*a*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 + 70*a*sin(
d*x + c)^8/(cos(d*x + c) + 1)^8 - 56*a*sin(d*x + c)^10/(cos(d*x + c) + 1)^1
0 + 28*a*sin(d*x + c)^12/(cos(d*x + c) + 1)^12 - 8*a*sin(d*x + c)^14/(cos(d
*x + c) + 1)^14 + a*sin(d*x + c)^16/(cos(d*x + c) + 1)^16)*d*sqrt(-2*I*sin(
d*x + c)/(cos(d*x + c) + 1) + sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 1))
```

mupad [B] time = 8.98, size = 301, normalized size = 2.05

$$\frac{e^{-c\,1i-d\,x\,1i}\,\sqrt{a-\frac{a\,\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)\,1i}{e^{c\,2i+d\,x\,2i}+1}}\,256i}{9\,a\,d\,\left(e^{c\,2i+d\,x\,2i}+1\right)^4}-\frac{e^{-c\,1i-d\,x\,1i}\,\sqrt{a-\frac{a\,\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)\,1i}{e^{c\,2i+d\,x\,2i}+1}}\,768i}{11\,a\,d\,\left(e^{c\,2i+d\,x\,2i}+1\right)^5}+\frac{e^{-c\,1i-d\,x\,1i}\,\sqrt{a-\frac{a\,\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)\,1}{e^{c\,2i+d\,x\,2i}+1}}}{13\,a\,d\,\left(e^{c\,2i+d\,x\,2i}+1\right)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^9*(a + a*tan(c + d*x)*1i)^(1/2)),x)
```

```
[Out] (exp(- c*1i - d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i +
d*x*2i) + 1))^(1/2)*256i)/(9*a*d*(exp(c*2i + d*x*2i) + 1)^4) - (exp(- c*1i
- d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1)
)^(1/2)*768i)/(11*a*d*(exp(c*2i + d*x*2i) + 1)^5) + (exp(- c*1i - d*x*1i)*(
a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*768
i)/(13*a*d*(exp(c*2i + d*x*2i) + 1)^6) - (exp(- c*1i - d*x*1i)*(a - (a*(exp
(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*256i)/(15*a*d*
(exp(c*2i + d*x*2i) + 1)^7)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^9(c+dx)}{\sqrt{ia\,(\tan(c+dx)-i)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**9/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(sec(c + d*x)**9/sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.341 $\int \frac{\sec^7(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=110

$$\frac{64ia^3\sec^7(c+dx)}{693d(a+ia\tan(c+dx))^{7/2}}+\frac{16ia^2\sec^7(c+dx)}{99d(a+ia\tan(c+dx))^{5/2}}+\frac{2ia\sec^7(c+dx)}{11d(a+ia\tan(c+dx))^{3/2}}$$

```
[Out] 64/693*I*a^3*sec(d*x+c)^7/d/(a+I*a*tan(d*x+c))^(7/2)+16/99*I*a^2*sec(d*x+c)
^7/d/(a+I*a*tan(d*x+c))^(5/2)+2/11*I*a*sec(d*x+c)^7/d/(a+I*a*tan(d*x+c))^(3
/2)
```

Rubi [A] time = 0.19, antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {3494, 3493}

$$\frac{16ia^2\sec^7(c+dx)}{99d(a+ia\tan(c+dx))^{5/2}}+\frac{64ia^3\sec^7(c+dx)}{693d(a+ia\tan(c+dx))^{7/2}}+\frac{2ia\sec^7(c+dx)}{11d(a+ia\tan(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^7/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((64*I)/693)*a^3*Sec[c + d*x]^7)/(d*(a + I*a*Tan[c + d*x])^(7/2)) + (((16*
I)/99)*a^2*Sec[c + d*x]^7)/(d*(a + I*a*Tan[c + d*x])^(5/2)) + (((2*I)/11)*a
*Sec[c + d*x]^7)/(d*(a + I*a*Tan[c + d*x])^(3/2))
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^7(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx &= \frac{2ia\sec^7(c+dx)}{11d(a+ia\tan(c+dx))^{3/2}}+\frac{1}{11}(8a)\int \frac{\sec^7(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx\\ &= \frac{16ia^2\sec^7(c+dx)}{99d(a+ia\tan(c+dx))^{5/2}}+\frac{2ia\sec^7(c+dx)}{11d(a+ia\tan(c+dx))^{3/2}}+\frac{1}{99}\left(32a^2\right)\int \frac{\sec^7(c+}{(a+ia\tan(c}\\ &= \frac{64ia^3\sec^7(c+dx)}{693d(a+ia\tan(c+dx))^{7/2}}+\frac{16ia^2\sec^7(c+dx)}{99d(a+ia\tan(c+dx))^{5/2}}+\frac{2ia\sec^7(c+dx)}{11d(a+ia\tan(c+dx))^{3/}}\end{aligned}$$

Mathematica [A] time = 0.44, size = 77, normalized size = 0.70

$$\frac{2\sec^6(c+dx)(91i\sin(2(c+dx))+107\cos(2(c+dx))+44)(\sin(3(c+dx))+i\cos(3(c+dx)))}{693d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^7/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (2*Sec[c + d*x]^6*(44 + 107*Cos[2*(c + d*x)] + (91*I)*Sin[2*(c + d*x)])*(I*
Cos[3*(c + d*x)] + Sin[3*(c + d*x)]))/(693*d*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.92, size = 116, normalized size = 1.05

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(6336i\,e^{(4i\,dx+4i\,c)}+2816i\,e^{(2i\,dx+2i\,c)}+512i\right)}{693\left(ade^{(10i\,dx+10i\,c)}+5\,ade^{(8i\,dx+8i\,c)}+10\,ade^{(6i\,dx+6i\,c)}+10\,ade^{(4i\,dx+4i\,c)}+5\,ade^{(2i\,dx+2i\,c)}+ad\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/693*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(6336*I*e^(4*I*d*x + 4*I*c)
 + 2816*I*e^(2*I*d*x + 2*I*c) + 512*I)/(a*d*e^(10*I*d*x + 10*I*c) + 5*a*d*e
^(8*I*d*x + 8*I*c) + 10*a*d*e^(6*I*d*x + 6*I*c) + 10*a*d*e^(4*I*d*x + 4*I*c
) + 5*a*d*e^(2*I*d*x + 2*I*c) + a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)^7}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^7/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [A] time = 1.44, size = 127, normalized size = 1.15

$$\frac{2\left(256i\left(\cos^6(dx+c)\right)+256\left(\cos^5(dx+c)\right)\sin(dx+c)-32i\left(\cos^4(dx+c)\right)+96\left(\cos^3(dx+c)\right)\sin(dx+c\right.}{693d\cos(dx+c)^5\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 2/693/d*(256*I*cos(d*x+c)^6+256*cos(d*x+c)^5*sin(d*x+c)-32*I*cos(d*x+c)^4+9
6*cos(d*x+c)^3*sin(d*x+c)-10*I*cos(d*x+c)^2+70*cos(d*x+c)*sin(d*x+c)-63*I)*
(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^5/a
```

maxima [B] time = 0.79, size = 474, normalized size = 4.31

$$-\frac{2\left(-151i\sqrt{a}-\frac{542\sqrt{a}\sin(dx+c)}{\cos(dx+c)+1}+\frac{484i\sqrt{a}\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-\frac{22\sqrt{a}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}-\frac{627i\sqrt{a}\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{1452\sqrt{a}\sin(dx+c)^5}{(\cos(dx+c)+1)^5}-\frac{1452\sqrt{a}}{(\cos(}\right.}{693\left(a-\frac{6a\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{15a\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{20a\sin(dx+c)^6}{(\cos(dx+c)+1)^6}+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -2/693*(-151*I*sqrt(a) - 542*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) + 484*
I*sqrt(a)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 22*sqrt(a)*sin(d*x + c)^3/(
cos(d*x + c) + 1)^3 - 627*I*sqrt(a)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 1
452*sqrt(a)*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 1452*sqrt(a)*sin(d*x + c)
```

```
^7/(cos(d*x + c) + 1)^7 + 627*I*sqrt(a)*sin(d*x + c)^8/(cos(d*x + c) + 1)^8
 - 22*sqrt(a)*sin(d*x + c)^9/(cos(d*x + c) + 1)^9 - 484*I*sqrt(a)*sin(d*x +
 c)^10/(cos(d*x + c) + 1)^10 - 542*sqrt(a)*sin(d*x + c)^11/(cos(d*x + c) +
1)^11 + 151*I*sqrt(a)*sin(d*x + c)^12/(cos(d*x + c) + 1)^12)*sqrt(sin(d*x +
 c)/(cos(d*x + c) + 1) + 1)*sqrt(sin(d*x + c)/(cos(d*x + c) + 1) - 1)/((a -
 6*a*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 15*a*sin(d*x + c)^4/(cos(d*x + c
) + 1)^4 - 20*a*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 + 15*a*sin(d*x + c)^8/(
cos(d*x + c) + 1)^8 - 6*a*sin(d*x + c)^10/(cos(d*x + c) + 1)^10 + a*sin(d*x
 + c)^12/(cos(d*x + c) + 1)^12)*d*sqrt(-2*I*sin(d*x + c)/(cos(d*x + c) + 1)
 + sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 1))
```

mupad [B] time = 6.16, size = 105, normalized size = 0.95

$$\frac{64\,\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\,\sqrt{a-\frac{a\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)\,1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,44\mathrm{i}+\mathrm{e}^{c\,4\mathrm{i}+d\,x\,4\mathrm{i}}\,99\mathrm{i}+8\mathrm{i}\right)}{693\,a\,d\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^7*(a + a*tan(c + d*x)*1i)^(1/2)),x)
```

```
[Out] (64*exp(- c*1i - d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i
 + d*x*2i) + 1))^(1/2)*(exp(c*2i + d*x*2i)*44i + exp(c*4i + d*x*4i)*99i + 8
i))/(693*a*d*(exp(c*2i + d*x*2i) + 1)^5)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^7(c+dx)}{\sqrt{ia\,(\tan(c+dx)-i)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**7/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(sec(c + d*x)**7/sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.342 $\int \frac{\sec^5(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=73

$$\frac{8ia^2\sec^5(c+dx)}{35d(a+ia\tan(c+dx))^{5/2}}+\frac{2ia\sec^5(c+dx)}{7d(a+ia\tan(c+dx))^{3/2}}$$

```
[Out] 8/35*I*a^2*sec(d*x+c)^5/d/(a+I*a*tan(d*x+c))^(5/2)+2/7*I*a*sec(d*x+c)^5/d/(
a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.12, antiderivative size = 73, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3494, 3493}

$$\frac{8ia^2\sec^5(c+dx)}{35d(a+ia\tan(c+dx))^{5/2}}+\frac{2ia\sec^5(c+dx)}{7d(a+ia\tan(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^5/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((8*I)/35)*a^2*Sec[c + d*x]^5)/(d*(a + I*a*Tan[c + d*x])^(5/2)) + (((2*I)/
7)*a*Sec[c + d*x]^5)/(d*(a + I*a*Tan[c + d*x])^(3/2))
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^5(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx &= \frac{2ia\sec^5(c+dx)}{7d(a+ia\tan(c+dx))^{3/2}}+\frac{1}{7}(4a)\int \frac{\sec^5(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx\\ &= \frac{8ia^2\sec^5(c+dx)}{35d(a+ia\tan(c+dx))^{5/2}}+\frac{2ia\sec^5(c+dx)}{7d(a+ia\tan(c+dx))^{3/2}}\end{aligned}$$

Mathematica [A] time = 0.28, size = 65, normalized size = 0.89

$$-\frac{2(5\tan(c+dx)-9i)\sec^3(c+dx)(\cos(2(c+dx))-i\sin(2(c+dx)))}{35d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^5/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (-2*Sec[c + d*x]^3*(Cos[2*(c + d*x)] - I*Sin[2*(c + d*x)])*(-9*I + 5*Tan[c
+ d*x]))/(35*d*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.79, size = 79, normalized size = 1.08

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(112i\,e^{(2i\,dx+2i\,c)}+32i\right)}{35\left(ade^{(6i\,dx+6i\,c)}+3\,ade^{(4i\,dx+4i\,c)}+3\,ade^{(2i\,dx+2i\,c)}+ad\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/35*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(112*I*e^(2*I*d*x + 2*I*c) +
 32*I)/(a*d*e^(6*I*d*x + 6*I*c) + 3*a*d*e^(4*I*d*x + 4*I*c) + 3*a*d*e^(2*I*
d*x + 2*I*c) + a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)^5}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^5/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [A] time = 1.25, size = 100, normalized size = 1.37

$$\frac{2\left(16i\left(\cos^4(dx+c)\right)+16\left(\cos^3(dx+c)\right)\sin(dx+c)-2i\left(\cos^2(dx+c)\right)+6\cos(dx+c)\sin(dx+c)-5i\right)\sqrt{\frac{a(i}{}}}{35d\cos(dx+c)^3\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 2/35/d*(16*I*cos(d*x+c)^4+16*cos(d*x+c)^3*sin(d*x+c)-2*I*cos(d*x+c)^2+6*cos
(d*x+c)*sin(d*x+c)-5*I)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos(
d*x+c)^3/a
```

maxima [B] time = 0.56, size = 340, normalized size = 4.66

$$-\frac{2\left(-9i\sqrt{a}-\frac{26\sqrt{a}\sin(dx+c)}{\cos(dx+c)+1}+\frac{14i\sqrt{a}\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-\frac{14\sqrt{a}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}-\frac{14\sqrt{a}\sin(dx+c)^5}{(\cos(dx+c)+1)^5}-\frac{14i\sqrt{a}\sin(dx+c)^6}{(\cos(dx+c)+1)^6}-\frac{26\sqrt{a}\sin(dx+c)^7}{(\cos(dx+c)+1)^7}+\right.}{35\left(a-\frac{4a\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{6a\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{4a\sin(dx+c)^6}{(\cos(dx+c)+1)^6}+\frac{a\sin(dx+c)^8}{(\cos(dx+c)+1)^8}\right)d\sqrt{-\frac{2i\sin(dx+c)}{\cos(dx+c)+1}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -2/35*(-9*I*sqrt(a) - 26*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) + 14*I*sqr
t(a)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 14*sqrt(a)*sin(d*x + c)^3/(cos(d
*x + c) + 1)^3 - 14*sqrt(a)*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 14*I*sqrt
(a)*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 - 26*sqrt(a)*sin(d*x + c)^7/(cos(d*
x + c) + 1)^7 + 9*I*sqrt(a)*sin(d*x + c)^8/(cos(d*x + c) + 1)^8)*sqrt(sin(d
*x + c)/(cos(d*x + c) + 1) + 1)*sqrt(sin(d*x + c)/(cos(d*x + c) + 1) - 1)/(
(a - 4*a*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 6*a*sin(d*x + c)^4/(cos(d*x
+ c) + 1)^4 - 4*a*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 + a*sin(d*x + c)^8/(c
```

```
os(d*x + c) + 1)^8)*d*sqrt(-2*I*sin(d*x + c)/(cos(d*x + c) + 1) + sin(d*x +
 c)^2/(cos(d*x + c) + 1)^2 - 1))
```

mupad [B] time = 9.26, size = 91, normalized size = 1.25

$$\frac{16\,{\mathrm{e}}^{-c\,1{}\mathrm{i}-d\,x\,1{}\mathrm{i}}\,\left({\mathrm{e}}^{c\,2{}\mathrm{i}+d\,x\,2{}\mathrm{i}}\,7{}\mathrm{i}+2{}\mathrm{i}\right)\,\sqrt{a-\frac{a\,\left({\mathrm{e}}^{c\,2{}\mathrm{i}+d\,x\,2{}\mathrm{i}}\,1{}\mathrm{i}-\mathrm{i}\right)\,1{}\mathrm{i}}{{\mathrm{e}}^{c\,2{}\mathrm{i}+d\,x\,2{}\mathrm{i}}+1}}}{35\,a\,d\,{\left({\mathrm{e}}^{c\,2{}\mathrm{i}+d\,x\,2{}\mathrm{i}}+1\right)}^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^(1/2)),x)
```

```
[Out] (16*exp(- c*1i - d*x*1i)*(exp(c*2i + d*x*2i)*7i + 2i)*(a - (a*(exp(c*2i + d
*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2))/(35*a*d*(exp(c*2i + d*
x*2i) + 1)^3)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^{5}{\left(c + dx \right)}}{\sqrt{ia \left(\tan{\left(c + dx \right)} - i\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**5/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(sec(c + d*x)**5/sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.343 $\int \frac{\sec^3(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=35

$$\frac{2ia\sec^3(c+dx)}{3d(a+ia\tan(c+dx))^{3/2}}$$

```
[Out] 2/3*I*a*sec(d*x+c)^3/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.05, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.038, Rules used = {3493}

$$\frac{2ia\sec^3(c+dx)}{3d(a+ia\tan(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((2*I)/3)*a*Sec[c + d*x]^3)/(d*(a + I*a*Tan[c + d*x])^(3/2))
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rubi steps

$$\int \frac{\sec^3(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx = \frac{2ia\sec^3(c+dx)}{3d(a+ia\tan(c+dx))^{3/2}}$$

Mathematica [A] time = 0.17, size = 40, normalized size = 1.14

$$\frac{2(\tan(c+dx)+i)\sec(c+dx)}{3d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^3/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (2*Sec[c + d*x]*(I + Tan[c + d*x]))/(3*d*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.71, size = 40, normalized size = 1.14

$$\frac{4i\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}}{3\left(ade^{(2i\,dx+2i\,c)}+ad\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 4/3*I*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))/(a*d*e^(2*I*d*x + 2*I*c) +
a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)^3}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^3/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [B] time = 1.18, size = 73, normalized size = 2.09

$$\frac{2\left(2i\left(\cos^2(dx+c)\right)+2\cos(dx+c)\sin(dx+c)-i\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}}{3d\cos(dx+c)\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 2/3/d*(2*I*cos(d*x+c)^2+2*cos(d*x+c)*sin(d*x+c)-I)*(a*(I*sin(d*x+c)+cos(d*x
+c))/cos(d*x+c))^(1/2)/cos(d*x+c)/a
```

maxima [B] time = 0.69, size = 206, normalized size = 5.89

$$-\frac{2\left(-i\sqrt{a}-\frac{2\sqrt{a}\sin(dx+c)}{\cos(dx+c)+1}-\frac{2\sqrt{a}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{i\sqrt{a}\sin(dx+c)^4}{(\cos(dx+c)+1)^4}\right)\sqrt{\frac{\sin(dx+c)}{\cos(dx+c)+1}+1}\sqrt{\frac{\sin(dx+c)}{\cos(dx+c)+1}-1}}{3\left(a-\frac{2a\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{a\sin(dx+c)^4}{(\cos(dx+c)+1)^4}\right)d\sqrt{-\frac{2i\sin(dx+c)}{\cos(dx+c)+1}+\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] -2/3*(-I*sqrt(a) - 2*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) - 2*sqrt(a)*si
n(d*x + c)^3/(cos(d*x + c) + 1)^3 + I*sqrt(a)*sin(d*x + c)^4/(cos(d*x + c)
+ 1)^4)*sqrt(sin(d*x + c)/(cos(d*x + c) + 1) + 1)*sqrt(sin(d*x + c)/(cos(d*
x + c) + 1) - 1)/((a - 2*a*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + a*sin(d*x
+ c)^4/(cos(d*x + c) + 1)^4)*d*sqrt(-2*I*sin(d*x + c)/(cos(d*x + c) + 1) +
sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 1))
```

mupad [B] time = 1.02, size = 98, normalized size = 2.80

$$\frac{2\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}\,\left(\sin(c+d\,x)+\sin(3\,c+3\,d\,x)+\cos(c+d\,x)\,1\mathrm{i}+\cos(3\,c+3\,d\,x)\,1\mathrm{i}\right)}{3\,a\,d\,\left(\cos(2\,c+2\,d\,x)+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^(1/2)),x)
```

```
[Out] (2*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1)
)^(1/2)*(cos(c + d*x)*1i + sin(c + d*x) + cos(3*c + 3*d*x)*1i + sin(3*c + 3
*d*x)))/(3*a*d*(cos(2*c + 2*d*x) + 1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^3(c+dx)}{\sqrt{ia(\tan(c+dx)-i)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(sec(c + d*x)**3/sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.344 $\int \frac{\sec(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=52

$$\frac{i\sqrt{2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{\sqrt{a}\,d}$$

```
[Out] I*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2))*2^(1/2)/
d/a^(1/2)
```

Rubi [A] time = 0.04, antiderivative size = 52, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3489, 206}

$$\frac{i\sqrt{2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{\sqrt{a}\,d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (I*Sqrt[2]*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[c + d*x
]])])/(Sqrt[a]*d)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx &= \frac{(2i)\,\text{Subst}\left(\int \frac{1}{2-ax^2}\,dx, x, \frac{\sec(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\right)}{d}\\ &= \frac{i\sqrt{2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{\sqrt{a}\,d}\end{aligned}$$

Mathematica [A] time = 0.38, size = 70, normalized size = 1.35

$$\frac{2ie^{i(c+dx)}\tanh^{-1}\left(\sqrt{1+e^{2i(c+dx)}}\right)}{d\sqrt{1+e^{2i(c+dx)}}\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((2*I)*E^(I*(c + d*x))*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]])/(d*Sqrt[1 +
E^((2*I)*(c + d*x))]*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [B] time = 0.68, size = 149, normalized size = 2.87

$$\frac{1}{2} i \sqrt{2} \sqrt{\frac{1}{ad^2}} \log\left(\frac{\left(2\left(2i\,de^{(2i\,dx+2i\,c)}+2i\,d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{ad^2}}+4i\right)e^{(-i\,dx-i\,c)}}{d}\right)-\frac{1}{2} i \sqrt{2} \sqrt{\frac{1}{ad^2}} \log\left(\frac{\left(2\left(-2i\,de^{(2i}\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/2*I*sqrt(2)*sqrt(1/(a*d^2))*log((2*(2*I*d*e^(2*I*d*x + 2*I*c) + 2*I*d)*sq
rt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a*d^2)) + 4*I)*e^(-I*d*x - I*c)/d)
- 1/2*I*sqrt(2)*sqrt(1/(a*d^2))*log((2*(-2*I*d*e^(2*I*d*x + 2*I*c) - 2*I*d)
*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a*d^2)) + 4*I)*e^(-I*d*x - I*c)/
d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [B] time = 0.98, size = 137, normalized size = 2.63

$$-\frac{\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\arctan\left(\frac{(i\cos(dx+c)-i+\sin(dx+c))\sqrt{2}}{2\sin(dx+c)\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}}\right)\sin(dx+c)\sqrt{2}}{d\,(i\sin(dx+c)+\cos(dx+c)-1)\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] -1/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(-2*cos(d*x+c)/(1+cos(d
*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x
+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*sin(d*x+c)/(I*sin(d*x+c)+cos(d*x+c)-1)*2
^(1/2)/a
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sec(d*x + c)/sqrt(I*a*tan(d*x + c) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{\cos(c+d\,x)\,\sqrt{a+a\tan(c+d\,x)\,1\mathrm{i}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^(1/2)),x)
```

```
[Out] int(1/(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec{(c+dx)}}{\sqrt{ia(\tan{(c+dx)}-i)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(sec(c + d*x)/sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.345 $\int \frac{\cos(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=122

$$-\frac{3i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{4ad}+\frac{i\cos(c+dx)}{2d\sqrt{a+ia\tan(c+dx)}}+\frac{3i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{4\sqrt{2}\sqrt{a}d}$$

```
[Out] 3/8*I*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2))/d*2^
(1/2)/a^(1/2)+1/2*I*cos(d*x+c)/d/(a+I*a*tan(d*x+c))^(1/2)-3/4*I*cos(d*x+c)*
(a+I*a*tan(d*x+c))^(1/2)/a/d
```

Rubi [A] time = 0.13, antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {3502, 3490, 3489, 206}

$$-\frac{3i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{4ad}+\frac{i\cos(c+dx)}{2d\sqrt{a+ia\tan(c+dx)}}+\frac{3i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{4\sqrt{2}\sqrt{a}d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((3*I)/4)*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[c + d*x
]])])/(Sqrt[2]*Sqrt[a]*d) + ((I/2)*Cos[c + d*x])/(d*Sqrt[a + I*a*Tan[c + d*
x]]) - (((3*I)/4)*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])/(a*d)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3490

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] + Dist[a/(2*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b*Tan[e +
f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] &&
EqQ[m/2 + n, 0] && GtQ[n, 0]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{\cos(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx = \frac{i\cos(c+dx)}{2d\sqrt{a+ia\tan(c+dx)}} + \frac{3\int \cos(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx}{4a}$$
$$= \frac{i\cos(c+dx)}{2d\sqrt{a+ia\tan(c+dx)}} - \frac{3i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{4ad} + \frac{3}{8}\int \frac{\sec(c+dx)}{\sqrt{a+ia\tan(c+}}$$
$$= \frac{i\cos(c+dx)}{2d\sqrt{a+ia\tan(c+dx)}} - \frac{3i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{4ad} + \frac{(3i)\,\text{Subst}\left(\int \frac{1}{2-ax^2}\,d\right.}{4}$$
$$= \frac{3i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{4\sqrt{2}\sqrt{a}\,d} + \frac{i\cos(c+dx)}{2d\sqrt{a+ia\tan(c+dx)}} - \frac{3i\cos(c+dx)\sqrt{a+ia\tan}}{4ad}$$

Mathematica [A] time = 0.55, size = 96, normalized size = 0.79

$$\frac{\sec(c+dx)\left(3i\sqrt{1+e^{2i(c+dx)}}\tanh^{-1}\left(\sqrt{1+e^{2i(c+dx)}}\right) - i(3i\sin(2(c+dx)) + \cos(2(c+dx)) + 1)\right)}{8d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (Sec[c + d*x]*((3*I)*Sqrt[1 + E^((2*I)*(c + d*x))]*ArcTanh[Sqrt[1 + E^((2*I
)*(c + d*x))]] - I*(1 + Cos[2*(c + d*x)] + (3*I)*Sin[2*(c + d*x)])))/(8*d*S
qrt[a + I*a*Tan[c + d*x]])
```

fricas [B] time = 0.68, size = 245, normalized size = 2.01

$$\left(3i\sqrt{\frac{1}{2}}ad\sqrt{\frac{1}{ad^2}}e^{(2i\,dx+2i\,c)}\log\left(\frac{\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(6i\,de^{(2i\,dx+2i\,c)}+6i\,d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{ad^2}}+6i\right)e^{(-i\,dx-i\,c)}}{4\,d}\right) - 3i\sqrt{\frac{1}{2}}ad\sqrt{\frac{1}{ad^2}}e^{(2i\,dx+2i\,c)}\log\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/8*(3*I*sqrt(1/2)*a*d*sqrt(1/(a*d^2))*e^(2*I*d*x + 2*I*c)*log(1/4*(sqrt(2)
*sqrt(1/2)*(6*I*d*e^(2*I*d*x + 2*I*c) + 6*I*d)*sqrt(a/(e^(2*I*d*x + 2*I*c)
+ 1))*sqrt(1/(a*d^2)) + 6*I)*e^(-I*d*x - I*c)/d) - 3*I*sqrt(1/2)*a*d*sqrt(1
/(a*d^2))*e^(2*I*d*x + 2*I*c)*log(1/4*(sqrt(2)*sqrt(1/2)*(-6*I*d*e^(2*I*d*x
 + 2*I*c) - 6*I*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a*d^2)) + 6*I)
*e^(-I*d*x - I*c)/d) + sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-2*I*e^(4
*I*d*x + 4*I*c) - I*e^(2*I*d*x + 2*I*c) + I))*e^(-2*I*d*x - 2*I*c)/(a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos(dx+c)}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(cos(d*x + c)/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [B] time = 1.15, size = 319, normalized size = 2.61

$$\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(3i\cos\left(dx+c\right)\sqrt{2}\,\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\,\arctan\left(\frac{(i\cos(dx+c)-i+\sin(dx+c))\sqrt{2}}{2\sin(dx+c)\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}}\right)+8i\left(\cos^{3}\left(dx+c\right)\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 1/16/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(3*I*cos(d*x+c)*2^(1/
2)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+
c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))+8*I*cos(d*x+c)
^3+3*I*2^(1/2)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c
)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))+3*
2^(1/2)*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d
*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)
)+8*cos(d*x+c)^2*sin(d*x+c)-12*I*cos(d*x+c))/a
```

maxima [B] time = 1.27, size = 837, normalized size = 6.86

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/32*((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1
/4)*((4*I*sqrt(2)*cos(2*d*x + 2*c) + 4*sqrt(2)*sin(2*d*x + 2*c) - 8*I*sqrt(
2))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 4*(sqrt(2)*c
os(2*d*x + 2*c) - I*sqrt(2)*sin(2*d*x + 2*c) - 2*sqrt(2))*sin(1/2*arctan2(s
in(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)))*sqrt(a) - (6*sqrt(2)*arctan2((cos(
2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + si
n(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c) + 1)) + 1) - 6*sqrt(2)*arctan2((cos(2*d*x + 2*c)^2
 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)
^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*
d*x + 2*c) + 1)) - 1) - 3*I*sqrt(2)*log(sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x
 + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c) + 1))^2 + sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(
2*d*x + 2*c) + 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^
2 + 2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1
/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1) + 3*I*sqr
t(2)*log(sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c)
+ 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + sqrt(cos(
2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*sin(1/2*arcta
n2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 - 2*(cos(2*d*x + 2*c)^2 + sin
(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c) + 1)) + 1))*sqrt(a))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\cos\left(c+d\,x\right)}{\sqrt{a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)/(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] int(cos(c + d*x)/(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos(c+dx)}{\sqrt{ia(\tan(c+dx)-i)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(cos(c + d*x)/sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.346 $\int \frac{\cos^3(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=193

$$-\frac{7i\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{24ad}+\frac{i\cos^3(c+dx)}{4d\sqrt{a+ia\tan(c+dx)}}-\frac{35i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{64ad}+\frac{35i\,c}{96d\sqrt{a+}}$$

```
[Out] 35/128*I*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2))/d
*2^(1/2)/a^(1/2)+35/96*I*cos(d*x+c)/d/(a+I*a*tan(d*x+c))^(1/2)+1/4*I*cos(d*
x+c)^3/d/(a+I*a*tan(d*x+c))^(1/2)-35/64*I*cos(d*x+c)*(a+I*a*tan(d*x+c))^(1/
2)/a/d-7/24*I*cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(1/2)/a/d
```

Rubi [A] time = 0.27, antiderivative size = 193, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {3502, 3497, 3490, 3489, 206}

$$-\frac{7i\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{24ad}+\frac{i\cos^3(c+dx)}{4d\sqrt{a+ia\tan(c+dx)}}-\frac{35i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{64ad}+\frac{35i\,c}{96d\sqrt{a+}}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((35*I)/64)*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[c + d
*x]])])/(Sqrt[2]*Sqrt[a]*d) + (((35*I)/96)*Cos[c + d*x])/(d*Sqrt[a + I*a*Ta
n[c + d*x]]) + ((I/4)*Cos[c + d*x]^3)/(d*Sqrt[a + I*a*Tan[c + d*x]]) - (((3
5*I)/64)*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])/(a*d) - (((7*I)/24)*Cos[c
 + d*x]^3*Sqrt[a + I*a*Tan[c + d*x]])/(a*d)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3490

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] + Dist[a/(2*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b*Tan[e +
f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] &&
EqQ[m/2 + n, 0] && GtQ[n, 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{\cos^3(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx = \frac{i\cos^3(c+dx)}{4d\sqrt{a+ia\tan(c+dx)}} + \frac{7\int \cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}\,dx}{8a}$$

$$= \frac{i\cos^3(c+dx)}{4d\sqrt{a+ia\tan(c+dx)}} - \frac{7i\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{24ad} + \frac{35}{48}\int \frac{\cos(c+ }{\sqrt{a+ia\tan(}$$

$$= \frac{35i\cos(c+dx)}{96d\sqrt{a+ia\tan(c+dx)}} + \frac{i\cos^3(c+dx)}{4d\sqrt{a+ia\tan(c+dx)}} - \frac{7i\cos^3(c+dx)\sqrt{a+ia\tan(c+}}{24ad}$$

$$= \frac{35i\cos(c+dx)}{96d\sqrt{a+ia\tan(c+dx)}} + \frac{i\cos^3(c+dx)}{4d\sqrt{a+ia\tan(c+dx)}} - \frac{35i\cos(c+dx)\sqrt{a+ia\tan(c+}}{64ad}$$

$$= \frac{35i\cos(c+dx)}{96d\sqrt{a+ia\tan(c+dx)}} + \frac{i\cos^3(c+dx)}{4d\sqrt{a+ia\tan(c+dx)}} - \frac{35i\cos(c+dx)\sqrt{a+ia\tan(c+}}{64ad}$$

$$= \frac{35i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{64\sqrt{2}\sqrt{a}\,d} + \frac{35i\cos(c+dx)}{96d\sqrt{a+ia\tan(c+dx)}} + \frac{i\cos^3(c+dx)}{4d\sqrt{a+ia\tan(c+dx)}}$$

Mathematica [A] time = 0.67, size = 117, normalized size = 0.61

$$\frac{\sec(c+dx)\left(133\sin(2(c+dx)) + 14\sin(4(c+dx)) - 43i\cos(2(c+dx)) - 2i\cos(4(c+dx)) + 105i\sqrt{1+e^{2i(c+dx)}}\ \mathrm{t}\right.}{384d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (Sec[c + d*x]*(-41*I + (105*I)*Sqrt[1 + E^((2*I)*(c + d*x))]*ArcTanh[Sqrt[1
 + E^((2*I)*(c + d*x))]] - (43*I)*Cos[2*(c + d*x)] - (2*I)*Cos[4*(c + d*x)]
 + 133*Sin[2*(c + d*x)] + 14*Sin[4*(c + d*x)]))/(384*d*Sqrt[a + I*a*Tan[c +
 d*x]])
```

fricas [A] time = 0.71, size = 267, normalized size = 1.38

$$\frac{\left(105i\sqrt{\frac{1}{2}}\,ad\sqrt{\frac{1}{ad^2}}\,e^{(4i\,dx+4i\,c)}\log\left(\frac{\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(1120i\,de^{(2i\,dx+2i\,c)}+1120i\,d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{ad^2}}+1120i\right)e^{(-i\,dx-i\,c)}}{1024\,d}\right) - 105i\sqrt{\frac{1}{2}}\,ad\sqrt{\frac{1}{ad^2}}\,e}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] 1/384*(105*I*sqrt(1/2)*a*d*sqrt(1/(a*d^2))*e^(4*I*d*x + 4*I*c)*log(1/1024*(
sqrt(2)*sqrt(1/2)*(1120*I*d*e^(2*I*d*x + 2*I*c) + 1120*I*d)*sqrt(a/(e^(2*I*
d*x + 2*I*c) + 1))*sqrt(1/(a*d^2)) + 1120*I)*e^(-I*d*x - I*c)/d) - 105*I*sq
rt(1/2)*a*d*sqrt(1/(a*d^2))*e^(4*I*d*x + 4*I*c)*log(1/1024*(sqrt(2)*sqrt(1/
```

```
2)*(-1120*I*d*e^(2*I*d*x + 2*I*c) - 1120*I*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) +
 1))*sqrt(1/(a*d^2)) + 1120*I)*e^(-I*d*x - I*c)/d) + sqrt(2)*sqrt(a/(e^(2*I
*d*x + 2*I*c) + 1))*(-8*I*e^(8*I*d*x + 8*I*c) - 88*I*e^(6*I*d*x + 6*I*c) -
41*I*e^(4*I*d*x + 4*I*c) + 45*I*e^(2*I*d*x + 2*I*c) + 6*I))*e^(-4*I*d*x - 4
*I*c)/(a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos(dx+c)^3}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(cos(d*x + c)^3/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [B] time = 1.12, size = 346, normalized size = 1.79

$$\frac{\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(192i\left(\cos^5(dx+c)\right)+105i\cos(dx+c)\sqrt{2}\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\arctan\left(\frac{(i\cos(dx+c)-i+\sin(dx+c)}{2\sin(dx+c)\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 1/768/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(192*I*cos(d*x+c)^5+
105*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d
*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*cos(d*x+c)*
2^(1/2)+192*sin(d*x+c)*cos(d*x+c)^4+105*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos
(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)+105*2^(1/2)*sin(d*x+c)*(-2*cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos
(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))+56*I*cos(d*x+c)^3+280*cos(d*x+c)^2*s
in(d*x+c)-420*I*cos(d*x+c))/a
```

maxima [B] time = 1.45, size = 1939, normalized size = 10.05

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] 1/1536*((cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*a
rctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x
 + 4*c), cos(4*d*x + 4*c))) + 1)^(3/4)*((12*I*sqrt(2)*cos(4*d*x + 4*c) + 12
*sqrt(2)*sin(4*d*x + 4*c) - 32*I*sqrt(2))*cos(3/2*arctan2(sin(1/2*arctan2(s
in(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(
4*d*x + 4*c))) + 1)) - 4*(3*sqrt(2)*cos(4*d*x + 4*c) - 3*I*sqrt(2)*sin(4*d*
x + 4*c) - 8*sqrt(2))*sin(3/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos
(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1))
)*sqrt(a) + (cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1
/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4
*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*((12*I*sqrt(2)*cos(4*d*x + 4*c)
+ 144*I*sqrt(2)*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 12*s
qrt(2)*sin(4*d*x + 4*c) + 144*sqrt(2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos
(4*d*x + 4*c))) - 288*I*sqrt(2))*cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x
+ 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4
*c))) + 1)) - (12*sqrt(2)*cos(4*d*x + 4*c) + 144*sqrt(2)*cos(1/2*arctan2(si
```

```
n(4*d*x + 4*c), cos(4*d*x + 4*c))) - 12*I*sqrt(2)*sin(4*d*x + 4*c) - 144*I*
sqrt(2)*sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) - 288*sqrt(2))
*sin(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(
1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)))*sqrt(a) - (210*sqrt
(2)*arctan2((cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1
/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4
*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*sin(1/2*arctan2(sin(1/2*arctan2(
sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos
(4*d*x + 4*c))) + 1)), (cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))
)^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*ar
ctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(1
/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x
+ 4*c), cos(4*d*x + 4*c))) + 1)) + 1) - 210*sqrt(2)*arctan2((cos(1/2*arctan
2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c)
, cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*
c))) + 1)^(1/4)*sin(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x
 + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)), (cos
(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4
*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos
(4*d*x + 4*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c)
, cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))
+ 1)) - 1) - 105*I*sqrt(2)*log(sqrt(cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4
*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 +
2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)*cos(1/2*arctan2
(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(
4*d*x + 4*c), cos(4*d*x + 4*c))) + 1))^2 + sqrt(cos(1/2*arctan2(sin(4*d*x +
 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x +
 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)*sin
(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*
arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1))^2 + 2*(cos(1/2*arctan2(s
in(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), c
os(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))
) + 1)^(1/4)*cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x +
4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)) + 1) + 1
05*I*sqrt(2)*log(sqrt(cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^
2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arct
an2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)*cos(1/2*arctan2(sin(1/2*arcta
n2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c),
cos(4*d*x + 4*c))) + 1))^2 + sqrt(cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d
*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*
cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)*sin(1/2*arctan2(s
in(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*
d*x + 4*c), cos(4*d*x + 4*c))) + 1))^2 - 2*(cos(1/2*arctan2(sin(4*d*x + 4*c
), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c
)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*c
os(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/
2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)) + 1))*sqrt(a))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\cos(c+dx)^3}{\sqrt{a+a\tan(c+dx)\,1\mathrm{i}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3/(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] int(cos(c + d*x)^3/(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

3.347 $\int \frac{\sec^8(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=117

$$\frac{2i(a+ia\tan(c+dx))^{11/2}}{11a^7d}-\frac{4i(a+ia\tan(c+dx))^{9/2}}{3a^6d}+\frac{24i(a+ia\tan(c+dx))^{7/2}}{7a^5d}-\frac{16i(a+ia\tan(c+dx))^{5/2}}{5a^4d}$$

```
[Out] -16/5*I*(a+I*a*tan(d*x+c))^(5/2)/a^4/d+24/7*I*(a+I*a*tan(d*x+c))^(7/2)/a^5/
d-4/3*I*(a+I*a*tan(d*x+c))^(9/2)/a^6/d+2/11*I*(a+I*a*tan(d*x+c))^(11/2)/a^7
/d
```

Rubi [A] time = 0.09, antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 43}

$$\frac{2i(a+ia\tan(c+dx))^{11/2}}{11a^7d}-\frac{4i(a+ia\tan(c+dx))^{9/2}}{3a^6d}+\frac{24i(a+ia\tan(c+dx))^{7/2}}{7a^5d}-\frac{16i(a+ia\tan(c+dx))^{5/2}}{5a^4d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^8/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((-16*I)/5)*(a + I*a*Tan[c + d*x])^(5/2))/(a^4*d) + (((24*I)/7)*(a + I*a*T
an[c + d*x])^(7/2))/(a^5*d) - (((4*I)/3)*(a + I*a*Tan[c + d*x])^(9/2))/(a^6
*d) + (((2*I)/11)*(a + I*a*Tan[c + d*x])^(11/2))/(a^7*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^8(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^3(a+x)^{3/2}\,dx,x,ia\tan(c+dx)\right)}{a^7d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(8a^3(a+x)^{3/2}-12a^2(a+x)^{5/2}+6a(a+x)^{7/2}-(a+x)^{9/2}\right)dx,x,ia\tan\right.}{a^7d}\\ &= -\frac{16i(a+ia\tan(c+dx))^{5/2}}{5a^4d}+\frac{24i(a+ia\tan(c+dx))^{7/2}}{7a^5d}-\frac{4i(a+ia\tan(c+dx))^{9/2}}{3a^6d}\end{aligned}$$

Mathematica [A] time = 0.81, size = 110, normalized size = 0.94

$$\frac{2i\sec^6(c+dx)(\cos(4(c+dx))+i\sin(4(c+dx)))(494i\cos(2(c+dx))+110\tan(c+dx)+215\sin(3(c+dx))\sec(}{1155ad(\tan(c+dx)-i)\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^8/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((2*I)/1155)*Sec[c + d*x]^6*(Cos[4*(c + d*x)] + I*Sin[4*(c + d*x)])*(39*I
+ (494*I)*Cos[2*(c + d*x)] + 215*Sec[c + d*x]*Sin[3*(c + d*x)] + 110*Tan[c
+ d*x]))/(a*d*(-I + Tan[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.80, size = 149, normalized size = 1.27

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(-1024i\,e^{(11i\,dx+11i\,c)}-5632i\,e^{(9i\,dx+9i\,c)}-12672i\,e^{(7i\,dx+7i\,c)}-14784i\,e^{(5i\,dx+5i\,c)}\right)}{1155\left(a^2de^{(10i\,dx+10i\,c)}+5\,a^2de^{(8i\,dx+8i\,c)}+10\,a^2de^{(6i\,dx+6i\,c)}+10\,a^2de^{(4i\,dx+4i\,c)}+5\,a^2de^{(2i\,dx+2i\,c)}+a^2d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/1155*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-1024*I*e^(11*I*d*x + 11*
I*c) - 5632*I*e^(9*I*d*x + 9*I*c) - 12672*I*e^(7*I*d*x + 7*I*c) - 14784*I*e
^(5*I*d*x + 5*I*c))/(a^2*d*e^(10*I*d*x + 10*I*c) + 5*a^2*d*e^(8*I*d*x + 8*I
*c) + 10*a^2*d*e^(6*I*d*x + 6*I*c) + 10*a^2*d*e^(4*I*d*x + 4*I*c) + 5*a^2*d
*e^(2*I*d*x + 2*I*c) + a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec\left(dx+c\right)^{8}}{\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^8/(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [A] time = 1.37, size = 117, normalized size = 1.00

$$-\frac{2\left(256i\left(\cos^{5}\left(dx+c\right)\right)-256\sin\left(dx+c\right)\left(\cos^{4}\left(dx+c\right)\right)+32i\left(\cos^{3}\left(dx+c\right)\right)-160\left(\cos^{2}\left(dx+c\right)\right)\sin\left(dx+\right.\right.}{1155d\cos\left(dx+c\right)^{5}a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] -2/1155/d*(256*I*cos(d*x+c)^5-256*sin(d*x+c)*cos(d*x+c)^4+32*I*cos(d*x+c)^3
-160*cos(d*x+c)^2*sin(d*x+c)+245*I*cos(d*x+c)+105*sin(d*x+c))*(a*(I*sin(d*x
+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^5/a^2
```

maxima [A] time = 0.37, size = 76, normalized size = 0.65

$$\frac{2i\left(105\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{11}{2}}-770\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{9}{2}}a+1980\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{7}{2}}a^2-1848\left(i\,a\tan\left(dx\right.\right.}{1155\,a^7d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 2/1155*I*(105*(I*a*tan(d*x + c) + a)^(11/2) - 770*(I*a*tan(d*x + c) + a)^(9
/2)*a + 1980*(I*a*tan(d*x + c) + a)^(7/2)*a^2 - 1848*(I*a*tan(d*x + c) + a)
^(5/2)*a^3)/(a^7*d)
```

mupad [B] time = 7.64, size = 370, normalized size = 3.16

$$-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)\,1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,1024\mathrm{i}}{1155\,a^2\,d}-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)\,1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,512\mathrm{i}}{1155\,a^2\,d\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)\,1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,128\mathrm{i}}{385\,a^2\,d\,{\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}^2}-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)\,1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,6}{231\,a^2\,d\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^8*(a + a*tan(c + d*x)*1i)^(3/2)),x)
```

```
[Out] ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*2
56i)/(33*a^2*d*(exp(c*2i + d*x*2i) + 1)^4) - ((a - (a*(exp(c*2i + d*x*2i)*1
i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*512i)/(1155*a^2*d*(exp(c*2i + d
*x*2i) + 1)) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i
) + 1))^(1/2)*128i)/(385*a^2*d*(exp(c*2i + d*x*2i) + 1)^2) - ((a - (a*(exp(
c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*64i)/(231*a^2*d
*(exp(c*2i + d*x*2i) + 1)^3) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(e
xp(c*2i + d*x*2i) + 1))^(1/2)*1024i)/(1155*a^2*d) - ((a - (a*(exp(c*2i + d*
x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*64i)/(11*a^2*d*(exp(c*2i
 + d*x*2i) + 1)^5)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^{8}{\left(c+dx\right)}}{\left(ia\left(\tan{\left(c+dx\right)}-i\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral(sec(c + d*x)**8/(I*a*(tan(c + d*x) - I))**(3/2), x)
```

3.348 $\int \frac{\sec^6(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=88

$$-\frac{2i(a+ia\tan(c+dx))^{7/2}}{7a^5d}+\frac{8i(a+ia\tan(c+dx))^{5/2}}{5a^4d}-\frac{8i(a+ia\tan(c+dx))^{3/2}}{3a^3d}$$

```
[Out] -8/3*I*(a+I*a*tan(d*x+c))^(3/2)/a^3/d+8/5*I*(a+I*a*tan(d*x+c))^(5/2)/a^4/d-
2/7*I*(a+I*a*tan(d*x+c))^(7/2)/a^5/d
```

Rubi [A] time = 0.08, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 43}

$$-\frac{2i(a+ia\tan(c+dx))^{7/2}}{7a^5d}+\frac{8i(a+ia\tan(c+dx))^{5/2}}{5a^4d}-\frac{8i(a+ia\tan(c+dx))^{3/2}}{3a^3d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((-8*I)/3)*(a + I*a*Tan[c + d*x])^(3/2))/(a^3*d) + (((8*I)/5)*(a + I*a*Tan
[c + d*x])^(5/2))/(a^4*d) - (((2*I)/7)*(a + I*a*Tan[c + d*x])^(7/2))/(a^5*d
)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^6(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^2\sqrt{a+x}\,dx,x,ia\tan(c+dx)\right)}{a^5d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(4a^2\sqrt{a+x}-4a(a+x)^{3/2}+(a+x)^{5/2}\right)dx,x,ia\tan(c+dx)\right)}{a^5d}\\ &= -\frac{8i(a+ia\tan(c+dx))^{3/2}}{3a^3d}+\frac{8i(a+ia\tan(c+dx))^{5/2}}{5a^4d}-\frac{2i(a+ia\tan(c+dx))^{7/2}}{7a^5d}\end{aligned}$$

Mathematica [A] time = 0.39, size = 92, normalized size = 1.05

$$-\frac{2\sec^5(c+dx)(-27i\sin(2(c+dx))+43\cos(2(c+dx))+28)(\cos(3(c+dx))+i\sin(3(c+dx)))}{105ad(\tan(c+dx)-i)\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (-2*Sec[c + d*x]^5*(28 + 43*Cos[2*(c + d*x)] - (27*I)*Sin[2*(c + d*x)])*(Co
s[3*(c + d*x)] + I*Sin[3*(c + d*x)]))/(105*a*d*(-I + Tan[c + d*x])*Sqrt[a +
 I*a*Tan[c + d*x]])
```

fricas [A] time = 0.57, size = 108, normalized size = 1.23

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(-128i\,e^{(7i\,dx+7i\,c)}-448i\,e^{(5i\,dx+5i\,c)}-560i\,e^{(3i\,dx+3i\,c)}\right)}{105\left(a^2de^{(6i\,dx+6i\,c)}+3\,a^2de^{(4i\,dx+4i\,c)}+3\,a^2de^{(2i\,dx+2i\,c)}+a^2d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/105*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-128*I*e^(7*I*d*x + 7*I*c)
 - 448*I*e^(5*I*d*x + 5*I*c) - 560*I*e^(3*I*d*x + 3*I*c))/(a^2*d*e^(6*I*d*x
 + 6*I*c) + 3*a^2*d*e^(4*I*d*x + 4*I*c) + 3*a^2*d*e^(2*I*d*x + 2*I*c) + a^2
*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec\left(dx+c\right)^6}{\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^6/(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [A] time = 1.15, size = 90, normalized size = 1.02

$$-\frac{2\left(32i\left(\cos^3\left(dx+c\right)\right)-32\left(\cos^2\left(dx+c\right)\right)\sin\left(dx+c\right)+39i\cos\left(dx+c\right)+15\sin\left(dx+c\right)\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}}{105d\cos\left(dx+c\right)^3a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] -2/105/d*(32*I*cos(d*x+c)^3-32*cos(d*x+c)^2*sin(d*x+c)+39*I*cos(d*x+c)+15*s
in(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^3/a^2
```

maxima [A] time = 0.41, size = 58, normalized size = 0.66

$$-\frac{2i\left(15\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{7}{2}}-84\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{5}{2}}a+140\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{3}{2}}a^2\right)}{105\,a^5d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] -2/105*I*(15*(I*a*tan(d*x + c) + a)^(7/2) - 84*(I*a*tan(d*x + c) + a)^(5/2)
*a + 140*(I*a*tan(d*x + c) + a)^(3/2)*a^2)/(a^5*d)
```

mupad [B] time = 6.68, size = 242, normalized size = 2.75

$$-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,128\mathrm{i}}{105\,a^2\,d}-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,64\mathrm{i}}{105\,a^2\,d\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,16\mathrm{i}}{35\,a^2\,d\,{\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}^2}+\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,16\mathrm{i}}{7\,a^2\,d\,{\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^(3/2)),x)
```

```
[Out] ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*1
6i)/(7*a^2*d*(exp(c*2i + d*x*2i) + 1)^3) - ((a - (a*(exp(c*2i + d*x*2i)*1i
- 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*64i)/(105*a^2*d*(exp(c*2i + d*x*2
i) + 1)) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) +
1))^(1/2)*16i)/(35*a^2*d*(exp(c*2i + d*x*2i) + 1)^2) - ((a - (a*(exp(c*2i +
 d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*128i)/(105*a^2*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^6(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral(sec(c + d*x)**6/(I*a*(tan(c + d*x) - I))**(3/2), x)
```

3.349 $\int \frac{\sec^4(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=57

$$\frac{2i(a+ia\tan(c+dx))^{3/2}}{3a^3d}-\frac{4i\sqrt{a+ia\tan(c+dx)}}{a^2d}$$

```
[Out] -4*I*(a+I*a*tan(d*x+c))^(1/2)/a^2/d+2/3*I*(a+I*a*tan(d*x+c))^(3/2)/a^3/d
```

Rubi [A] time = 0.07, antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 43}

$$\frac{2i(a+ia\tan(c+dx))^{3/2}}{3a^3d}-\frac{4i\sqrt{a+ia\tan(c+dx)}}{a^2d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] ((-4*I)*Sqrt[a + I*a*Tan[c + d*x]])/(a^2*d) + (((2*I)/3)*(a + I*a*Tan[c + d
*x])^(3/2))/(a^3*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^4(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{a-x}{\sqrt{a+x}}\,dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(\frac{2a}{\sqrt{a+x}}-\sqrt{a+x}\right)dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{4i\sqrt{a+ia\tan(c+dx)}}{a^2d}+\frac{2i(a+ia\tan(c+dx))^{3/2}}{3a^3d}\end{aligned}$$

Mathematica [A] time = 0.26, size = 80, normalized size = 1.40

$$\frac{2i(\tan(c+dx)+5i)\sec^2(c+dx)(\cos(2(c+dx))+i\sin(2(c+dx)))}{3ad(\tan(c+dx)-i)\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((2*I)/3)*Sec[c + d*x]^2*(Cos[2*(c + d*x)] + I*Sin[2*(c + d*x)])*(5*I + Ta
n[c + d*x]))/(a*d*(-I + Tan[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 1.66, size = 67, normalized size = 1.18

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(-8i\,e^{(3i\,dx+3i\,c)}-12i\,e^{(i\,dx+i\,c)}\right)}{3\left(a^2de^{(2i\,dx+2i\,c)}+a^2d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/3*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-8*I*e^(3*I*d*x + 3*I*c) - 1
2*I*e^(I*d*x + I*c))/(a^2*d*e^(2*I*d*x + 2*I*c) + a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec\left(dx+c\right)^4}{\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^4/(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [A] time = 1.11, size = 61, normalized size = 1.07

$$-\frac{2\left(5i\cos\left(dx+c\right)+\sin\left(dx+c\right)\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}}{3d\cos\left(dx+c\right)a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] -2/3/d*(5*I*cos(d*x+c)+sin(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))
^(1/2)/cos(d*x+c)/a^2
```

maxima [A] time = 0.41, size = 38, normalized size = 0.67

$$\frac{2i\left(\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{3}{2}}-6\sqrt{i\,a\tan\left(dx+c\right)+a}\,a\right)}{3\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 2/3*I*((I*a*tan(d*x + c) + a)^(3/2) - 6*sqrt(I*a*tan(d*x + c) + a)*a)/(a^3*
d)
```

mupad [B] time = 3.66, size = 85, normalized size = 1.49

$$-\frac{2\,\left(\cos\left(2\,c+2\,d\,x\right)\,5\mathrm{i}+\sin\left(2\,c+2\,d\,x\right)+5\mathrm{i}\right)\,\sqrt{\frac{a\,\left(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i}\right)}{\cos(2\,c+2\,d\,x)+1}}}{3\,a^2\,d\,\left(\cos\left(2\,c+2\,d\,x\right)+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^(3/2)),x)
```

```
[Out] -(2*(cos(2*c + 2*d*x)*5i + sin(2*c + 2*d*x) + 5i)*((a*(cos(2*c + 2*d*x) + s
in(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1))^(1/2))/(3*a^2*d*(cos(2*c +
 2*d*x) + 1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^4(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral(sec(c + d*x)**4/(I*a*(tan(c + d*x) - I))**(3/2), x)
```

3.350 $\int \frac{\sec^2(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=27

$$\frac{2i}{ad\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] 2*I/a/d/(a+I*a*tan(d*x+c))^(1/2)
```

Rubi [A] time = 0.06, antiderivative size = 27, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {3487, 32}

$$\frac{2i}{ad\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (2*I)/(a*d*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m + 1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^2(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{1}{(a+x)^{3/2}}\,dx, x, ia\tan(c+dx)\right)}{ad}\\ &= \frac{2i}{ad\sqrt{a+ia\tan(c+dx)}}\end{aligned}$$

Mathematica [A] time = 0.16, size = 27, normalized size = 1.00

$$\frac{2i}{ad\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (2*I)/(a*d*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [B] time = 0.71, size = 49, normalized size = 1.81

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(i\,e^{(2i\,dx+2i\,c)}+i\right)e^{(-i\,dx-i\,c)}}{a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(I*e^(2*I*d*x + 2*I*c) + I)*e^(-I
*d*x - I*c)/(a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)^2}{(i\,a\tan(dx+c)+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^2/(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [A] time = 0.19, size = 24, normalized size = 0.89

$$\frac{2i}{ad\sqrt{a+ia\tan(dx+c)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] 2*I/a/d/(a+I*a*tan(d*x+c))^(1/2)
```

maxima [A] time = 0.45, size = 21, normalized size = 0.78

$$\frac{2i}{\sqrt{i\,a\tan(dx+c)+a}\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 2*I/(sqrt(I*a*tan(d*x + c) + a)*a*d)
```

mupad [B] time = 0.24, size = 67, normalized size = 2.48

$$\frac{\left(\cos(c+d\,x)^2\,2\mathrm{i}+\sin(2\,c+2\,d\,x)\right)\sqrt{\frac{a\left(2\cos(c+d\,x)^2+\sin(2\,c+2\,d\,x)\,1\mathrm{i}\right)}{2\cos(c+d\,x)^2}}}{a^2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^(3/2)),x)
```

```
[Out] ((sin(2*c + 2*d*x) + cos(c + d*x)^2*2i)*((a*(sin(2*c + 2*d*x)*1i + 2*cos(c
+ d*x)^2))/(2*cos(c + d*x)^2))^(1/2))/(a^2*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^2(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral(sec(c + d*x)**2/(I*a*(tan(c + d*x) - I))**(3/2), x)
```

3.351 $\int \frac{\cos^2(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=175

$$-\frac{7i\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{16\sqrt{2}a^{3/2}d}-\frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{5/2}}+\frac{7ia}{20d(a+ia\tan(c+dx))^{5/2}}+\frac{}{24d(a}$$

```
[Out] -7/32*I*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))/a^(3/2)/d*2^(
1/2)+7/16*I/a/d/(a+I*a*tan(d*x+c))^(1/2)+7/20*I*a/d/(a+I*a*tan(d*x+c))^(5/2
)-1/2*I*a^2/d/(a-I*a*tan(d*x+c))/(a+I*a*tan(d*x+c))^(5/2)+7/24*I/d/(a+I*a*t
an(d*x+c))^(3/2)
```

Rubi [A] time = 0.12, antiderivative size = 175, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3487, 51, 63, 206}

$$-\frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{5/2}}-\frac{7i\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{16\sqrt{2}a^{3/2}d}+\frac{7ia}{20d(a+ia\tan(c+dx))^{5/2}}+\frac{}{24d(a}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((-7*I)/16)*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a])])/(Sqrt[2
]*a^(3/2)*d) + (((7*I)/20)*a)/(d*(a + I*a*Tan[c + d*x])^(5/2)) - ((I/2)*a^2
)/(d*(a - I*a*Tan[c + d*x])*(a + I*a*Tan[c + d*x])^(5/2)) + ((7*I)/24)/(d*(
a + I*a*Tan[c + d*x])^(3/2)) + ((7*I)/16)/(a*d*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^2(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx = -\frac{\left(ia^3\right)\text{Subst}\left(\int \frac{1}{(a-x)^2(a+x)^{7/2}}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{5/2}} - \frac{\left(7ia^2\right)\text{Subst}\left(\int \frac{1}{(a-x)(a+x)^{7/2}}\,dx, x,\right.}{4d}$$

$$= \frac{7ia}{20d(a+ia\tan(c+dx))^{5/2}} - \frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{5/2}} - \frac{(7ia)\,\text{S}}{}$$

$$= \frac{7ia}{20d(a+ia\tan(c+dx))^{5/2}} - \frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{5/2}} + \frac{}{24d(a}$$

$$= \frac{7ia}{20d(a+ia\tan(c+dx))^{5/2}} - \frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{5/2}} + \frac{}{24d(a}$$

$$= \frac{7ia}{20d(a+ia\tan(c+dx))^{5/2}} - \frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{5/2}} + \frac{}{24d(a}$$

$$= -\frac{7i\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{16\sqrt{2}\,a^{3/2}d} + \frac{7ia}{20d(a+ia\tan(c+dx))^{5/2}} - \frac{ia}{2d(a-ia\tan(c+dx))(}$$

Mathematica [A] time = 1.00, size = 142, normalized size = 0.81

$$-\frac{ie^{-5i(c+dx)}\sec(c+dx)\left(-38e^{2i(c+dx)} - 148e^{4i(c+dx)} - 101e^{6i(c+dx)} + 15e^{8i(c+dx)} + 105e^{5i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\,\sinh^{-1}\left(e\right.\right.}{480ad\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] ((-1/480*I)*(-6 - 38*E^((2*I)*(c + d*x)) - 148*E^((4*I)*(c + d*x)) - 101*E^
((6*I)*(c + d*x)) + 15*E^((8*I)*(c + d*x)) + 105*E^((5*I)*(c + d*x))*Sqrt[1
 + E^((2*I)*(c + d*x))]*ArcSinh[E^(I*(c + d*x))])*Sec[c + d*x])/(a*d*E^((5*
I)*(c + d*x))*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [B] time = 0.47, size = 294, normalized size = 1.68

$$\frac{\left(-105i\sqrt{\frac{1}{2}}\,a^2d\sqrt{\frac{1}{a^3d^2}}\,e^{(5i\,dx+5i\,c)}\log\left(4\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(a^2de^{(2i\,dx+2i\,c)}+a^2d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{a^3d^2}}+ae^{(i\,dx+i\,c)}\right)e^{(-i\,dx-i\,c)}\right)+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/480*(-105*I*sqrt(1/2)*a^2*d*sqrt(1/(a^3*d^2))*e^(5*I*d*x + 5*I*c)*log(4*(
sqrt(2)*sqrt(1/2)*(a^2*d*e^(2*I*d*x + 2*I*c) + a^2*d)*sqrt(a/(e^(2*I*d*x +
2*I*c) + 1))*sqrt(1/(a^3*d^2)) + a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) + 105
*I*sqrt(1/2)*a^2*d*sqrt(1/(a^3*d^2))*e^(5*I*d*x + 5*I*c)*log(-4*(sqrt(2)*sq
rt(1/2)*(a^2*d*e^(2*I*d*x + 2*I*c) + a^2*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1
))*sqrt(1/(a^3*d^2)) - a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) + sqrt(2)*sqrt(
a/(e^(2*I*d*x + 2*I*c) + 1))*(-15*I*e^(8*I*d*x + 8*I*c) + 101*I*e^(6*I*d*x
+ 6*I*c) + 148*I*e^(4*I*d*x + 4*I*c) + 38*I*e^(2*I*d*x + 2*I*c) + 6*I))*e^(
-5*I*d*x - 5*I*c)/(a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos(dx+c)^2}{(i\,a\tan(dx+c)+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(cos(d*x + c)^2/(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [B] time = 1.07, size = 368, normalized size = 2.10

$$\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(384i\left(\cos^6(dx+c)\right)+384\left(\cos^5(dx+c)\right)\sin(dx+c)+32i\left(\cos^4(dx+c)\right)+105i\cos\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] 1/960/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(384*I*cos(d*x+c)^6+
384*cos(d*x+c)^5*sin(d*x+c)+32*I*cos(d*x+c)^4+105*I*cos(d*x+c)*(-2*cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I-sin(d*x+c))/sin(d*x+c)/
(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)+105*I*(-2*cos(d*x+c)/
(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I-sin(d*x+c))/sin(d*x+c)/(-2
*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)+224*cos(d*x+c)^3*sin(d*x
+c)+105*arctan(1/2*(I*cos(d*x+c)-I-sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1
+cos(d*x+c)))^(1/2)*2^(1/2))*sin(d*x+c)*2^(1/2)*(-2*cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)+140*I*cos(d*x+c)^2+420*cos(d*x+c)*sin(d*x+c))/a^2
```

maxima [A] time = 0.50, size = 153, normalized size = 0.87

$$\frac{i\left(\frac{105\sqrt{2}\log\left(-\frac{\sqrt{2}\sqrt{a}-\sqrt{i\,a\tan(dx+c)+a}}{\sqrt{2}\sqrt{a}+\sqrt{i\,a\tan(dx+c)+a}}\right)}{\sqrt{a}}+\frac{4\left(105\,(i\,a\tan(dx+c)+a)^3-140\,(i\,a\tan(dx+c)+a)^2a-56\,(i\,a\tan(dx+c)+a)a^2-48\,a^3\right)}{(i\,a\tan(dx+c)+a)^{\frac{7}{2}}-2\,(i\,a\tan(dx+c)+a)^{\frac{5}{2}}a}\right)}{960\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 1/960*I*(105*sqrt(2)*log(-(sqrt(2)*sqrt(a) - sqrt(I*a*tan(d*x + c) + a))/(s
qrt(2)*sqrt(a) + sqrt(I*a*tan(d*x + c) + a)))/sqrt(a) + 4*(105*(I*a*tan(d*x
 + c) + a)^3 - 140*(I*a*tan(d*x + c) + a)^2*a - 56*(I*a*tan(d*x + c) + a)*a
^2 - 48*a^3)/((I*a*tan(d*x + c) + a)^(7/2) - 2*(I*a*tan(d*x + c) + a)^(5/2)
*a))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\cos(c+d\,x)^2}{(a+a\tan(c+d\,x)\,1\mathrm{i})^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2/(a + a*tan(c + d*x)*1i)^(3/2),x)
```

```
[Out] int(cos(c + d*x)^2/(a + a*tan(c + d*x)*1i)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos^2(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral(cos(c + d*x)**2/(I*a*(tan(c + d*x) - I))**(3/2), x)
```

3.352 $\int \frac{\cos^4(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=248

$$-\frac{99i\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{256\sqrt{2}a^{3/2}d}-\frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{7/2}}-\frac{11ia^3}{16d(a-ia\tan(c+dx))(a+ia\tan$$

```
[Out] -99/512*I*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))/a^(3/2)/d*2
^(1/2)+99/256*I/a/d/(a+I*a*tan(d*x+c))^(1/2)+99/224*I*a^2/d/(a+I*a*tan(d*x+
c))^(7/2)-1/4*I*a^4/d/(a-I*a*tan(d*x+c))^2/(a+I*a*tan(d*x+c))^(7/2)-11/16*I
*a^3/d/(a-I*a*tan(d*x+c))/(a+I*a*tan(d*x+c))^(7/2)+99/320*I*a/d/(a+I*a*tan(
d*x+c))^(5/2)+33/128*I/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.14, antiderivative size = 248, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3487, 51, 63, 206}

$$-\frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{7/2}}-\frac{11ia^3}{16d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{7/2}}+\frac{99ia}{224d(a+ia\tan$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((-99*I)/256)*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a])])/(Sqrt
[2]*a^(3/2)*d) + (((99*I)/224)*a^2)/(d*(a + I*a*Tan[c + d*x])^(7/2)) - ((I/
4)*a^4)/(d*(a - I*a*Tan[c + d*x])^2*(a + I*a*Tan[c + d*x])^(7/2)) - (((11*I
)/16)*a^3)/(d*(a - I*a*Tan[c + d*x])*(a + I*a*Tan[c + d*x])^(7/2)) + (((99*
I)/320)*a)/(d*(a + I*a*Tan[c + d*x])^(5/2)) + ((33*I)/128)/(d*(a + I*a*Tan[
c + d*x])^(3/2)) + ((99*I)/256)/(a*d*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
```

```
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^4(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx = -\frac{\left(ia^5\right)\text{Subst}\left(\int \frac{1}{(a-x)^3(a+x)^{9/2}}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{7/2}} - \frac{\left(11ia^4\right)\text{Subst}\left(\int \frac{1}{(a-x)^2(a+x)^{9/2}}\,dx,\right.}{8d}$$

$$= -\frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{7/2}} - \frac{11ia^3}{16d(a-ia\tan(c+dx))(a+ia\tan}$$

$$= \frac{99ia^2}{224d(a+ia\tan(c+dx))^{7/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{7/2}} - \frac{}{16d}$$

$$= \frac{99ia^2}{224d(a+ia\tan(c+dx))^{7/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{7/2}} - \frac{}{16d}$$

$$= \frac{99ia^2}{224d(a+ia\tan(c+dx))^{7/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{7/2}} - \frac{}{16d}$$

$$= \frac{99ia^2}{224d(a+ia\tan(c+dx))^{7/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{7/2}} - \frac{}{16d}$$

$$= \frac{99ia^2}{224d(a+ia\tan(c+dx))^{7/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{7/2}} - \frac{}{16d}$$

$$= -\frac{99i\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{256\sqrt{2}a^{3/2}d} + \frac{99ia^2}{224d(a+ia\tan(c+dx))^{7/2}} - \frac{}{4d(a-ia\tan(c+dx}$$

Mathematica [A] time = 1.26, size = 168, normalized size = 0.68

$$-\frac{ie^{-7i(c+dx)}\sec(c+dx)\left(-328e^{2i(c+dx)}-1304e^{4i(c+dx)}-4584e^{6i(c+dx)}-2833e^{8i(c+dx)}+805e^{10i(c+dx)}+70e^{12i(c+dx)}+\right.}{17920ad\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] ((-1/17920*I)*(-40 - 328*E^((2*I)*(c + d*x)) - 1304*E^((4*I)*(c + d*x)) - 4
584*E^((6*I)*(c + d*x)) - 2833*E^((8*I)*(c + d*x)) + 805*E^((10*I)*(c + d*x
)) + 70*E^((12*I)*(c + d*x)) + 3465*E^((7*I)*(c + d*x))*Sqrt[1 + E^((2*I)*(
c + d*x))]*ArcSinh[E^(I*(c + d*x))])*Sec[c + d*x])/(a*d*E^((7*I)*(c + d*x))
*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.71, size = 316, normalized size = 1.27

$$\frac{\left(-3465i\sqrt{\frac{1}{2}}a^2d\sqrt{\frac{1}{a^3d^2}}e^{(7idx+7ic)}\log\left(4\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(a^2de^{(2idx+2ic)}+a^2d\right)\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\sqrt{\frac{1}{a^3d^2}}+ae^{(idx+ic)}\right)e^{(-idx-ic)}\right)+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/17920*(-3465*I*sqrt(1/2)*a^2*d*sqrt(1/(a^3*d^2))*e^(7*I*d*x + 7*I*c)*log(
4*(sqrt(2)*sqrt(1/2)*(a^2*d*e^(2*I*d*x + 2*I*c) + a^2*d)*sqrt(a/(e^(2*I*d*x
 + 2*I*c) + 1))*sqrt(1/(a^3*d^2)) + a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) +
3465*I*sqrt(1/2)*a^2*d*sqrt(1/(a^3*d^2))*e^(7*I*d*x + 7*I*c)*log(-4*(sqrt(2
)*sqrt(1/2)*(a^2*d*e^(2*I*d*x + 2*I*c) + a^2*d)*sqrt(a/(e^(2*I*d*x + 2*I*c)
 + 1))*sqrt(1/(a^3*d^2)) - a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) + sqrt(2)*s
qrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-70*I*e^(12*I*d*x + 12*I*c) - 805*I*e^(10
*I*d*x + 10*I*c) + 2833*I*e^(8*I*d*x + 8*I*c) + 4584*I*e^(6*I*d*x + 6*I*c)
+ 1304*I*e^(4*I*d*x + 4*I*c) + 328*I*e^(2*I*d*x + 2*I*c) + 40*I))*e^(-7*I*d
*x - 7*I*c)/(a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos(dx+c)^4}{(i\,a\tan(dx+c)+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(cos(d*x + c)^4/(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [A] time = 1.15, size = 395, normalized size = 1.59

$$\frac{\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(10240i\left(\cos^8(dx+c)\right)+10240\sin(dx+c)\left(\cos^7(dx+c)\right)+512i\left(\cos^6(dx+c)\right)+56\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] 1/35840/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(10240*I*cos(d*x+c
)^8+10240*sin(d*x+c)*cos(d*x+c)^7+512*I*cos(d*x+c)^6+5632*cos(d*x+c)^5*sin(
d*x+c)+3465*I*2^(1/2)*cos(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arcta
n(1/2*(I*cos(d*x+c)-I-sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))
^(1/2)*2^(1/2))+1056*I*cos(d*x+c)^4+3465*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(
1/2)*2^(1/2)*arctan(1/2*(I*cos(d*x+c)-I-sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+
c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))+3465*arctan(1/2*(I*cos(d*x+c)-I-sin(d*x+c
))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*sin(d*x+c)*2^(1
/2)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+7392*cos(d*x+c)^3*sin(d*x+c)+4620*
I*cos(d*x+c)^2+13860*cos(d*x+c)*sin(d*x+c))/a^2
```

maxima [A] time = 0.55, size = 207, normalized size = 0.83

$$\frac{i\left(\frac{3465\sqrt{2}\log\left(-\frac{\sqrt{2}\sqrt{a}-\sqrt{i\,a\tan(dx+c)+a}}{\sqrt{2}\sqrt{a}+\sqrt{i\,a\tan(dx+c)+a}}\right)}{\sqrt{a}}+\frac{4\left(3465(i\,a\tan(dx+c)+a)^5-11550(i\,a\tan(dx+c)+a)^4a+7392(i\,a\tan(dx+c)+a)^3a^2+2112(i\,a\tan(dx+\right.}{(i\,a\tan(dx+c)+a)^{\frac{11}{2}}-4(i\,a\tan(dx+c)+a)^{\frac{9}{2}}a+4(i\,a\tan(dx+c)+}\right.}{35840\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 1/35840*I*(3465*sqrt(2)*log(-(sqrt(2)*sqrt(a) - sqrt(I*a*tan(d*x + c) + a))
/(sqrt(2)*sqrt(a) + sqrt(I*a*tan(d*x + c) + a)))/sqrt(a) + 4*(3465*(I*a*tan
(d*x + c) + a)^5 - 11550*(I*a*tan(d*x + c) + a)^4*a + 7392*(I*a*tan(d*x + c
) + a)^3*a^2 + 2112*(I*a*tan(d*x + c) + a)^2*a^3 + 1408*(I*a*tan(d*x + c) +
```

```
 a)*a^4 + 1280*a^5)/((I*a*tan(d*x + c) + a)^(11/2) - 4*(I*a*tan(d*x + c) +
a)^(9/2)*a + 4*(I*a*tan(d*x + c) + a)^(7/2)*a^2))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\cos(c+d\,x)^4}{(a+a\tan(c+d\,x)\,1\mathrm{i})^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4/(a + a*tan(c + d*x)*1i)^(3/2),x)
```

```
[Out] int(cos(c + d*x)^4/(a + a*tan(c + d*x)*1i)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos^4(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral(cos(c + d*x)**4/(I*a*(tan(c + d*x) - I))**(3/2), x)
```

3.353 $\int \frac{\cos^6(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=321

$$-\frac{715i\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{2048\sqrt{2}a^{3/2}d}-\frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{9/2}}-\frac{5ia^5}{16d(a-ia\tan(c+dx))^2(a+ia\,\mathrm{t}}$$

```
[Out] -715/4096*I*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))/a^(3/2)/d
*2^(1/2)+715/2048*I/a/d/(a+I*a*tan(d*x+c))^(1/2)+715/1152*I*a^3/d/(a+I*a*ta
n(d*x+c))^(9/2)-1/6*I*a^6/d/(a-I*a*tan(d*x+c))^3/(a+I*a*tan(d*x+c))^(9/2)-5
/16*I*a^5/d/(a-I*a*tan(d*x+c))^2/(a+I*a*tan(d*x+c))^(9/2)-65/64*I*a^4/d/(a-
I*a*tan(d*x+c))/(a+I*a*tan(d*x+c))^(9/2)+715/1792*I*a^2/d/(a+I*a*tan(d*x+c)
)^(7/2)+143/512*I*a/d/(a+I*a*tan(d*x+c))^(5/2)+715/3072*I/d/(a+I*a*tan(d*x+
c))^(3/2)
```

Rubi [A] time = 0.18, antiderivative size = 321, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3487, 51, 63, 206}

$$-\frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{9/2}}-\frac{5ia^5}{16d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{9/2}}-\frac{\;}{64d(a-ia\,\mathrm{tan}}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^6/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((-715*I)/2048)*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a])])/(Sq
rt[2]*a^(3/2)*d) + (((715*I)/1152)*a^3)/(d*(a + I*a*Tan[c + d*x])^(9/2)) -
((I/6)*a^6)/(d*(a - I*a*Tan[c + d*x])^3*(a + I*a*Tan[c + d*x])^(9/2)) - (((
5*I)/16)*a^5)/(d*(a - I*a*Tan[c + d*x])^2*(a + I*a*Tan[c + d*x])^(9/2)) - (
((65*I)/64)*a^4)/(d*(a - I*a*Tan[c + d*x])*(a + I*a*Tan[c + d*x])^(9/2)) +
(((715*I)/1792)*a^2)/(d*(a + I*a*Tan[c + d*x])^(7/2)) + (((143*I)/512)*a)/(
d*(a + I*a*Tan[c + d*x])^(5/2)) + ((715*I)/3072)/(d*(a + I*a*Tan[c + d*x])^
(3/2)) + ((715*I)/2048)/(a*d*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^6(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx = -\frac{\left(ia^7\right)\text{Subst}\left(\int \frac{1}{(a-x)^4(a+x)^{11/2}}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{9/2}} - \frac{\left(5ia^6\right)\text{Subst}\left(\int \frac{1}{(a-x)^3(a+x)^{11/2}}\,dx,\right.}{4d}$$

$$= -\frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{9/2}} - \frac{5ia^5}{16d(a-ia\tan(c+dx))^2(a+ia\,\text{ta}}$$

$$= -\frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{9/2}} - \frac{5ia^5}{16d(a-ia\tan(c+dx))^2(a+ia\,\text{ta}}$$

$$= \frac{715ia^3}{1152d(a+ia\tan(c+dx))^{9/2}} - \frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{9/2}} - \frac{}{16}$$

$$= \frac{715ia^3}{1152d(a+ia\tan(c+dx))^{9/2}} - \frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{9/2}} - \frac{}{16}$$

$$= \frac{715ia^3}{1152d(a+ia\tan(c+dx))^{9/2}} - \frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{9/2}} - \frac{}{16}$$

$$= \frac{715ia^3}{1152d(a+ia\tan(c+dx))^{9/2}} - \frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{9/2}} - \frac{}{16}$$

$$= \frac{715ia^3}{1152d(a+ia\tan(c+dx))^{9/2}} - \frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{9/2}} - \frac{}{16}$$

$$= \frac{715ia^3}{1152d(a+ia\tan(c+dx))^{9/2}} - \frac{ia^6}{6d(a-ia\tan(c+dx))^3(a+ia\tan(c+dx))^{9/2}} - \frac{}{16}$$

$$= -\frac{715i\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{2048\sqrt{2}\,a^{3/2}d} + \frac{715ia^3}{1152d(a+ia\tan(c+dx))^{9/2}} - \frac{}{6d(a-ia\tan(c+}$$

Mathematica [A] time = 2.09, size = 203, normalized size = 0.63

$$\frac{ie^{-8i(c+dx)}\left(1136e^{2i(c+dx)}+5440e^{4i(c+dx)}+17344e^{6i(c+dx)}+57632e^{8i(c+dx)}+33301e^{10i(c+dx)}-13209e^{12i(c+dx)}-1974\right.}{129024ad\left(1+e^{2i(c+dx)}\right)\sqrt{a+ia\tan(c+}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^6/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] ((I/129024)*(112 + 1136*E^((2*I)*(c + d*x)) + 5440*E^((4*I)*(c + d*x)) + 17
344*E^((6*I)*(c + d*x)) + 57632*E^((8*I)*(c + d*x)) + 33301*E^((10*I)*(c +
d*x)) - 13209*E^((12*I)*(c + d*x)) - 1974*E^((14*I)*(c + d*x)) - 168*E^((16
```

```
*I)*(c + d*x)) - 45045*E^((9*I)*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x))]*Ar
cSinh[E^(I*(c + d*x))]))/(a*d*E^((8*I)*(c + d*x))*(1 + E^((2*I)*(c + d*x)))
*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.63, size = 338, normalized size = 1.05

$$\left(-45045i\sqrt{\frac{1}{2}}\,a^2d\sqrt{\frac{1}{a^3d^2}}\,e^{(9i\,dx+9i\,c)}\log\left(4\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(a^2de^{(2i\,dx+2i\,c)}+a^2d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{a^3d^2}}+ae^{(i\,dx+i\,c)}\right)e^{(-i\,dx-i}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/258048*(-45045*I*sqrt(1/2)*a^2*d*sqrt(1/(a^3*d^2))*e^(9*I*d*x + 9*I*c)*lo
g(4*(sqrt(2)*sqrt(1/2)*(a^2*d*e^(2*I*d*x + 2*I*c) + a^2*d)*sqrt(a/(e^(2*I*d
*x + 2*I*c) + 1))*sqrt(1/(a^3*d^2)) + a*e^(I*d*x + I*c))*e^(-I*d*x - I*c))
+ 45045*I*sqrt(1/2)*a^2*d*sqrt(1/(a^3*d^2))*e^(9*I*d*x + 9*I*c)*log(-4*(sqr
t(2)*sqrt(1/2)*(a^2*d*e^(2*I*d*x + 2*I*c) + a^2*d)*sqrt(a/(e^(2*I*d*x + 2*I
*c) + 1))*sqrt(1/(a^3*d^2)) - a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) + sqrt(2
)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-168*I*e^(16*I*d*x + 16*I*c) - 1974*I*
e^(14*I*d*x + 14*I*c) - 13209*I*e^(12*I*d*x + 12*I*c) + 33301*I*e^(10*I*d*x
 + 10*I*c) + 57632*I*e^(8*I*d*x + 8*I*c) + 17344*I*e^(6*I*d*x + 6*I*c) + 54
40*I*e^(4*I*d*x + 4*I*c) + 1136*I*e^(2*I*d*x + 2*I*c) + 112*I))*e^(-9*I*d*x
 - 9*I*c)/(a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos\left(dx+c\right)^6}{\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(cos(d*x + c)^6/(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [A] time = 1.42, size = 422, normalized size = 1.31

$$\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(114688i\left(\cos^{10}\left(dx+c\right)\right)+114688\sin\left(dx+c\right)\left(\cos^{9}\left(dx+c\right)\right)+4096i\left(\cos^{8}\left(dx+c\right)\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^6/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] 1/516096/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(114688*I*cos(d*x
+c)^10+114688*sin(d*x+c)*cos(d*x+c)^9+4096*I*cos(d*x+c)^8+61440*sin(d*x+c)*
cos(d*x+c)^7+6656*I*cos(d*x+c)^6+73216*cos(d*x+c)^5*sin(d*x+c)+13728*I*cos(
d*x+c)^4+45045*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)*arctan(1/2
*(I*cos(d*x+c)-I-sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2
)*2^(1/2))*2^(1/2)+45045*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)*arc
tan(1/2*(I*cos(d*x+c)-I-sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)
))^(1/2)*2^(1/2))+96096*cos(d*x+c)^3*sin(d*x+c)+45045*arctan(1/2*(I*cos(d*x
+c)-I-sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*
sin(d*x+c)*2^(1/2)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+60060*I*cos(d*x+c)^
2+180180*cos(d*x+c)*sin(d*x+c))/a^2
```

maxima [A] time = 0.81, size = 261, normalized size = 0.81

$$\frac{i\left(\frac{45045\sqrt{2}\log\left(-\frac{\sqrt{2}\sqrt{a}-\sqrt{ia\tan(dx+c)+a}}{\sqrt{2}\sqrt{a}+\sqrt{ia\tan(dx+c)+a}}\right)}{\sqrt{a}}+\frac{4\left(45045(ia\tan(dx+c)+a)^{7}-240240(ia\tan(dx+c)+a)^{6}a+396396(ia\tan(dx+c)+a)^{5}a^{2}-164736(ia\tan\cdots\right.}{(ia\tan(dx+c)+a)^{\frac{15}{2}}-6(ia\tan(dx+c)+a)^{\frac{13}{2}}a\cdots}\right.}{516096\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 1/516096*I*(45045*sqrt(2)*log(-(sqrt(2)*sqrt(a) - sqrt(I*a*tan(d*x + c) + a
))/(sqrt(2)*sqrt(a) + sqrt(I*a*tan(d*x + c) + a)))/sqrt(a) + 4*(45045*(I*a*
tan(d*x + c) + a)^7 - 240240*(I*a*tan(d*x + c) + a)^6*a + 396396*(I*a*tan(d
*x + c) + a)^5*a^2 - 164736*(I*a*tan(d*x + c) + a)^4*a^3 - 36608*(I*a*tan(d
*x + c) + a)^3*a^4 - 19968*(I*a*tan(d*x + c) + a)^2*a^5 - 15360*(I*a*tan(d*
x + c) + a)*a^6 - 14336*a^7)/((I*a*tan(d*x + c) + a)^(15/2) - 6*(I*a*tan(d*
x + c) + a)^(13/2)*a + 12*(I*a*tan(d*x + c) + a)^(11/2)*a^2 - 8*(I*a*tan(d*
x + c) + a)^(9/2)*a^3))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\cos(c+dx)^6}{(a+a\tan(c+dx)\,1\mathrm{i})^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^6/(a + a*tan(c + d*x)*1i)^(3/2),x)
```

```
[Out] int(cos(c + d*x)^6/(a + a*tan(c + d*x)*1i)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos^{6}(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**6/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral(cos(c + d*x)**6/(I*a*(tan(c + d*x) - I))**(3/2), x)
```

3.354 $\int \frac{\sec^{11}(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=147

$$\frac{256ia^4\sec^{11}(c+dx)}{12155d(a+ia\tan(c+dx))^{11/2}}+\frac{64ia^3\sec^{11}(c+dx)}{1105d(a+ia\tan(c+dx))^{9/2}}+\frac{8ia^2\sec^{11}(c+dx)}{85d(a+ia\tan(c+dx))^{7/2}}+\frac{2ia\sec^{11}(c+dx)}{17d(a+ia\tan(c+dx))^{5/2}}$$

```
[Out] 256/12155*I*a^4*sec(d*x+c)^11/d/(a+I*a*tan(d*x+c))^(11/2)+64/1105*I*a^3*sec
(d*x+c)^11/d/(a+I*a*tan(d*x+c))^(9/2)+8/85*I*a^2*sec(d*x+c)^11/d/(a+I*a*tan
(d*x+c))^(7/2)+2/17*I*a*sec(d*x+c)^11/d/(a+I*a*tan(d*x+c))^(5/2)
```

Rubi [A] time = 0.26, antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3494, 3493}

$$\frac{8ia^2\sec^{11}(c+dx)}{85d(a+ia\tan(c+dx))^{7/2}}+\frac{64ia^3\sec^{11}(c+dx)}{1105d(a+ia\tan(c+dx))^{9/2}}+\frac{256ia^4\sec^{11}(c+dx)}{12155d(a+ia\tan(c+dx))^{11/2}}+\frac{2ia\sec^{11}(c+dx)}{17d(a+ia\tan(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^11/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((256*I)/12155)*a^4*Sec[c + d*x]^11)/(d*(a + I*a*Tan[c + d*x])^(11/2)) + (
((64*I)/1105)*a^3*Sec[c + d*x]^11)/(d*(a + I*a*Tan[c + d*x])^(9/2)) + (((8*
I)/85)*a^2*Sec[c + d*x]^11)/(d*(a + I*a*Tan[c + d*x])^(7/2)) + (((2*I)/17)*
a*Sec[c + d*x]^11)/(d*(a + I*a*Tan[c + d*x])^(5/2))
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sec^{11}(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx &= \frac{2ia\sec^{11}(c+dx)}{17d(a+ia\tan(c+dx))^{5/2}}+\frac{1}{17}(12a)\int \frac{\sec^{11}(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx\\
&= \frac{8ia^2\sec^{11}(c+dx)}{85d(a+ia\tan(c+dx))^{7/2}}+\frac{2ia\sec^{11}(c+dx)}{17d(a+ia\tan(c+dx))^{5/2}}+\frac{1}{85}\left(32a^2\right)\int \frac{\sec^{11}(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx\\
&= \frac{64ia^3\sec^{11}(c+dx)}{1105d(a+ia\tan(c+dx))^{9/2}}+\frac{8ia^2\sec^{11}(c+dx)}{85d(a+ia\tan(c+dx))^{7/2}}+\frac{2ia\sec^{11}(c+dx)}{17d(a+ia\tan(c+dx))^{5/2}}+\ldots\\
&= \frac{256ia^4\sec^{11}(c+dx)}{12155d(a+ia\tan(c+dx))^{11/2}}+\frac{64ia^3\sec^{11}(c+dx)}{1105d(a+ia\tan(c+dx))^{9/2}}+\frac{8ia^2\sec^{11}(c+dx)}{85d(a+ia\tan(c+dx))^{7/2}}+\ldots
\end{aligned}$$

Mathematica [A] time = 0.99, size = 108, normalized size = 0.73

$$\frac{2\sec^9(c+dx)(\sin(4(c+dx))+i\cos(4(c+dx)))(-2242i\cos(2(c+dx))+374\tan(c+dx)+1089\sin(3(c+dx))\mathrm{s}}{12155ad(\tan(c+dx)-i)\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^11/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (2*Sec[c + d*x]^9*(I*Cos[4*(c + d*x)] + Sin[4*(c + d*x)])*(475*I - (2242*I)
*Cos[2*(c + d*x)] + 1089*Sec[c + d*x]*Sin[3*(c + d*x)] + 374*Tan[c + d*x]))
/(12155*a*d*(-I + Tan[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 2.15, size = 184, normalized size = 1.25

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(565760i\,e^{(6i\,dx+6i\,c)}+261120i\,e^{(4i\,dx+4i\,c)}+69632i\,e^{(2i\,dx+2i}\right.}{12155\left(a^2de^{(16i\,dx+16i\,c)}+8\,a^2de^{(14i\,dx+14i\,c)}+28\,a^2de^{(12i\,dx+12i\,c)}+56\,a^2de^{(10i\,dx+10i\,c)}+70\,a^2de^{(8i\,dx+8i\,c)}+56\,a^2de^{(6}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^11/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/12155*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(565760*I*e^(6*I*d*x + 6*
I*c) + 261120*I*e^(4*I*d*x + 4*I*c) + 69632*I*e^(2*I*d*x + 2*I*c) + 8192*I)
/(a^2*d*e^(16*I*d*x + 16*I*c) + 8*a^2*d*e^(14*I*d*x + 14*I*c) + 28*a^2*d*e^
(12*I*d*x + 12*I*c) + 56*a^2*d*e^(10*I*d*x + 10*I*c) + 70*a^2*d*e^(8*I*d*x
+ 8*I*c) + 56*a^2*d*e^(6*I*d*x + 6*I*c) + 28*a^2*d*e^(4*I*d*x + 4*I*c) + 8*
a^2*d*e^(2*I*d*x + 2*I*c) + a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)^{11}}{(i\,a\tan(dx+c)+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^11/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^11/(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [A] time = 6.82, size = 171, normalized size = 1.16

$$\frac{2\left(4096i\left(\cos^9(dx+c)\right)+4096\sin(dx+c)\left(\cos^8(dx+c)\right)-512i\left(\cos^7(dx+c)\right)+1536\sin(dx+c)\left(\cos^6(dx+\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^11/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] 2/12155/d*(4096*I*cos(d*x+c)^9+4096*sin(d*x+c)*cos(d*x+c)^8-512*I*cos(d*x+c
)^7+1536*sin(d*x+c)*cos(d*x+c)^6-160*I*cos(d*x+c)^5+1120*sin(d*x+c)*cos(d*x
+c)^4-84*I*cos(d*x+c)^3+924*cos(d*x+c)^2*sin(d*x+c)-1573*I*cos(d*x+c)-715*s
in(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^8/a^2
```

maxima [B] time = 1.12, size = 764, normalized size = 5.20

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^11/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] -2/12155*(-1767*I*sqrt(a) - 6854*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) +
2088*I*sqrt(a)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 16438*sqrt(a)*sin(d*x
+ c)^3/(cos(d*x + c) + 1)^3 - 5661*I*sqrt(a)*sin(d*x + c)^4/(cos(d*x + c) +
 1)^4 - 56984*sqrt(a)*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 13328*I*sqrt(a)
*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 - 129336*sqrt(a)*sin(d*x + c)^7/(cos(d
*x + c) + 1)^7 + 7514*I*sqrt(a)*sin(d*x + c)^8/(cos(d*x + c) + 1)^8 - 15646
8*sqrt(a)*sin(d*x + c)^9/(cos(d*x + c) + 1)^9 - 156468*sqrt(a)*sin(d*x + c)
^11/(cos(d*x + c) + 1)^11 - 7514*I*sqrt(a)*sin(d*x + c)^12/(cos(d*x + c) +
1)^12 - 129336*sqrt(a)*sin(d*x + c)^13/(cos(d*x + c) + 1)^13 + 13328*I*sqrt
(a)*sin(d*x + c)^14/(cos(d*x + c) + 1)^14 - 56984*sqrt(a)*sin(d*x + c)^15/(
cos(d*x + c) + 1)^15 + 5661*I*sqrt(a)*sin(d*x + c)^16/(cos(d*x + c) + 1)^16
 - 16438*sqrt(a)*sin(d*x + c)^17/(cos(d*x + c) + 1)^17 - 2088*I*sqrt(a)*sin
(d*x + c)^18/(cos(d*x + c) + 1)^18 - 6854*sqrt(a)*sin(d*x + c)^19/(cos(d*x
+ c) + 1)^19 + 1767*I*sqrt(a)*sin(d*x + c)^20/(cos(d*x + c) + 1)^20)*(sin(d
*x + c)/(cos(d*x + c) + 1) + 1)^(3/2)*(sin(d*x + c)/(cos(d*x + c) + 1) - 1)
^(3/2)/((a^2 - 10*a^2*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 45*a^2*sin(d*x
+ c)^4/(cos(d*x + c) + 1)^4 - 120*a^2*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 +
 210*a^2*sin(d*x + c)^8/(cos(d*x + c) + 1)^8 - 252*a^2*sin(d*x + c)^10/(cos
(d*x + c) + 1)^10 + 210*a^2*sin(d*x + c)^12/(cos(d*x + c) + 1)^12 - 120*a^2
*sin(d*x + c)^14/(cos(d*x + c) + 1)^14 + 45*a^2*sin(d*x + c)^16/(cos(d*x +
c) + 1)^16 - 10*a^2*sin(d*x + c)^18/(cos(d*x + c) + 1)^18 + a^2*sin(d*x + c
)^20/(cos(d*x + c) + 1)^20)*d*(-2*I*sin(d*x + c)/(cos(d*x + c) + 1) + sin(d
*x + c)^2/(cos(d*x + c) + 1)^2 - 1)^(3/2))
```

mupad [B] time = 9.86, size = 301, normalized size = 2.05

$$\frac{e^{-c\,1i-d\,x\,1i}\,\sqrt{a-\frac{a\,\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)\,1i}{e^{c\,2i+d\,x\,2i}+1}}\,512i}{11\,a^2\,d\,\left(e^{c\,2i+d\,x\,2i}+1\right)^5}-\frac{e^{-c\,1i-d\,x\,1i}\,\sqrt{a-\frac{a\,\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)\,1i}{e^{c\,2i+d\,x\,2i}+1}}\,1536i}{13\,a^2\,d\,\left(e^{c\,2i+d\,x\,2i}+1\right)^6}+\frac{e^{-c\,1i-d\,x\,1i}\,\sqrt{a-\frac{a\,\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)}{e^{c\,2i+d\,x\,2i}+1}}}{5\,a^2\,d\,\left(e^{c\,2i+d\,x\,2i}+1\right)^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^11*(a + a*tan(c + d*x)*1i)^(3/2)),x)
```

```
[Out] (exp(- c*1i - d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i +
d*x*2i) + 1))^(1/2)*512i)/(11*a^2*d*(exp(c*2i + d*x*2i) + 1)^5) - (exp(- c*
1i - d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) +
 1))^(1/2)*1536i)/(13*a^2*d*(exp(c*2i + d*x*2i) + 1)^6) + (exp(- c*1i - d*x
*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/
2)*512i)/(5*a^2*d*(exp(c*2i + d*x*2i) + 1)^7) - (exp(- c*1i - d*x*1i)*(a -
(a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*512i)/(
17*a^2*d*(exp(c*2i + d*x*2i) + 1)^8)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**11/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

3.355 $\int \frac{\sec^9(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=110

$$\frac{64ia^3\sec^9(c+dx)}{1287d(a+ia\tan(c+dx))^{9/2}}+\frac{16ia^2\sec^9(c+dx)}{143d(a+ia\tan(c+dx))^{7/2}}+\frac{2ia\sec^9(c+dx)}{13d(a+ia\tan(c+dx))^{5/2}}$$

```
[Out] 64/1287*I*a^3*sec(d*x+c)^9/d/(a+I*a*tan(d*x+c))^(9/2)+16/143*I*a^2*sec(d*x+
c)^9/d/(a+I*a*tan(d*x+c))^(7/2)+2/13*I*a*sec(d*x+c)^9/d/(a+I*a*tan(d*x+c))^
(5/2)
```

Rubi [A] time = 0.19, antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3494, 3493}

$$\frac{16ia^2\sec^9(c+dx)}{143d(a+ia\tan(c+dx))^{7/2}}+\frac{64ia^3\sec^9(c+dx)}{1287d(a+ia\tan(c+dx))^{9/2}}+\frac{2ia\sec^9(c+dx)}{13d(a+ia\tan(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^9/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((64*I)/1287)*a^3*Sec[c + d*x]^9)/(d*(a + I*a*Tan[c + d*x])^(9/2)) + (((16
*I)/143)*a^2*Sec[c + d*x]^9)/(d*(a + I*a*Tan[c + d*x])^(7/2)) + (((2*I)/13)
*a*Sec[c + d*x]^9)/(d*(a + I*a*Tan[c + d*x])^(5/2))
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] && !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^9(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx &= \frac{2ia\sec^9(c+dx)}{13d(a+ia\tan(c+dx))^{5/2}}+\frac{1}{13}(8a)\int \frac{\sec^9(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx\\ &= \frac{16ia^2\sec^9(c+dx)}{143d(a+ia\tan(c+dx))^{7/2}}+\frac{2ia\sec^9(c+dx)}{13d(a+ia\tan(c+dx))^{5/2}}+\frac{1}{143}\left(32a^2\right)\int \frac{\sec}{(a+ia\,\mathrm{t}}\\ &= \frac{64ia^3\sec^9(c+dx)}{1287d(a+ia\tan(c+dx))^{9/2}}+\frac{16ia^2\sec^9(c+dx)}{143d(a+ia\tan(c+dx))^{7/2}}+\frac{2ia\sec^9(c+dx)}{13d(a+ia\tan(c+d}\end{aligned}$$

Mathematica [A] time = 0.58, size = 92, normalized size = 0.84

$$\frac{2\sec^8(c+dx)(135i\sin(2(c+dx))+151\cos(2(c+dx))+52)(\cos(3(c+dx))-i\sin(3(c+dx)))}{1287ad(\tan(c+dx)-i)\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^9/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (2*Sec[c + d*x]^8*(52 + 151*Cos[2*(c + d*x)] + (135*I)*Sin[2*(c + d*x)])*(C
os[3*(c + d*x)] - I*Sin[3*(c + d*x)]))/(1287*a*d*(-I + Tan[c + d*x])*Sqrt[a
 + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.72, size = 143, normalized size = 1.30

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(18304i\,e^{(4i\,dx+4i\,c)}+6656i\,e^{(2i\,dx+2i\,c)}+1024i\right)}{1287\left(a^2de^{(12i\,dx+12i\,c)}+6\,a^2de^{(10i\,dx+10i\,c)}+15\,a^2de^{(8i\,dx+8i\,c)}+20\,a^2de^{(6i\,dx+6i\,c)}+15\,a^2de^{(4i\,dx+4i\,c)}+6\,a^2de^{(2i\,dx+}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/1287*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(18304*I*e^(4*I*d*x + 4*I*
c) + 6656*I*e^(2*I*d*x + 2*I*c) + 1024*I)/(a^2*d*e^(12*I*d*x + 12*I*c) + 6*
a^2*d*e^(10*I*d*x + 10*I*c) + 15*a^2*d*e^(8*I*d*x + 8*I*c) + 20*a^2*d*e^(6*
I*d*x + 6*I*c) + 15*a^2*d*e^(4*I*d*x + 4*I*c) + 6*a^2*d*e^(2*I*d*x + 2*I*c)
 + a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec\left(dx+c\right)^9}{\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^9/(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [A] time = 1.76, size = 144, normalized size = 1.31

$$\frac{2\left(512i\left(\cos^7\left(dx+c\right)\right)+512\sin\left(dx+c\right)\left(\cos^6\left(dx+c\right)\right)-64i\left(\cos^5\left(dx+c\right)\right)+192\sin\left(dx+c\right)\left(\cos^4\left(dx+c\right)\right.}{1287d\,\mathrm{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] 2/1287/d*(512*I*cos(d*x+c)^7+512*sin(d*x+c)*cos(d*x+c)^6-64*I*cos(d*x+c)^5+
192*sin(d*x+c)*cos(d*x+c)^4-20*I*cos(d*x+c)^3+140*cos(d*x+c)^2*sin(d*x+c)-2
25*I*cos(d*x+c)-99*sin(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/
2)/cos(d*x+c)^6/a^2
```

maxima [B] time = 1.13, size = 626, normalized size = 5.69

$$-\frac{2\left(-203i\sqrt{a}-\frac{678\sqrt{a}\sin(dx+c)}{\cos(dx+c)+1}-\frac{2i\sqrt{a}\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-\frac{1802\sqrt{a}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}-\frac{26i\sqrt{a}\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{3614\sqrt{a}\sin(dx+c)^5}{(\cos(dx+c)+1)^5}-\frac{858i\sqrt{a}\,\mathrm{s}}{(\cos(dx}\right.}{1287\left(a^2-\frac{8a^2\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{28a^2\sin(d}{(\cos(dx+c)}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] -2/1287*(-203*I*sqrt(a) - 678*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) - 2*I
*sqrt(a)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 1802*sqrt(a)*sin(d*x + c)^3/
(cos(d*x + c) + 1)^3 - 26*I*sqrt(a)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 3
614*sqrt(a)*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 858*I*sqrt(a)*sin(d*x + c
)^6/(cos(d*x + c) + 1)^6 - 6578*sqrt(a)*sin(d*x + c)^7/(cos(d*x + c) + 1)^7
 - 6578*sqrt(a)*sin(d*x + c)^9/(cos(d*x + c) + 1)^9 + 858*I*sqrt(a)*sin(d*x
 + c)^10/(cos(d*x + c) + 1)^10 - 3614*sqrt(a)*sin(d*x + c)^11/(cos(d*x + c)
 + 1)^11 + 26*I*sqrt(a)*sin(d*x + c)^12/(cos(d*x + c) + 1)^12 - 1802*sqrt(a
)*sin(d*x + c)^13/(cos(d*x + c) + 1)^13 + 2*I*sqrt(a)*sin(d*x + c)^14/(cos(
d*x + c) + 1)^14 - 678*sqrt(a)*sin(d*x + c)^15/(cos(d*x + c) + 1)^15 + 203*
I*sqrt(a)*sin(d*x + c)^16/(cos(d*x + c) + 1)^16)*(sin(d*x + c)/(cos(d*x + c
) + 1) + 1)^(3/2)*(sin(d*x + c)/(cos(d*x + c) + 1) - 1)^(3/2)/((a^2 - 8*a^2
*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 28*a^2*sin(d*x + c)^4/(cos(d*x + c)
+ 1)^4 - 56*a^2*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 + 70*a^2*sin(d*x + c)^8
/(cos(d*x + c) + 1)^8 - 56*a^2*sin(d*x + c)^10/(cos(d*x + c) + 1)^10 + 28*a
^2*sin(d*x + c)^12/(cos(d*x + c) + 1)^12 - 8*a^2*sin(d*x + c)^14/(cos(d*x +
 c) + 1)^14 + a^2*sin(d*x + c)^16/(cos(d*x + c) + 1)^16)*d*(-2*I*sin(d*x +
c)/(cos(d*x + c) + 1) + sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 1)^(3/2))
```

mupad [B] time = 8.30, size = 105, normalized size = 0.95

$$\frac{128\,\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\,\sqrt{a-\frac{a\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)\,1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,52\mathrm{i}+\mathrm{e}^{c\,4\mathrm{i}+d\,x\,4\mathrm{i}}\,143\mathrm{i}+8\mathrm{i}\right)}{1287\,a^2\,d\,{\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^9*(a + a*tan(c + d*x)*1i)^(3/2)),x)
```

```
[Out] (128*exp(- c*1i - d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2
i + d*x*2i) + 1))^(1/2)*(exp(c*2i + d*x*2i)*52i + exp(c*4i + d*x*4i)*143i +
 8i))/(1287*a^2*d*(exp(c*2i + d*x*2i) + 1)^6)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^{9}{\left(c + dx \right)}}{\left(ia \left(\tan{\left(c + dx \right)} - i\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**9/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral(sec(c + d*x)**9/(I*a*(tan(c + d*x) - I))**(3/2), x)
```

3.356 $\int \frac{\sec^7(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=73

$$\frac{8ia^2\sec^7(c+dx)}{63d(a+ia\tan(c+dx))^{7/2}}+\frac{2ia\sec^7(c+dx)}{9d(a+ia\tan(c+dx))^{5/2}}$$

```
[Out] 8/63*I*a^2*sec(d*x+c)^7/d/(a+I*a*tan(d*x+c))^(7/2)+2/9*I*a*sec(d*x+c)^7/d/(
a+I*a*tan(d*x+c))^(5/2)
```

Rubi [A] time = 0.13, antiderivative size = 73, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3494, 3493}

$$\frac{8ia^2\sec^7(c+dx)}{63d(a+ia\tan(c+dx))^{7/2}}+\frac{2ia\sec^7(c+dx)}{9d(a+ia\tan(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^7/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((8*I)/63)*a^2*Sec[c + d*x]^7)/(d*(a + I*a*Tan[c + d*x])^(7/2)) + (((2*I)/
9)*a*Sec[c + d*x]^7)/(d*(a + I*a*Tan[c + d*x])^(5/2))
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^7(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx&=\frac{2ia\sec^7(c+dx)}{9d(a+ia\tan(c+dx))^{5/2}}+\frac{1}{9}(4a)\int \frac{\sec^7(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx\\&=\frac{8ia^2\sec^7(c+dx)}{63d(a+ia\tan(c+dx))^{7/2}}+\frac{2ia\sec^7(c+dx)}{9d(a+ia\tan(c+dx))^{5/2}}\end{aligned}$$

Mathematica [A] time = 0.43, size = 80, normalized size = 1.10

$$\frac{2(7\tan(c+dx)-11i)\sec^5(c+dx)(\sin(2(c+dx))+i\cos(2(c+dx)))}{63ad(\tan(c+dx)-i)\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^7/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (2*Sec[c + d*x]^5*(I*Cos[2*(c + d*x)] + Sin[2*(c + d*x)])*(-11*I + 7*Tan[c
+ d*x]))/(63*a*d*(-I + Tan[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.82, size = 102, normalized size = 1.40

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(288i\,e^{(2i\,dx+2i\,c)}+64i\right)}{63\left(a^2de^{(8i\,dx+8i\,c)}+4\,a^2de^{(6i\,dx+6i\,c)}+6\,a^2de^{(4i\,dx+4i\,c)}+4\,a^2de^{(2i\,dx+2i\,c)}+a^2d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/63*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(288*I*e^(2*I*d*x + 2*I*c) +
 64*I)/(a^2*d*e^(8*I*d*x + 8*I*c) + 4*a^2*d*e^(6*I*d*x + 6*I*c) + 6*a^2*d*e
^(4*I*d*x + 4*I*c) + 4*a^2*d*e^(2*I*d*x + 2*I*c) + a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec\left(dx+c\right)^7}{\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^7/(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [A] time = 1.22, size = 117, normalized size = 1.60

$$\frac{2\left(32i\left(\cos^5\left(dx+c\right)\right)+32\sin\left(dx+c\right)\left(\cos^4\left(dx+c\right)\right)-4i\left(\cos^3\left(dx+c\right)\right)+12\left(\cos^2\left(dx+c\right)\right)\sin\left(dx+c\right)-17i\,\cdots}{63d\cos\left(dx+c\right)^4a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] 2/63/d*(32*I*cos(d*x+c)^5+32*sin(d*x+c)*cos(d*x+c)^4-4*I*cos(d*x+c)^3+12*co
s(d*x+c)^2*sin(d*x+c)-17*I*cos(d*x+c)-7*sin(d*x+c))*(a*(I*sin(d*x+c)+cos(d*
x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^4/a^2
```

maxima [B] time = 0.87, size = 488, normalized size = 6.68

$$-\frac{2\left(-11i\sqrt{a}-\frac{30\sqrt{a}\sin(dx+c)}{\cos(dx+c)+1}-\frac{12i\sqrt{a}\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-\frac{86\sqrt{a}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{9i\sqrt{a}\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{108\sqrt{a}\sin(dx+c)^5}{(\cos(dx+c)+1)^5}-\frac{108\sqrt{a}\sin(dx+c)^7}{(\cos(dx+c)+1)^7}\cdots\right.}{63\left(a^2-\frac{6a^2\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{15a^2\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{20a^2\sin(dx+c)^6}{(\cos(dx+c)+1)^6}+\frac{15a^2\sin(\cdots}{(\cos(dx+c\cdots}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] -2/63*(-11*I*sqrt(a) - 30*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) - 12*I*sq
rt(a)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 86*sqrt(a)*sin(d*x + c)^3/(cos(
d*x + c) + 1)^3 + 9*I*sqrt(a)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 108*sqr
t(a)*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 108*sqrt(a)*sin(d*x + c)^7/(cos(
d*x + c) + 1)^7 - 9*I*sqrt(a)*sin(d*x + c)^8/(cos(d*x + c) + 1)^8 - 86*sqrt
(a)*sin(d*x + c)^9/(cos(d*x + c) + 1)^9 + 12*I*sqrt(a)*sin(d*x + c)^10/(cos
(d*x + c) + 1)^10 - 30*sqrt(a)*sin(d*x + c)^11/(cos(d*x + c) + 1)^11 + 11*I
*sqrt(a)*sin(d*x + c)^12/(cos(d*x + c) + 1)^12)*(sin(d*x + c)/(cos(d*x + c)
```

```
 + 1) + 1)^(3/2)*(sin(d*x + c)/(cos(d*x + c) + 1) - 1)^(3/2)/((a^2 - 6*a^2*
sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 15*a^2*sin(d*x + c)^4/(cos(d*x + c) +
 1)^4 - 20*a^2*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 + 15*a^2*sin(d*x + c)^8/
(cos(d*x + c) + 1)^8 - 6*a^2*sin(d*x + c)^10/(cos(d*x + c) + 1)^10 + a^2*si
n(d*x + c)^12/(cos(d*x + c) + 1)^12)*d*(-2*I*sin(d*x + c)/(cos(d*x + c) + 1
) + sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 1)^(3/2))
```

mupad [B] time = 6.44, size = 91, normalized size = 1.25

$$\frac{32\,{\mathrm{e}}^{-c\,1{}\mathrm{i}-d\,x\,1{}\mathrm{i}}\,\left({\mathrm{e}}^{c\,2{}\mathrm{i}+d\,x\,2{}\mathrm{i}}\,9{}\mathrm{i}+2{}\mathrm{i}\right)\,\sqrt{a-\frac{a\,\left({\mathrm{e}}^{c\,2{}\mathrm{i}+d\,x\,2{}\mathrm{i}}\,1{}\mathrm{i}-\mathrm{i}\right)\,1{}\mathrm{i}}{{\mathrm{e}}^{c\,2{}\mathrm{i}+d\,x\,2{}\mathrm{i}}+1}}}{63\,a^2\,d\,{\left({\mathrm{e}}^{c\,2{}\mathrm{i}+d\,x\,2{}\mathrm{i}}+1\right)}^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^7*(a + a*tan(c + d*x)*1i)^(3/2)),x)
```

```
[Out] (32*exp(- c*1i - d*x*1i)*(exp(c*2i + d*x*2i)*9i + 2i)*(a - (a*(exp(c*2i + d
*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2))/(63*a^2*d*(exp(c*2i +
d*x*2i) + 1)^4)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^{7}{\left(c + dx \right)}}{\left(ia \left(\tan{\left(c + dx \right)} - i\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**7/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral(sec(c + d*x)**7/(I*a*(tan(c + d*x) - I))**(3/2), x)
```

3.357 $\int \frac{\sec^5(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=35

$$\frac{2ia\sec^5(c+dx)}{5d(a+ia\tan(c+dx))^{5/2}}$$

```
[Out] 2/5*I*a*sec(d*x+c)^5/d/(a+I*a*tan(d*x+c))^(5/2)
```

Rubi [A] time = 0.06, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.038$, Rules used = {3493}

$$\frac{2ia\sec^5(c+dx)}{5d(a+ia\tan(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^5/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((2*I)/5)*a*Sec[c + d*x]^5)/(d*(a + I*a*Tan[c + d*x])^(5/2))
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rubi steps

$$\int \frac{\sec^5(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx = \frac{2ia\sec^5(c+dx)}{5d(a+ia\tan(c+dx))^{5/2}}$$

Mathematica [A] time = 0.26, size = 59, normalized size = 1.69

$$\frac{2(1-i\tan(c+dx))\sec^3(c+dx)}{5ad(\tan(c+dx)-i)\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^5/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (2*Sec[c + d*x]^3*(1 - I*Tan[c + d*x]))/(5*a*d*(-I + Tan[c + d*x])*Sqrt[a +
 I*a*Tan[c + d*x]])
```

fricas [B] time = 0.57, size = 59, normalized size = 1.69

$$\frac{8i\sqrt{2}\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}}{5\left(a^2de^{(4idx+4ic)}+2a^2de^{(2idx+2ic)}+a^2d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 8/5*I*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))/(a^2*d*e^(4*I*d*x + 4*I*c)
+ 2*a^2*d*e^(2*I*d*x + 2*I*c) + a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec (dx + c)^5}{(i\,a\tan (dx + c) + a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^5/(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [B] time = 1.15, size = 90, normalized size = 2.57

$$\frac{2\left(4i\left(\cos^3 (dx+c)\right)+4\left(\cos^2 (dx+c)\right)\sin (dx+c)-3i\cos (dx+c)-\sin (dx+c)\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}}{5d\cos (dx+c)^2\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] 2/5/d*(4*I*cos(d*x+c)^3+4*cos(d*x+c)^2*sin(d*x+c)-3*I*cos(d*x+c)-sin(d*x+c)
)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^2/a^2
```

maxima [B] time = 0.75, size = 350, normalized size = 10.00

$$-\frac{2\left(-i\sqrt{a}-\frac{2\sqrt{a}\sin(dx+c)}{\cos(dx+c)+1}-\frac{2i\sqrt{a}\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-\frac{6\sqrt{a}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}-\frac{6\sqrt{a}\sin(dx+c)^5}{(\cos(dx+c)+1)^5}+\frac{2i\sqrt{a}\sin(dx+c)^6}{(\cos(dx+c)+1)^6}-\frac{2\sqrt{a}\sin(dx+c)^7}{(\cos(dx+c)+1)^7}+\frac{i\sqrt{a}}{(\cos}\right.}{5\left(a^2-\frac{4a^2\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{6a^2\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{4a^2\sin(dx+c)^6}{(\cos(dx+c)+1)^6}+\frac{a^2\sin(dx+c)^8}{(\cos(dx+c)+1)^8}\right)d\left(-\frac{2i\sin(dx+c)}{\cos(dx+c)+1}+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] -2/5*(-I*sqrt(a) - 2*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) - 2*I*sqrt(a)*
sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 6*sqrt(a)*sin(d*x + c)^3/(cos(d*x + c
) + 1)^3 - 6*sqrt(a)*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 + 2*I*sqrt(a)*sin(
d*x + c)^6/(cos(d*x + c) + 1)^6 - 2*sqrt(a)*sin(d*x + c)^7/(cos(d*x + c) +
1)^7 + I*sqrt(a)*sin(d*x + c)^8/(cos(d*x + c) + 1)^8)*(sin(d*x + c)/(cos(d*
x + c) + 1) + 1)^(3/2)*(sin(d*x + c)/(cos(d*x + c) + 1) - 1)^(3/2)/((a^2 -
4*a^2*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 6*a^2*sin(d*x + c)^4/(cos(d*x +
 c) + 1)^4 - 4*a^2*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 + a^2*sin(d*x + c)^8
/(cos(d*x + c) + 1)^8)*d*(-2*I*sin(d*x + c)/(cos(d*x + c) + 1) + sin(d*x +
c)^2/(cos(d*x + c) + 1)^2 - 1)^(3/2))
```

mupad [B] time = 1.70, size = 139, normalized size = 3.97

$$\frac{(\cos (d\,x)-\sin (d\,x)\,1\mathrm{i})\,(\cos(c)-\sin(c)\,1\mathrm{i})\,\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}\,(2\,\cos (2\,c+2\,d\,x)+\cos (4\,c+4\,d}{5\,a^2\,d\,(4\,\cos (2\,c+2\,d\,x)+\cos (4\,c+4\,d\,x)+3)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^(3/2)),x)
```

```
[Out] ((cos(d*x) - sin(d*x)*1i)*(cos(c) - sin(c)*1i)*((a*(cos(2*c + 2*d*x) + sin(
2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1))^(1/2)*(2*cos(2*c + 2*d*x) + c
os(4*c + 4*d*x) - sin(2*c + 2*d*x)*2i - sin(4*c + 4*d*x)*1i + 1)*4i)/(5*a^2
*d*(4*cos(2*c + 2*d*x) + cos(4*c + 4*d*x) + 3))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^5(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**5/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral(sec(c + d*x)**5/(I*a*(tan(c + d*x) - I))**(3/2), x)
```

3.358 $\int \frac{\sec^3(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=86

$$\frac{2i\sqrt{2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{a^{3/2}d}-\frac{2i\sec(c+dx)}{ad\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] 2*I*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2))*2^(1/2
)/a^(3/2)/d-2*I*sec(d*x+c)/a/d/(a+I*a*tan(d*x+c))^(1/2)
```

Rubi [A] time = 0.10, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.115, Rules used = {3491, 3489, 206}

$$\frac{2i\sqrt{2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{a^{3/2}d}-\frac{2i\sec(c+dx)}{ad\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] ((2*I)*Sqrt[2]*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[c +
 d*x]])])/(a^(3/2)*d) - ((2*I)*Sec[c + d*x])/(a*d*Sqrt[a + I*a*Tan[c + d*x]
])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3491

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e
+ f*x])^(n + 1))/(b*f*(m - 2)), x] + Dist[(2*d^2)/a, Int[(d*Sec[e + f*x])^(
m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f}, x] &&
 EqQ[a^2 + b^2, 0] && EqQ[m/2 + n, 0] && LtQ[n, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^3(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx &= -\frac{2i\sec(c+dx)}{ad\sqrt{a+ia\tan(c+dx)}}+\frac{2\int \frac{\sec(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx}{a}\\ &= -\frac{2i\sec(c+dx)}{ad\sqrt{a+ia\tan(c+dx)}}+\frac{(4i)\,\text{Subst}\left(\int \frac{1}{2-ax^2}\,dx,x,\frac{\sec(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\right)}{ad}\\ &= \frac{2i\sqrt{2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{a^{3/2}d}-\frac{2i\sec(c+dx)}{ad\sqrt{a+ia\tan(c+dx)}}\end{aligned}$$

Mathematica [A] time = 0.80, size = 101, normalized size = 1.17

$$\frac{8e^{3i(c+dx)}\left(-1+\sqrt{1+e^{2i(c+dx)}}\tanh^{-1}\left(\sqrt{1+e^{2i(c+dx)}}\right)\right)}{ad\left(1+e^{2i(c+dx)}\right)^2(\tan(c+dx)-i)\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^3/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (8*E^((3*I)*(c + d*x))*(-1 + Sqrt[1 + E^((2*I)*(c + d*x))]*ArcTanh[Sqrt[1 +
 E^((2*I)*(c + d*x))]]))/(a*d*(1 + E^((2*I)*(c + d*x)))^2*(-I + Tan[c + d*x
])*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [B] time = 0.60, size = 196, normalized size = 2.28

$$\frac{i\sqrt{2}a^2d\sqrt{\frac{1}{a^3d^2}}\log\left(\frac{\left(2\left(4iade^{(2idx+2ic)}+4iad\right)\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\sqrt{\frac{1}{a^3d^2}}+8i\right)e^{(-idx-ic)}}{ad}\right)-i\sqrt{2}a^2d\sqrt{\frac{1}{a^3d^2}}\log\left(\frac{\left(2\left(-4iade^{(2idx+2ic)}-4iad\right)\right.}{}\right.}{a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] (I*sqrt(2)*a^2*d*sqrt(1/(a^3*d^2))*log((2*(4*I*a*d*e^(2*I*d*x + 2*I*c) + 4*
I*a*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a^3*d^2)) + 8*I)*e^(-I*d*x
 - I*c)/(a*d)) - I*sqrt(2)*a^2*d*sqrt(1/(a^3*d^2))*log((2*(-4*I*a*d*e^(2*I*
d*x + 2*I*c) - 4*I*a*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a^3*d^2))
 + 8*I)*e^(-I*d*x - I*c)/(a*d)) - 2*I*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) +
 1)))/(a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)^3}{(ia\tan(dx+c)+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^3/(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [B] time = 1.15, size = 157, normalized size = 1.83

$$\frac{2\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(-\sqrt{2}\sin(dx+c)\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\arctan\left(\frac{(i\cos(dx+c)-i+\sin(dx+c))\sqrt{2}}{2\sin(dx+c)\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}}\right)+i\cos(dx+c)-i+\right.}{d(i\sin(dx+c)+\cos(dx+c)-1)a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] 2/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(-2^(1/2)*sin(d*x+c)*(-2
*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/si
n(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))+I*cos(d*x+c)-I+sin(d
*x+c))/(I*sin(d*x+c)+cos(d*x+c)-1)/a^2
```

maxima [B] time = 1.10, size = 814, normalized size = 9.47

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] -1/2*((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1
/4)*(2*sqrt(2)*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d
*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1
)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4
)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1) - 2*sqrt(2)
*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)
^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (cos(2*d*x
 + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arct
an2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 1) - I*sqrt(2)*log(sqrt(cos(
2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*cos(1/2*arcta
n2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + sqrt(cos(2*d*x + 2*c)^2 + s
in(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*sin(1/2*arctan2(sin(2*d*x + 2*c
), cos(2*d*x + 2*c) + 1))^2 + 2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 +
2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
 2*c) + 1)) + 1) + I*sqrt(2)*log(sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)
^2 + 2*cos(2*d*x + 2*c) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
2*c) + 1))^2 + sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x +
 2*c) + 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 - 2*(
cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos
(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1))*sqrt(a) - (-4*I
*sqrt(2)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 4*sqrt(
2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)))*sqrt(a))/((cos
(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*a^2*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\cos(c+d\,x)^3\,\left(a+a\tan(c+d\,x)\,1\mathrm{i}\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^(3/2)),x)
```

```
[Out] int(1/(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^3(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral(sec(c + d*x)**3/(I*a*(tan(c + d*x) - I))**(3/2), x)
```

3.359 $\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=87

$$\frac{i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{2\sqrt{2}\,a^{3/2}d}+\frac{i\sec(c+dx)}{2d(a+ia\tan(c+dx))^{3/2}}$$

```
[Out] 1/4*I*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2))/a^(3
/2)/d*2^(1/2)+1/2*I*sec(d*x+c)/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.08, antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3502, 3489, 206}

$$\frac{i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{2\sqrt{2}\,a^{3/2}d}+\frac{i\sec(c+dx)}{2d(a+ia\tan(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] ((I/2)*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[c + d*x]])]
)/(Sqrt[2]*a^(3/2)*d) + ((I/2)*Sec[c + d*x])/(d*(a + I*a*Tan[c + d*x])^(3/2
))
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx &= \frac{i\sec(c+dx)}{2d(a+ia\tan(c+dx))^{3/2}}+\frac{\int \frac{\sec(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx}{4a}\\ &= \frac{i\sec(c+dx)}{2d(a+ia\tan(c+dx))^{3/2}}+\frac{i\,\text{Subst}\left(\int \frac{1}{2-ax^2}\,dx,x,\frac{\sec(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\right)}{2ad}\\ &= \frac{i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{2\sqrt{2}\,a^{3/2}d}+\frac{i\sec(c+dx)}{2d(a+ia\tan(c+dx))^{3/2}}\end{aligned}$$

Mathematica [A] time = 0.70, size = 95, normalized size = 1.09

$$\frac{\sec(c+dx)\left(2+\frac{2e^{2i(c+dx)}\tanh^{-1}\left(\sqrt{1+e^{2i(c+dx)}}\right)}{\sqrt{1+e^{2i(c+dx)}}}\right)}{4ad(\tan(c+dx)-i)\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] ((2 + (2*E^((2*I)*(c + d*x))*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]])/Sqrt[1
 + E^((2*I)*(c + d*x))])*Sec[c + d*x])/(4*a*d*(-I + Tan[c + d*x])*Sqrt[a +
I*a*Tan[c + d*x]])
```

fricas [B] time = 0.74, size = 246, normalized size = 2.83

$$\frac{\left(i\sqrt{\frac{1}{2}}\,a^2d\sqrt{\frac{1}{a^3d^2}}\,e^{(2i\,dx+2i\,c)}\log\left(\frac{\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(i\,ade^{(2i\,dx+2i\,c)}+i\,ad\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{a^3d^2}}+i\right)e^{(-i\,dx-i\,c)}}{ad}\right)-i\sqrt{\frac{1}{2}}\,a^2d\sqrt{\frac{1}{a^3d^2}}\,e^{(2i\,dx+2i\,c)}}{4\,a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/4*(I*sqrt(1/2)*a^2*d*sqrt(1/(a^3*d^2))*e^(2*I*d*x + 2*I*c)*log((sqrt(2)*s
qrt(1/2)*(I*a*d*e^(2*I*d*x + 2*I*c) + I*a*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) +
1))*sqrt(1/(a^3*d^2)) + I)*e^(-I*d*x - I*c)/(a*d)) - I*sqrt(1/2)*a^2*d*sqrt
(1/(a^3*d^2))*e^(2*I*d*x + 2*I*c)*log((sqrt(2)*sqrt(1/2)*(-I*a*d*e^(2*I*d*x
 + 2*I*c) - I*a*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a^3*d^2)) + I)
*e^(-I*d*x - I*c)/(a*d)) + sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(I*e^(
2*I*d*x + 2*I*c) + I))*e^(-2*I*d*x - 2*I*c)/(a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)}{(i\,a\tan(dx+c)+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)/(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [B] time = 1.00, size = 318, normalized size = 3.66

$$\left(i\cos(dx+c)\sqrt{2}\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\arctan\left(\frac{(i\cos(dx+c)-i+\sin(dx+c))\sqrt{2}}{2\sin(dx+c)\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}}\right)+\sqrt{2}\sin(dx+c)\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\arctan\left(\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] 1/8/d*(I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+si
n(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)*
cos(d*x+c)+2^(1/2)*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1
/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*2^(1/2))+I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c
)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^
```

```
(1/2)+8*I*cos(d*x+c)^3+8*cos(d*x+c)^2*sin(d*x+c)-4*I*cos(d*x+c))*(a*(I*sin(
d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/a^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)}{(i\,a\tan(dx+c)+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(sec(d*x + c)/(I*a*tan(d*x + c) + a)^(3/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\cos(c+d\,x)\,\left(a+a\tan(c+d\,x)\,1\mathrm{i}\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^(3/2)),x)
```

```
[Out] int(1/(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral(sec(c + d*x)/(I*a*(tan(c + d*x) - I))**(3/2), x)
```

3.360 $\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=157

$$\frac{15i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{32\sqrt{2}\,a^{3/2}d}-\frac{15i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{32a^2d}+\frac{5i\cos(c+dx)}{16ad\sqrt{a+ia\tan(c+dx)}}+\frac{i\cos(c+}{4d(a+ia\tan(}$$

```
[Out] 15/64*I*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2))/a^
(3/2)/d*2^(1/2)+5/16*I*cos(d*x+c)/a/d/(a+I*a*tan(d*x+c))^(1/2)-15/32*I*cos(
d*x+c)*(a+I*a*tan(d*x+c))^(1/2)/a^2/d+1/4*I*cos(d*x+c)/d/(a+I*a*tan(d*x+c))
^(3/2)
```

Rubi [A] time = 0.19, antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {3502, 3490, 3489, 206}

$$-\frac{15i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{32a^2d}+\frac{15i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{32\sqrt{2}\,a^{3/2}d}+\frac{5i\cos(c+dx)}{16ad\sqrt{a+ia\tan(c+dx)}}+\frac{i\cos(c}{4d(a+ia\tan}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((15*I)/32)*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[c + d
*x]])])/(Sqrt[2]*a^(3/2)*d) + ((I/4)*Cos[c + d*x])/(d*(a + I*a*Tan[c + d*x]
)^(3/2)) + (((5*I)/16)*Cos[c + d*x])/(a*d*Sqrt[a + I*a*Tan[c + d*x]]) - (((
15*I)/32)*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])/(a^2*d)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3490

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] + Dist[a/(2*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b*Tan[e +
f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] &&
EqQ[m/2 + n, 0] && GtQ[n, 0]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx = \frac{i\cos(c+dx)}{4d(a+ia\tan(c+dx))^{3/2}} + \frac{5\int \frac{\cos(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx}{8a}$$

$$= \frac{i\cos(c+dx)}{4d(a+ia\tan(c+dx))^{3/2}} + \frac{5i\cos(c+dx)}{16ad\sqrt{a+ia\tan(c+dx)}} + \frac{15\int \cos(c+dx)\sqrt{a+ia\,\mathrm{t}}}{32a^2}$$

$$= \frac{i\cos(c+dx)}{4d(a+ia\tan(c+dx))^{3/2}} + \frac{5i\cos(c+dx)}{16ad\sqrt{a+ia\tan(c+dx)}} - \frac{15i\cos(c+dx)\sqrt{a+ia\tan}}{32a^2d}$$

$$= \frac{i\cos(c+dx)}{4d(a+ia\tan(c+dx))^{3/2}} + \frac{5i\cos(c+dx)}{16ad\sqrt{a+ia\tan(c+dx)}} - \frac{15i\cos(c+dx)\sqrt{a+ia\tan}}{32a^2d}$$

$$= \frac{15i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{32\sqrt{2}a^{3/2}d} + \frac{i\cos(c+dx)}{4d(a+ia\tan(c+dx))^{3/2}} + \frac{5i\cos(c+dx)}{16ad\sqrt{a+ia\tan(c+}}$$

Mathematica [A] time = 1.10, size = 120, normalized size = 0.76

$$\frac{\sec(c+dx)\left(\frac{30e^{2i(c+dx)}\tanh^{-1}\left(\sqrt{1+e^{2i(c+dx)}}\right)}{\sqrt{1+e^{2i(c+dx)}}} - 2(10i\sin(2(c+dx)) + 6\cos(2(c+dx)) - 9)\right)}{64ad(\tan(c+dx)-i)\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (Sec[c + d*x]*((30*E^((2*I)*(c + d*x))*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))
]])/Sqrt[1 + E^((2*I)*(c + d*x))] - 2*(-9 + 6*Cos[2*(c + d*x)] + (10*I)*Sin
[2*(c + d*x)])))/(64*a*d*(-I + Tan[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [B] time = 0.57, size = 270, normalized size = 1.72

$$\left(15i\sqrt{\frac{1}{2}}a^2d\sqrt{\frac{1}{a^3d^2}}e^{(4i\,dx+4i\,c)}\log\left(\frac{\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(240i\,ade^{(2i\,dx+2i\,c)}+240i\,ad\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{a^3d^2}}+240i\right)e^{(-i\,dx-i\,c)}}{256\,ad}\right) - 15i\sqrt{\frac{1}{2}}a^2d\sqrt{\frac{1}{a^3d^2}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/64*(15*I*sqrt(1/2)*a^2*d*sqrt(1/(a^3*d^2))*e^(4*I*d*x + 4*I*c)*log(1/256*
(sqrt(2)*sqrt(1/2)*(240*I*a*d*e^(2*I*d*x + 2*I*c) + 240*I*a*d)*sqrt(a/(e^(2
*I*d*x + 2*I*c) + 1))*sqrt(1/(a^3*d^2)) + 240*I)*e^(-I*d*x - I*c)/(a*d)) -
15*I*sqrt(1/2)*a^2*d*sqrt(1/(a^3*d^2))*e^(4*I*d*x + 4*I*c)*log(1/256*(sqrt(
2)*sqrt(1/2)*(-240*I*a*d*e^(2*I*d*x + 2*I*c) - 240*I*a*d)*sqrt(a/(e^(2*I*d*
x + 2*I*c) + 1))*sqrt(1/(a^3*d^2)) + 240*I)*e^(-I*d*x - I*c)/(a*d)) + sqrt(
2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-8*I*e^(6*I*d*x + 6*I*c) + I*e^(4*I*d
*x + 4*I*c) + 11*I*e^(2*I*d*x + 2*I*c) + 2*I))*e^(-4*I*d*x - 4*I*c)/(a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos(dx+c)}{(i\,a\tan(dx+c)+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")

[Out] integrate(cos(d*x + c)/(I*a*tan(d*x + c) + a)^(3/2), x)

maple [B] time = 1.04, size = 346, normalized size = 2.20

$$\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(64i\left(\cos^5(dx+c)\right)+15i\cos(dx+c)\sqrt{2}\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\arctan\left(\frac{(i\cos(dx+c)-i+\sin(dx+c))}{2\sin(dx+c)\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(cos(d*x+c)/(a+I*a*tan(d*x+c))^(3/2),x)

[Out] 1/128/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(64*I*cos(d*x+c)^5+15*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)*cos(d*x+c)+64*sin(d*x+c)*cos(d*x+c)^4+8*I*cos(d*x+c)^3+15*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)+15*2^(1/2)*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))+40*cos(d*x+c)^2*sin(d*x+c)-60*I*cos(d*x+c))/a^2

maxima [B] time = 1.05, size = 1820, normalized size = 11.59

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")

[Out] 1/256*((cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(3/4)*((36*I*sqrt(2)*cos(4*d*x + 4*c) + 36*sqrt(2)*sin(4*d*x + 4*c))*cos(3/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)) - 36*(sqrt(2)*cos(4*d*x + 4*c) - I*sqrt(2)*sin(4*d*x + 4*c))*sin(3/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)))*sqrt(a) + (cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*((-28*I*sqrt(2)*cos(4*d*x + 4*c) - 28*sqrt(2)*sin(4*d*x + 4*c) - 32*I*sqrt(2))*cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)) + 4*(7*sqrt(2)*cos(4*d*x + 4*c) - 7*I*sqrt(2)*sin(4*d*x + 4*c) + 8*sqrt(2))*sin(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)))*sqrt(a) - (30*sqrt(2)*arctan2((cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*sin(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)), (cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)) + 1) - 30*sqrt(2)*arctan2((cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*sin(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)), (cos(1/2*ar

```
ctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x +
4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x
+ 4*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4
*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)) -
 1) - 15*I*sqrt(2)*log(sqrt(cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4
*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/
2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)*cos(1/2*arctan2(sin(1/2
*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x +
4*c), cos(4*d*x + 4*c))) + 1))^2 + sqrt(cos(1/2*arctan2(sin(4*d*x + 4*c), c
os(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^
2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)*sin(1/2*arc
tan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(
sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1))^2 + 2*(cos(1/2*arctan2(sin(4*d*x
 + 4*c), cos(4*d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x
 + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(
1/4)*cos(1/2*arctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))),
cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)) + 1) + 15*I*sqrt
(2)*log(sqrt(cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + sin(1
/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*arctan2(sin(4
*d*x + 4*c), cos(4*d*x + 4*c))) + 1)*cos(1/2*arctan2(sin(1/2*arctan2(sin(4*
d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x
 + 4*c))) + 1))^2 + sqrt(cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)
))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2*cos(1/2*a
rctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)*sin(1/2*arctan2(sin(1/2*ar
ctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2(sin(4*d*x + 4*c
), cos(4*d*x + 4*c))) + 1))^2 - 2*(cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*
d*x + 4*c)))^2 + sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c)))^2 + 2
*cos(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)^(1/4)*cos(1/2*ar
ctan2(sin(1/2*arctan2(sin(4*d*x + 4*c), cos(4*d*x + 4*c))), cos(1/2*arctan2
(sin(4*d*x + 4*c), cos(4*d*x + 4*c))) + 1)) + 1))*sqrt(a))/(a^2*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\cos(c + d\,x)}{(a + a\tan(c + d\,x)\,1\mathrm{i})^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)/(a + a*tan(c + d*x)*1i)^(3/2),x)
```

```
[Out] int(cos(c + d*x)/(a + a*tan(c + d*x)*1i)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos(c + dx)}{(ia(\tan(c + dx) - i))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral(cos(c + d*x)/(I*a*(tan(c + d*x) - I))**(3/2), x)
```

3.361 $\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=233

$$\frac{105i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{256\sqrt{2}a^{3/2}d}-\frac{7i\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{32a^2d}-\frac{105i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{256a^2d}+$$

[Out] 105/512*I*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2))/a^(3/2)/d*2^(1/2)+35/128*I*cos(d*x+c)/a/d/(a+I*a*tan(d*x+c))^(1/2)+3/16*I*cos(d*x+c)^3/a/d/(a+I*a*tan(d*x+c))^(1/2)-105/256*I*cos(d*x+c)*(a+I*a*tan(d*x+c))^(1/2)/a^2/d-7/32*I*cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(1/2)/a^2/d+1/6*I*cos(d*x+c)^3/d/(a+I*a*tan(d*x+c))^(3/2)

Rubi [A] time = 0.34, antiderivative size = 233, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {3502, 3497, 3490, 3489, 206}

$$-\frac{7i\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{32a^2d}-\frac{105i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{256a^2d}+\frac{105i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{256\sqrt{2}a^{3/2}d}+$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((105*I)/256)*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[c +
 d*x]])])/(Sqrt[2]*a^(3/2)*d) + ((I/6)*Cos[c + d*x]^3)/(d*(a + I*a*Tan[c +
d*x])^(3/2)) + (((35*I)/128)*Cos[c + d*x])/(a*d*Sqrt[a + I*a*Tan[c + d*x]])
 + (((3*I)/16)*Cos[c + d*x]^3)/(a*d*Sqrt[a + I*a*Tan[c + d*x]]) - (((105*I)
/256)*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])/(a^2*d) - (((7*I)/32)*Cos[c
+ d*x]^3*Sqrt[a + I*a*Tan[c + d*x]])/(a^2*d)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3490

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] + Dist[a/(2*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b*Tan[e +
f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] &&
EqQ[m/2 + n, 0] && GtQ[n, 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
```

```
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx = \frac{i\cos^3(c+dx)}{6d(a+ia\tan(c+dx))^{3/2}} + \frac{3\int \frac{\cos^3(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx}{4a}$$
$$= \frac{i\cos^3(c+dx)}{6d(a+ia\tan(c+dx))^{3/2}} + \frac{3i\cos^3(c+dx)}{16ad\sqrt{a+ia\tan(c+dx)}} + \frac{21\int \cos^3(c+dx)\sqrt{a+ia}}{32a^2}$$
$$= \frac{i\cos^3(c+dx)}{6d(a+ia\tan(c+dx))^{3/2}} + \frac{3i\cos^3(c+dx)}{16ad\sqrt{a+ia\tan(c+dx)}} - \frac{7i\cos^3(c+dx)\sqrt{a+ia\tan}}{32a^2d}$$
$$= \frac{i\cos^3(c+dx)}{6d(a+ia\tan(c+dx))^{3/2}} + \frac{35i\cos(c+dx)}{128ad\sqrt{a+ia\tan(c+dx)}} + \frac{3i\cos^3(c+dx)}{16ad\sqrt{a+ia\tan(c+dx)}}$$
$$= \frac{i\cos^3(c+dx)}{6d(a+ia\tan(c+dx))^{3/2}} + \frac{35i\cos(c+dx)}{128ad\sqrt{a+ia\tan(c+dx)}} + \frac{3i\cos^3(c+dx)}{16ad\sqrt{a+ia\tan(c+dx)}}$$
$$= \frac{i\cos^3(c+dx)}{6d(a+ia\tan(c+dx))^{3/2}} + \frac{35i\cos(c+dx)}{128ad\sqrt{a+ia\tan(c+dx)}} + \frac{3i\cos^3(c+dx)}{16ad\sqrt{a+ia\tan(c+dx)}}$$
$$= \frac{105i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{256\sqrt{2}a^{3/2}d} + \frac{i\cos^3(c+dx)}{6d(a+ia\tan(c+dx))^{3/2}} + \frac{35i\cos(c+dx}{128ad\sqrt{a+ia\tan(c}$$

Mathematica [A] time = 1.70, size = 145, normalized size = 0.62

$$\frac{\sec(c+dx)\left(\frac{630e^{2i(c+dx)}\tanh^{-1}\left(\sqrt{1+e^{2i(c+dx)}}\right)}{\sqrt{1+e^{2i(c+dx)}}} - 2(3i(86\sin(2(c+dx)) + 8\sin(4(c+dx)) + 55i) + 158\cos(2(c+dx)) +\right.}{1536ad(\tan(c+dx)-i)\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (Sec[c + d*x]*((630*E^((2*I)*(c + d*x))*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x)
)]])/Sqrt[1 + E^((2*I)*(c + d*x))] - 2*(158*Cos[2*(c + d*x)] + 8*Cos[4*(c +
 d*x)] + (3*I)*(55*I + 86*Sin[2*(c + d*x)] + 8*Sin[4*(c + d*x)]))))/(1536*a
*d*(-I + Tan[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.58, size = 292, normalized size = 1.25

$$\left(315i\sqrt{\frac{1}{2}}a^2d\sqrt{\frac{1}{a^3d^2}}e^{(6i\,dx+6i\,c)}\log\left(\frac{\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(13440i\,ade^{(2i\,dx+2i\,c)}+13440i\,ad\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{a^3d^2}}+13440i\right)e^{(-i\,dx-i\,c)}}{16384\,ad}\right) - 315i\sqrt{\frac{1}{2}}a^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/1536*(315*I*sqrt(1/2)*a^2*d*sqrt(1/(a^3*d^2))*e^(6*I*d*x + 6*I*c)*log(1/1
6384*(sqrt(2)*sqrt(1/2)*(13440*I*a*d*e^(2*I*d*x + 2*I*c) + 13440*I*a*d)*sqr
t(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a^3*d^2)) + 13440*I)*e^(-I*d*x - I*c
)/(a*d)) - 315*I*sqrt(1/2)*a^2*d*sqrt(1/(a^3*d^2))*e^(6*I*d*x + 6*I*c)*log(
1/16384*(sqrt(2)*sqrt(1/2)*(-13440*I*a*d*e^(2*I*d*x + 2*I*c) - 13440*I*a*d)
*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a^3*d^2)) + 13440*I)*e^(-I*d*x -
 I*c)/(a*d)) + sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-16*I*e^(10*I*d*x
 + 10*I*c) - 224*I*e^(8*I*d*x + 8*I*c) - 43*I*e^(6*I*d*x + 6*I*c) + 215*I*e
^(4*I*d*x + 4*I*c) + 58*I*e^(2*I*d*x + 2*I*c) + 8*I))*e^(-6*I*d*x - 6*I*c)/
(a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos\left(dx+c\right)^{3}}{\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate(cos(d*x + c)^3/(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [A] time = 1.16, size = 373, normalized size = 1.60

$$\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(1024i\left(\cos^{7}(dx+c)\right)+1024\sin(dx+c)\left(\cos^{6}(dx+c)\right)+64i\left(\cos^{5}(dx+c)\right)+315i\,c\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] 1/3072/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(1024*I*cos(d*x+c)^
7+1024*sin(d*x+c)*cos(d*x+c)^6+64*I*cos(d*x+c)^5+315*I*(-2*cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(
d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)*cos(d*x+c)+576*sin(d*x+c)*cos
(d*x+c)^4+168*I*cos(d*x+c)^3+315*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arc
tan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)
))^(1/2)*2^(1/2))*2^(1/2)+315*2^(1/2)*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*2^(1/2))+840*cos(d*x+c)^2*sin(d*x+c)-1260*I*cos(d*x+
c))/a^2
```

maxima [B] time = 1.10, size = 2632, normalized size = 11.30

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] 1/6144*((cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + sin(1/3*a
rctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + 2*cos(1/3*arctan2(sin(6*d*x
 + 6*c), cos(6*d*x + 6*c))) + 1)^(3/4)*((32*I*sqrt(2)*cos(6*d*x + 6*c) + 36
0*I*sqrt(2)*cos(2/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 32*sqrt(
2)*sin(6*d*x + 6*c) + 360*sqrt(2)*sin(2/3*arctan2(sin(6*d*x + 6*c), cos(6*d
*x + 6*c))) - 64*I*sqrt(2))*cos(3/2*arctan2(sin(1/3*arctan2(sin(6*d*x + 6*c
```

), cos(6*d*x + 6*c))), cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))
 + 1)) - (32*sqrt(2)*cos(6*d*x + 6*c) + 360*sqrt(2)*cos(2/3*arctan2(sin(6*d
*x + 6*c), cos(6*d*x + 6*c))) - 32*I*sqrt(2)*sin(6*d*x + 6*c) - 360*I*sqrt(
2)*sin(2/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) - 64*sqrt(2))*sin(3
/2*arctan2(sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))), cos(1/3*ar
ctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)))*sqrt(a) + (cos(1/3*arctan
2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + sin(1/3*arctan2(sin(6*d*x + 6*c)
, cos(6*d*x + 6*c)))^2 + 2*cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*
c))) + 1)^(1/4)*(((12*I*sqrt(2)*cos(6*d*x + 6*c) + 12*sqrt(2)*sin(6*d*x + 6
*c))*cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + (12*I*sqrt(2)
*cos(6*d*x + 6*c) + 12*sqrt(2)*sin(6*d*x + 6*c))*sin(1/3*arctan2(sin(6*d*x
 + 6*c), cos(6*d*x + 6*c)))^2 + (24*I*sqrt(2)*cos(6*d*x + 6*c) + 24*sqrt(2)*
sin(6*d*x + 6*c))*cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 12
*I*sqrt(2)*cos(6*d*x + 6*c) + 12*sqrt(2)*sin(6*d*x + 6*c))*cos(5/2*arctan2(
sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))), cos(1/3*arctan2(sin(6
*d*x + 6*c), cos(6*d*x + 6*c))) + 1)) + (-12*I*sqrt(2)*cos(6*d*x + 6*c) - 2
16*I*sqrt(2)*cos(2/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 288*I*s
qrt(2)*cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) - 12*sqrt(2)*si
n(6*d*x + 6*c) - 216*sqrt(2)*sin(2/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x +
6*c))) + 288*sqrt(2)*sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) -
 768*I*sqrt(2))*cos(1/2*arctan2(sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x
 + 6*c))), cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)) - 12*
((sqrt(2)*cos(6*d*x + 6*c) - I*sqrt(2)*sin(6*d*x + 6*c))*cos(1/3*arctan2(si
n(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + (sqrt(2)*cos(6*d*x + 6*c) - I*sqrt(2
)*sin(6*d*x + 6*c))*sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2
 + 2*(sqrt(2)*cos(6*d*x + 6*c) - I*sqrt(2)*sin(6*d*x + 6*c))*cos(1/3*arctan2
(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + sqrt(2)*cos(6*d*x + 6*c) - I*sqrt(2
)*sin(6*d*x + 6*c))*sin(5/2*arctan2(sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6
*d*x + 6*c))), cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)) +
 (12*sqrt(2)*cos(6*d*x + 6*c) + 216*sqrt(2)*cos(2/3*arctan2(sin(6*d*x + 6*c
), cos(6*d*x + 6*c))) - 288*sqrt(2)*cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6
*d*x + 6*c))) - 12*I*sqrt(2)*sin(6*d*x + 6*c) - 216*I*sqrt(2)*sin(2/3*arcta
n2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 288*I*sqrt(2)*sin(1/3*arctan2(sin
(6*d*x + 6*c), cos(6*d*x + 6*c))) + 768*sqrt(2))*sin(1/2*arctan2(sin(1/3*ar
ctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))), cos(1/3*arctan2(sin(6*d*x + 6*c
), cos(6*d*x + 6*c))) + 1)))*sqrt(a) - (630*sqrt(2)*arctan2((cos(1/3*arctan
2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + sin(1/3*arctan2(sin(6*d*x + 6*c)
, cos(6*d*x + 6*c)))^2 + 2*cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*
c))) + 1)^(1/4)*sin(1/2*arctan2(sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x
 + 6*c))), cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)), (cos
(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + sin(1/3*arctan2(sin(6
*d*x + 6*c), cos(6*d*x + 6*c)))^2 + 2*cos(1/3*arctan2(sin(6*d*x + 6*c), cos
(6*d*x + 6*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(1/3*arctan2(sin(6*d*x + 6*c)
, cos(6*d*x + 6*c))), cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))
+ 1)) + 1) - 630*sqrt(2)*arctan2((cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d
*x + 6*c)))^2 + sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + 2*
cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)^(1/4)*sin(1/2*arc
tan2(sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))), cos(1/3*arctan2(
sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)), (cos(1/3*arctan2(sin(6*d*x + 6*
c), cos(6*d*x + 6*c)))^2 + sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*
c)))^2 + 2*cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)^(1/4)*
cos(1/2*arctan2(sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))), cos(1
/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)) - 1) - 315*I*sqrt(2)*
log(sqrt(cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + sin(1/3*a
rctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + 2*cos(1/3*arctan2(sin(6*d*x
 + 6*c), cos(6*d*x + 6*c))) + 1)*cos(1/2*arctan2(sin(1/3*arctan2(sin(6*d*x
+ 6*c), cos(6*d*x + 6*c))), cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6
*c))) + 1))^2 + sqrt(cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2
 + sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + 2*cos(1/3*arcta

```
n2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)*sin(1/2*arctan2(sin(1/3*arctan
2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))), cos(1/3*arctan2(sin(6*d*x + 6*c), c
os(6*d*x + 6*c))) + 1))^2 + 2*(cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x
+ 6*c)))^2 + sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + 2*cos
(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)^(1/4)*cos(1/2*arctan
2(sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))), cos(1/3*arctan2(sin
(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)) + 1) + 315*I*sqrt(2)*log(sqrt(cos(1
/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + sin(1/3*arctan2(sin(6*d
*x + 6*c), cos(6*d*x + 6*c)))^2 + 2*cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6
*d*x + 6*c))) + 1)*cos(1/2*arctan2(sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*
d*x + 6*c))), cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1))^2
+ sqrt(cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + sin(1/3*arc
tan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + 2*cos(1/3*arctan2(sin(6*d*x +
 6*c), cos(6*d*x + 6*c))) + 1)*sin(1/2*arctan2(sin(1/3*arctan2(sin(6*d*x +
6*c), cos(6*d*x + 6*c))), cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c
))) + 1))^2 - 2*(cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + s
in(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + 2*cos(1/3*arctan2(s
in(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(1/3*arct
an2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))), cos(1/3*arctan2(sin(6*d*x + 6*c),
 cos(6*d*x + 6*c))) + 1)) + 1))*sqrt(a))/(a^2*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\cos(c+dx)^3}{(a+a\tan(c+dx)\,1\mathrm{i})^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3/(a + a*tan(c + d*x)*1i)^(3/2),x)
```

```
[Out] int(cos(c + d*x)^3/(a + a*tan(c + d*x)*1i)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

3.362 $\int \frac{\sec^{10}(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=146

$$-\frac{2i(a+ia\tan(c+dx))^{13/2}}{13a^9d}+\frac{16i(a+ia\tan(c+dx))^{11/2}}{11a^8d}-\frac{16i(a+ia\tan(c+dx))^{9/2}}{3a^7d}+\frac{64i(a+ia\tan(c+dx))^{7/2}}{7a^6d}-32$$

```
[Out] -32/5*I*(a+I*a*tan(d*x+c))^(5/2)/a^5/d+64/7*I*(a+I*a*tan(d*x+c))^(7/2)/a^6/
d-16/3*I*(a+I*a*tan(d*x+c))^(9/2)/a^7/d+16/11*I*(a+I*a*tan(d*x+c))^(11/2)/a
^8/d-2/13*I*(a+I*a*tan(d*x+c))^(13/2)/a^9/d
```

Rubi [A] time = 0.09, antiderivative size = 146, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 43}

$$-\frac{2i(a+ia\tan(c+dx))^{13/2}}{13a^9d}+\frac{16i(a+ia\tan(c+dx))^{11/2}}{11a^8d}-\frac{16i(a+ia\tan(c+dx))^{9/2}}{3a^7d}+\frac{64i(a+ia\tan(c+dx))^{7/2}}{7a^6d}-32$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^10/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((-32*I)/5)*(a + I*a*Tan[c + d*x])^(5/2))/(a^5*d) + (((64*I)/7)*(a + I*a*T
an[c + d*x])^(7/2))/(a^6*d) - (((16*I)/3)*(a + I*a*Tan[c + d*x])^(9/2))/(a^
7*d) + (((16*I)/11)*(a + I*a*Tan[c + d*x])^(11/2))/(a^8*d) - (((2*I)/13)*(a
 + I*a*Tan[c + d*x])^(13/2))/(a^9*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^{10}(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^4(a+x)^{3/2}\,dx, x, ia\tan(c+dx)\right)}{a^9d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(16a^4(a+x)^{3/2}-32a^3(a+x)^{5/2}+24a^2(a+x)^{7/2}-8a(a+x)^{9/2}+(a+\right.\right.}{a^9d}\\ &= -\frac{32i(a+ia\tan(c+dx))^{5/2}}{5a^5d}+\frac{64i(a+ia\tan(c+dx))^{7/2}}{7a^6d}-\frac{16i(a+ia\tan(c+dx))^{9/2}}{3a^7d}\end{aligned}$$

Mathematica [A] time = 0.88, size = 116, normalized size = 0.79

$$\frac{2\sec^9(c+dx)(2600\sin(2(c+dx))+2875\sin(4(c+dx))+4264i\cos(2(c+dx))+3131i\cos(4(c+dx))+2288i)(}{15015a^2d(\tan(c+dx)-i)^2\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^10/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (2*Sec[c + d*x]^9*(2288*I + (4264*I)*Cos[2*(c + d*x)] + (3131*I)*Cos[4*(c +
 d*x)] + 2600*Sin[2*(c + d*x)] + 2875*Sin[4*(c + d*x)])*(Cos[5*(c + d*x)] +
 I*Sin[5*(c + d*x)]))/(15015*a^2*d*(-I + Tan[c + d*x])^2*Sqrt[a + I*a*Tan[c
 + d*x]])
```

fricas [A] time = 1.73, size = 175, normalized size = 1.20

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(-16384i\,e^{(13i\,dx+13i\,c)}-106496i\,e^{(11i\,dx+11i\,c)}-292864i\,e^{(9i\,dx+9i\,c)}-439296i\,e^{(7i\,dx+7i\,c)}-38438\right.}{15015\left(a^{3}de^{(12i\,dx+12i\,c)}+6\,a^{3}de^{(10i\,dx+10i\,c)}+15\,a^{3}de^{(8i\,dx+8i\,c)}+20\,a^{3}de^{(6i\,dx+6i\,c)}+15\,a^{3}de^{(4i\,dx+4i\,c)}+6\,a^{3}de^{(2i\,d}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/15015*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-16384*I*e^(13*I*d*x + 1
3*I*c) - 106496*I*e^(11*I*d*x + 11*I*c) - 292864*I*e^(9*I*d*x + 9*I*c) - 43
9296*I*e^(7*I*d*x + 7*I*c) - 384384*I*e^(5*I*d*x + 5*I*c))/(a^3*d*e^(12*I*d
*x + 12*I*c) + 6*a^3*d*e^(10*I*d*x + 10*I*c) + 15*a^3*d*e^(8*I*d*x + 8*I*c)
 + 20*a^3*d*e^(6*I*d*x + 6*I*c) + 15*a^3*d*e^(4*I*d*x + 4*I*c) + 6*a^3*d*e^
(2*I*d*x + 2*I*c) + a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec\left(dx+c\right)^{10}}{\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^10/(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [A] time = 1.83, size = 127, normalized size = 0.87

$$\frac{2\left(-4096i\left(\cos^{6}\left(dx+c\right)\right)+4096\left(\cos^{5}\left(dx+c\right)\right)\sin\left(dx+c\right)-512i\left(\cos^{4}\left(dx+c\right)\right)+2560\left(\cos^{3}\left(dx+c\right)\right)\sin\right.}{15015d\cos\left(dx+c\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 2/15015/d*(-4096*I*cos(d*x+c)^6+4096*cos(d*x+c)^5*sin(d*x+c)-512*I*cos(d*x+
c)^4+2560*cos(d*x+c)^3*sin(d*x+c)-6230*I*cos(d*x+c)^2-3990*cos(d*x+c)*sin(d
*x+c)+1155*I)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^6/a
^3
```

maxima [A] time = 0.37, size = 94, normalized size = 0.64

$$-\frac{2i\left(1155\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{13}{2}}-10920\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{11}{2}}a+40040\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{9}{2}}a^{2}-68640\left(i\right.\right.}{15015\,a^{9}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] -2/15015*I*(1155*(I*a*tan(d*x + c) + a)^(13/2) - 10920*(I*a*tan(d*x + c) +
a)^(11/2)*a + 40040*(I*a*tan(d*x + c) + a)^(9/2)*a^2 - 68640*(I*a*tan(d*x +
 c) + a)^(7/2)*a^3 + 48048*(I*a*tan(d*x + c) + a)^(5/2)*a^4)/(a^9*d)
```

mupad [B] time = 8.76, size = 434, normalized size = 2.97

$$-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,16384\mathrm{i}}{15015\,a^3\,d}-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,8192\mathrm{i}}{15015\,a^3\,d\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,2048\mathrm{i}}{5005\,a^3\,d\,{\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}^2}-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right.}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}}{3003\,a^3\,d\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\right.}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^10*(a + a*tan(c + d*x)*1i)^(5/2)),x)
```

```
[Out] ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*1
792i)/(143*a^3*d*(exp(c*2i + d*x*2i) + 1)^5) - ((a - (a*(exp(c*2i + d*x*2i)
*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*8192i)/(15015*a^3*d*(exp(c*2i
 + d*x*2i) + 1)) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*
x*2i) + 1))^(1/2)*2048i)/(5005*a^3*d*(exp(c*2i + d*x*2i) + 1)^2) - ((a - (a
*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*1024i)/(3
003*a^3*d*(exp(c*2i + d*x*2i) + 1)^3) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1
i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*128i)/(429*a^3*d*(exp(c*2i + d*x*2i)
 + 1)^4) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) +
1))^(1/2)*16384i)/(15015*a^3*d) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)
/(exp(c*2i + d*x*2i) + 1))^(1/2)*128i)/(13*a^3*d*(exp(c*2i + d*x*2i) + 1)^6
)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**10/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.363 $\int \frac{\sec^8(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=117

$$\frac{2i(a+ia\tan(c+dx))^{9/2}}{9a^7d}-\frac{12i(a+ia\tan(c+dx))^{7/2}}{7a^6d}+\frac{24i(a+ia\tan(c+dx))^{5/2}}{5a^5d}-\frac{16i(a+ia\tan(c+dx))^{3/2}}{3a^4d}$$

```
[Out] -16/3*I*(a+I*a*tan(d*x+c))^(3/2)/a^4/d+24/5*I*(a+I*a*tan(d*x+c))^(5/2)/a^5/
d-12/7*I*(a+I*a*tan(d*x+c))^(7/2)/a^6/d+2/9*I*(a+I*a*tan(d*x+c))^(9/2)/a^7/
d
```

Rubi [A] time = 0.09, antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 43}

$$\frac{2i(a+ia\tan(c+dx))^{9/2}}{9a^7d}-\frac{12i(a+ia\tan(c+dx))^{7/2}}{7a^6d}+\frac{24i(a+ia\tan(c+dx))^{5/2}}{5a^5d}-\frac{16i(a+ia\tan(c+dx))^{3/2}}{3a^4d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^8/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((-16*I)/3)*(a + I*a*Tan[c + d*x])^(3/2))/(a^4*d) + (((24*I)/5)*(a + I*a*T
an[c + d*x])^(5/2))/(a^5*d) - (((12*I)/7)*(a + I*a*Tan[c + d*x])^(7/2))/(a^
6*d) + (((2*I)/9)*(a + I*a*Tan[c + d*x])^(9/2))/(a^7*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^8(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^3\sqrt{a+x}\,dx, x, ia\tan(c+dx)\right)}{a^7d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(8a^3\sqrt{a+x}-12a^2(a+x)^{3/2}+6a(a+x)^{5/2}-(a+x)^{7/2}\right)dx, x, ia\tan(c+dx)\right)}{a^7d}\\ &= -\frac{16i(a+ia\tan(c+dx))^{3/2}}{3a^4d}+\frac{24i(a+ia\tan(c+dx))^{5/2}}{5a^5d}-\frac{12i(a+ia\tan(c+dx))^{7/2}}{7a^6d}\end{aligned}$$

Mathematica [A] time = 0.70, size = 108, normalized size = 0.92

$$\frac{2\sec^6(c+dx)(\cos(4(c+dx))+i\sin(4(c+dx)))(242i\cos(2(c+dx))+54\tan(c+dx)+89\sin(3(c+dx))\sec(}{315a^2d(\tan(c+dx)-i)^2\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^8/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (2*Sec[c + d*x]^6*(Cos[4*(c + d*x)] + I*Sin[4*(c + d*x)])*(77*I + (242*I)*C
os[2*(c + d*x)] + 89*Sec[c + d*x]*Sin[3*(c + d*x)] + 54*Tan[c + d*x]))/(315
*a^2*d*(-I + Tan[c + d*x])^2*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.65, size = 134, normalized size = 1.15

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(-512i\,e^{(9i\,dx+9i\,c)}-2304i\,e^{(7i\,dx+7i\,c)}-4032i\,e^{(5i\,dx+5i\,c)}-3360i\,e^{(3i\,dx+3i\,c)}\right)}{315\left(a^{3}de^{(8i\,dx+8i\,c)}+4\,a^{3}de^{(6i\,dx+6i\,c)}+6\,a^{3}de^{(4i\,dx+4i\,c)}+4\,a^{3}de^{(2i\,dx+2i\,c)}+a^{3}d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/315*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-512*I*e^(9*I*d*x + 9*I*c)
 - 2304*I*e^(7*I*d*x + 7*I*c) - 4032*I*e^(5*I*d*x + 5*I*c) - 3360*I*e^(3*I*
d*x + 3*I*c))/(a^3*d*e^(8*I*d*x + 8*I*c) + 4*a^3*d*e^(6*I*d*x + 6*I*c) + 6*
a^3*d*e^(4*I*d*x + 4*I*c) + 4*a^3*d*e^(2*I*d*x + 2*I*c) + a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec\left(dx+c\right)^{8}}{\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^8/(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [A] time = 1.27, size = 100, normalized size = 0.85

$$-\frac{2\left(128i\left(\cos^{4}\left(dx+c\right)\right)-128\left(\cos^{3}\left(dx+c\right)\right)\sin\left(dx+c\right)+226i\left(\cos^{2}\left(dx+c\right)\right)+130\cos\left(dx+c\right)\sin\left(dx+c\right)-\right.}{315d\cos\left(dx+c\right)^{4}a^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] -2/315/d*(128*I*cos(d*x+c)^4-128*cos(d*x+c)^3*sin(d*x+c)+226*I*cos(d*x+c)^2
+130*cos(d*x+c)*sin(d*x+c)-35*I)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(
1/2)/cos(d*x+c)^4/a^3
```

maxima [A] time = 0.60, size = 76, normalized size = 0.65

$$\frac{2i\left(35\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{9}{2}}-270\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{7}{2}}a+756\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{5}{2}}a^{2}-840\left(i\,a\tan\left(dx+c\right)+\right.\right.}{315\,a^{7}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] 2/315*I*(35*(I*a*tan(d*x + c) + a)^(9/2) - 270*(I*a*tan(d*x + c) + a)^(7/2)
*a + 756*(I*a*tan(d*x + c) + a)^(5/2)*a^2 - 840*(I*a*tan(d*x + c) + a)^(3/2
)*a^3)/(a^7*d)
```

mupad [B] time = 6.68, size = 306, normalized size = 2.62

$$-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,512\mathrm{i}}{315\,a^{3}\,d}-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,256\mathrm{i}}{315\,a^{3}\,d\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,64\mathrm{i}}{105\,a^{3}\,d\,{\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}^{2}}-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,32\mathrm{i}}{63\,a^{3}\,d\,{\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^8*(a + a*tan(c + d*x)*1i)^(5/2)),x)
```

```
[Out] ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*3
2i)/(9*a^3*d*(exp(c*2i + d*x*2i) + 1)^4) - ((a - (a*(exp(c*2i + d*x*2i)*1i
- 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*256i)/(315*a^3*d*(exp(c*2i + d*x*
2i) + 1)) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) +
 1))^(1/2)*64i)/(105*a^3*d*(exp(c*2i + d*x*2i) + 1)^2) - ((a - (a*(exp(c*2i
 + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*32i)/(63*a^3*d*(exp
(c*2i + d*x*2i) + 1)^3) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*
2i + d*x*2i) + 1))^(1/2)*512i)/(315*a^3*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^8(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Integral(sec(c + d*x)**8/(I*a*(tan(c + d*x) - I))**(5/2), x)
```

3.364 $\int \frac{\sec^6(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=86

$$-\frac{2i(a+ia\tan(c+dx))^{5/2}}{5a^5d}+\frac{8i(a+ia\tan(c+dx))^{3/2}}{3a^4d}-\frac{8i\sqrt{a+ia\tan(c+dx)}}{a^3d}$$

```
[Out] -8*I*(a+I*a*tan(d*x+c))^(1/2)/a^3/d+8/3*I*(a+I*a*tan(d*x+c))^(3/2)/a^4/d-2/
5*I*(a+I*a*tan(d*x+c))^(5/2)/a^5/d
```

Rubi [A] time = 0.08, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = $\{3487, 43\}$

$$-\frac{2i(a+ia\tan(c+dx))^{5/2}}{5a^5d}+\frac{8i(a+ia\tan(c+dx))^{3/2}}{3a^4d}-\frac{8i\sqrt{a+ia\tan(c+dx)}}{a^3d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((-8*I)*Sqrt[a + I*a*Tan[c + d*x]])/(a^3*d) + (((8*I)/3)*(a + I*a*Tan[c + d
*x])^(3/2))/(a^4*d) - (((2*I)/5)*(a + I*a*Tan[c + d*x])^(5/2))/(a^5*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^6(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{(a-x)^2}{\sqrt{a+x}}\,dx, x, ia\tan(c+dx)\right)}{a^5d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(\frac{4a^2}{\sqrt{a+x}}-4a\sqrt{a+x}+(a+x)^{3/2}\right)dx, x, ia\tan(c+dx)\right)}{a^5d}\\ &= -\frac{8i\sqrt{a+ia\tan(c+dx)}}{a^3d}+\frac{8i(a+ia\tan(c+dx))^{3/2}}{3a^4d}-\frac{2i(a+ia\tan(c+dx))^{5/2}}{5a^5d}\end{aligned}$$

Mathematica [A] time = 0.43, size = 94, normalized size = 1.09

$$\frac{2\sec^5(c+dx)(7\sin(2(c+dx))+23i\cos(2(c+dx))+20i)(\cos(3(c+dx))+i\sin(3(c+dx)))}{15a^2d(\tan(c+dx)-i)^2\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (2*Sec[c + d*x]^5*(20*I + (23*I)*Cos[2*(c + d*x)] + 7*Sin[2*(c + d*x)])*(Co
s[3*(c + d*x)] + I*Sin[3*(c + d*x)]))/(15*a^2*d*(-I + Tan[c + d*x])^2*Sqrt[
a + I*a*Tan[c + d*x]])
```

fricas [A] time = 1.12, size = 93, normalized size = 1.08

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(-64i\,e^{(5i\,dx+5i\,c)} - 160i\,e^{(3i\,dx+3i\,c)} - 120i\,e^{(i\,dx+i\,c)}\right)}{15\left(a^3de^{(4i\,dx+4i\,c)} + 2\,a^3de^{(2i\,dx+2i\,c)} + a^3d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/15*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-64*I*e^(5*I*d*x + 5*I*c) -
 160*I*e^(3*I*d*x + 3*I*c) - 120*I*e^(I*d*x + I*c))/(a^3*d*e^(4*I*d*x + 4*I
*c) + 2*a^3*d*e^(2*I*d*x + 2*I*c) + a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec\left(dx+c\right)^6}{\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^6/(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [A] time = 1.18, size = 73, normalized size = 0.85

$$-\frac{2\left(46i\left(\cos^2\left(dx+c\right)\right)+14\cos\left(dx+c\right)\sin\left(dx+c\right)-3i\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}}{15d\cos\left(dx+c\right)^2a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] -2/15/d*(46*I*cos(d*x+c)^2+14*cos(d*x+c)*sin(d*x+c)-3*I)*(a*(I*sin(d*x+c)+c
os(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^2/a^3
```

maxima [A] time = 0.32, size = 58, normalized size = 0.67

$$-\frac{2i\left(3\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{5}{2}}-20\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{3}{2}}a+60\sqrt{i\,a\tan\left(dx+c\right)+a}\,a^2\right)}{15\,a^5d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] -2/15*I*(3*(I*a*tan(d*x + c) + a)^(5/2) - 20*(I*a*tan(d*x + c) + a)^(3/2)*a
 + 60*sqrt(I*a*tan(d*x + c) + a)*a^2)/(a^5*d)
```

mupad [B] time = 1.23, size = 155, normalized size = 1.80

$$-\frac{4\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}\,\left(\cos\left(2\,c+2\,d\,x\right)\,321\mathrm{i}+\cos\left(4\,c+4\,d\,x\right)\,132\mathrm{i}+\cos\left(6\,c+6\,d\,x\right)\,23\mathrm{i}+35\,\mathrm{s}\right.}{15\,a^3\,d\,\left(15\,\cos\left(2\,c+2\,d\,x\right)+6\,\cos\left(4\,c+4\,d\,x\right)+\cos\left(6\,c\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^(5/2)),x)
```

```
[Out] -(4*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1
))^(1/2)*(cos(2*c + 2*d*x)*321i + cos(4*c + 4*d*x)*132i + cos(6*c + 6*d*x)*
23i + 35*sin(2*c + 2*d*x) + 28*sin(4*c + 4*d*x) + 7*sin(6*c + 6*d*x) + 212i
))/(15*a^3*d*(15*cos(2*c + 2*d*x) + 6*cos(4*c + 4*d*x) + cos(6*c + 6*d*x) +
 10))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^6(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Integral(sec(c + d*x)**6/(I*a*(tan(c + d*x) - I))**(5/2), x)
```

3.365 $\int \frac{\sec^4(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=55

$$\frac{2i\sqrt{a+ia\tan(c+dx)}}{a^3d}+\frac{4i}{a^2d\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] 4*I/a^2/d/(a+I*a*tan(d*x+c))^(1/2)+2*I*(a+I*a*tan(d*x+c))^(1/2)/a^3/d
```

Rubi [A] time = 0.07, antiderivative size = 55, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 43}

$$\frac{2i\sqrt{a+ia\tan(c+dx)}}{a^3d}+\frac{4i}{a^2d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (4*I)/(a^2*d*Sqrt[a + I*a*Tan[c + d*x]]) + ((2*I)*Sqrt[a + I*a*Tan[c + d*x]
])/(a^3*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^4(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{a-x}{(a+x)^{3/2}}\,dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(\frac{2a}{(a+x)^{3/2}}-\frac{1}{\sqrt{a+x}}\right)dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= \frac{4i}{a^2d\sqrt{a+ia\tan(c+dx)}}+\frac{2i\sqrt{a+ia\tan(c+dx)}}{a^3d}\end{aligned}$$

Mathematica [A] time = 0.29, size = 36, normalized size = 0.65

$$\frac{-2\tan(c+dx)+6i}{a^2d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (6*I - 2*Tan[c + d*x])/(a^2*d*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.53, size = 49, normalized size = 0.89

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(4i\,e^{(2i\,dx+2i\,c)}+2i\right)e^{(-i\,dx-i\,c)}}{a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
[Out] sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(4*I*e^(2*I*d*x + 2*I*c) + 2*I)*e
^(-I*d*x - I*c)/(a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)^4}{(i\,a\tan(dx+c)+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
[Out] integrate(sec(d*x + c)^4/(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [A] time = 1.16, size = 65, normalized size = 1.18

$$\frac{2\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(2\cos(dx+c)\sin(dx+c)+i+2i\left(\cos^2(dx+c)\right)\right)}{d\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^(5/2),x)
[Out] 2/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(2*cos(d*x+c)*sin(d*x+c)
+I+2*I*cos(d*x+c)^2)/a^3
```

maxima [A] time = 0.45, size = 44, normalized size = 0.80

$$\frac{2i\left(\frac{\sqrt{i\,a\tan(dx+c)+a}}{a^2}+\frac{2}{\sqrt{i\,a\tan(dx+c)+a}\,a}\right)}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
[Out] 2*I*(sqrt(I*a*tan(d*x + c) + a)/a^2 + 2/(sqrt(I*a*tan(d*x + c) + a)*a))/(a*
d)
```

mupad [B] time = 0.27, size = 72, normalized size = 1.31

$$\frac{2\ (\cos(2\,c+2\,d\,x)\,1\mathrm{i}+\sin(2\,c+2\,d\,x)+2\mathrm{i})\ \sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}}{a^3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^(5/2)),x)
[Out] (2*(cos(2*c + 2*d*x)*1i + sin(2*c + 2*d*x) + 2i)*((a*(cos(2*c + 2*d*x) + si
n(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1))^(1/2))/(a^3*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^4(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Integral(sec(c + d*x)**4/(I*a*(tan(c + d*x) - I))**(5/2), x)
```

3.366 $\int \frac{\sec^2(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=29

$$\frac{2i}{3ad(a+ia\tan(c+dx))^{3/2}}$$

```
[Out] 2/3*I/a/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.06, antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = $\{3487, 32\}$

$$\frac{2i}{3ad(a+ia\tan(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((2*I)/3)/(a*d*(a + I*a*Tan[c + d*x])^(3/2))
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^2(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{1}{(a+x)^{5/2}}\,dx, x, ia\tan(c+dx)\right)}{ad}\\ &= \frac{2i}{3ad(a+ia\tan(c+dx))^{3/2}}\end{aligned}$$

Mathematica [A] time = 0.24, size = 39, normalized size = 1.34

$$\frac{2}{3a^2d(\tan(c+dx)-i)\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] 2/(3*a^2*d*(-I + Tan[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [B] time = 0.51, size = 61, normalized size = 2.10

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(i\,e^{(4i\,dx+4i\,c)}+2i\,e^{(2i\,dx+2i\,c)}+i\right)e^{(-3i\,dx-3i\,c)}}{6\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/6*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(I*e^(4*I*d*x + 4*I*c) + 2*I*
e^(2*I*d*x + 2*I*c) + I)*e^(-3*I*d*x - 3*I*c)/(a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)^2}{(i\,a\tan(dx+c)+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^2/(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [A] time = 0.19, size = 24, normalized size = 0.83

$$\frac{2i}{3ad\,(a+ia\tan(dx+c))^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 2/3*I/a/d/(a+I*a*tan(d*x+c))^(3/2)
```

maxima [A] time = 0.56, size = 21, normalized size = 0.72

$$\frac{2i}{3\,(i\,a\tan(dx+c)+a)^{\frac{3}{2}}ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] 2/3*I/((I*a*tan(d*x + c) + a)^(3/2)*a*d)
```

mupad [B] time = 3.58, size = 23, normalized size = 0.79

$$\frac{2\mathrm{i}}{3\,a\,d\,(a+a\tan(c+d\,x)\,1\mathrm{i})^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^(5/2)),x)
```

```
[Out] 2i/(3*a*d*(a + a*tan(c + d*x)*1i)^(3/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^2(c+dx)}{(ia\,(\tan(c+dx)-i))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Integral(sec(c + d*x)**2/(I*a*(tan(c + d*x) - I))**(5/2), x)
```

3.367 $\int \frac{\cos^2(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=204

$$-\frac{9i\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{32\sqrt{2}\,a^{5/2}d}-\frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{7/2}}+\frac{9i}{32a^2d\sqrt{a+ia\tan(c+dx)}}+\frac{}{28d(a+i\ldots}$$

```
[Out] -9/64*I*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))/a^(5/2)/d*2^(
1/2)+9/32*I/a^2/d/(a+I*a*tan(d*x+c))^(1/2)+9/28*I*a/d/(a+I*a*tan(d*x+c))^(7
/2)-1/2*I*a^2/d/(a-I*a*tan(d*x+c))/(a+I*a*tan(d*x+c))^(7/2)+9/40*I/d/(a+I*a
*tan(d*x+c))^(5/2)+3/16*I/a/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.13, antiderivative size = 204, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3487, 51, 63, 206}

$$-\frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{7/2}}+\frac{9i}{32a^2d\sqrt{a+ia\tan(c+dx)}}-\frac{9i\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{32\sqrt{2}\,a^{5/2}d}+\frac{}{28d(a+i\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((-9*I)/32)*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a])])/(Sqrt[2
]*a^(5/2)*d) + (((9*I)/28)*a)/(d*(a + I*a*Tan[c + d*x])^(7/2)) - ((I/2)*a^2
)/(d*(a - I*a*Tan[c + d*x])*(a + I*a*Tan[c + d*x])^(7/2)) + ((9*I)/40)/(d*(
a + I*a*Tan[c + d*x])^(5/2)) + ((3*I)/16)/(a*d*(a + I*a*Tan[c + d*x])^(3/2)
) + ((9*I)/32)/(a^2*d*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
```

```
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^2(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx = -\frac{(ia^3)\,\text{Subst}\left(\int \frac{1}{(a-x)^2(a+x)^{9/2}}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{7/2}} - \frac{(9ia^2)\,\text{Subst}\left(\int \frac{1}{(a-x)(a+x)^{9/2}}\,dx\right.}{4d}$$

$$= \frac{9ia}{28d(a+ia\tan(c+dx))^{7/2}} - \frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{7/2}} - \frac{(9i}{}$$

$$= \frac{9ia}{28d(a+ia\tan(c+dx))^{7/2}} - \frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{7/2}} + \frac{}{40}$$

$$= \frac{9ia}{28d(a+ia\tan(c+dx))^{7/2}} - \frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{7/2}} + \frac{}{40}$$

$$= \frac{9ia}{28d(a+ia\tan(c+dx))^{7/2}} - \frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{7/2}} + \frac{}{40}$$

$$= \frac{9ia}{28d(a+ia\tan(c+dx))^{7/2}} - \frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{7/2}} + \frac{}{40}$$

$$= -\frac{9i\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{32\sqrt{2}a^{5/2}d} + \frac{9ia}{28d(a+ia\tan(c+dx))^{7/2}} - \frac{}{2d(a-ia\tan(c+d}$$

Mathematica [A] time = 1.25, size = 163, normalized size = 0.80

$$-\frac{ie^{-8i(c+dx)}\left(1+e^{2i(c+dx)}\right)^{3/2}\sec^2(c+dx)\left(\sqrt{1+e^{2i(c+dx)}}\left(-58e^{2i(c+dx)}-156e^{4i(c+dx)}-388e^{6i(c+dx)}+35e^{8i(c+dx)}-\right.\right.}{4480a^2d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((-1/4480*I)*(1 + E^((2*I)*(c + d*x)))^(3/2)*(Sqrt[1 + E^((2*I)*(c + d*x))]
*(-10 - 58*E^((2*I)*(c + d*x)) - 156*E^((4*I)*(c + d*x)) - 388*E^((6*I)*(c
+ d*x)) + 35*E^((8*I)*(c + d*x))) + 315*E^((7*I)*(c + d*x))*ArcSinh[E^(I*(c
 + d*x))])*Sec[c + d*x]^2)/(a^2*d*E^((8*I)*(c + d*x))*Sqrt[a + I*a*Tan[c +
d*x]])
```

fricas [B] time = 0.75, size = 305, normalized size = 1.50

$$\left(-315i\sqrt{\frac{1}{2}}a^3d\sqrt{\frac{1}{a^5d^2}}e^{(7i\,dx+7i\,c)}\log\left(4\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(a^3de^{(2i\,dx+2i\,c)}+a^3d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{a^5d^2}}+ae^{(i\,dx+i\,c)}\right)e^{(-i\,dx-i\,c)}\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/2240*(-315*I*sqrt(1/2)*a^3*d*sqrt(1/(a^5*d^2))*e^(7*I*d*x + 7*I*c)*log(4*
(sqrt(2)*sqrt(1/2)*(a^3*d*e^(2*I*d*x + 2*I*c) + a^3*d)*sqrt(a/(e^(2*I*d*x +
```

```
2*I*c) + 1))*sqrt(1/(a^5*d^2)) + a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) + 31
5*I*sqrt(1/2)*a^3*d*sqrt(1/(a^5*d^2))*e^(7*I*d*x + 7*I*c)*log(-4*(sqrt(2)*s
qrt(1/2)*(a^3*d*e^(2*I*d*x + 2*I*c) + a^3*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) +
1))*sqrt(1/(a^5*d^2)) - a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) + sqrt(2)*sqrt
(a/(e^(2*I*d*x + 2*I*c) + 1))*(-35*I*e^(10*I*d*x + 10*I*c) + 353*I*e^(8*I*d
*x + 8*I*c) + 544*I*e^(6*I*d*x + 6*I*c) + 214*I*e^(4*I*d*x + 4*I*c) + 68*I*
e^(2*I*d*x + 2*I*c) + 10*I))*e^(-7*I*d*x - 7*I*c)/(a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos(dx+c)^2}{(i\,a\tan(dx+c)+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate(cos(d*x + c)^2/(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [B] time = 1.19, size = 395, normalized size = 1.94

$$\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(2560i\left(\cos^8(dx+c)\right)+2560\sin(dx+c)\left(\cos^7(dx+c)\right)-768i\left(\cos^6(dx+c)\right)+512\left(\mathrm{co}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 1/4480/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(2560*I*cos(d*x+c)^
8+2560*sin(d*x+c)*cos(d*x+c)^7-768*I*cos(d*x+c)^6+512*cos(d*x+c)^5*sin(d*x+
c)+96*I*cos(d*x+c)^4+315*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*
(I*cos(d*x+c)-I-sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*2^(1/2))*2^(1/2)*cos(d*x+c)+315*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arc
tan(1/2*(I*cos(d*x+c)-I-sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)
))^(1/2)*2^(1/2))*2^(1/2)+672*cos(d*x+c)^3*sin(d*x+c)+315*arctan(1/2*(I*cos
(d*x+c)-I-sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/
2))*sin(d*x+c)*2^(1/2)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+420*I*cos(d*x+c
)^2+1260*cos(d*x+c)*sin(d*x+c))/a^3
```

maxima [A] time = 0.66, size = 175, normalized size = 0.86

$$\frac{i\left(\frac{4\left(315\,(i\,a\tan(dx+c)+a)^4-420\,(i\,a\tan(dx+c)+a)^3a-168\,(i\,a\tan(dx+c)+a)^2a^2-144\,(i\,a\tan(dx+c)+a)a^3-160\,a^4\right)}{(i\,a\tan(dx+c)+a)^{\frac{9}{2}}a-2\,(i\,a\tan(dx+c)+a)^{\frac{7}{2}}a^2}+\frac{315\,\sqrt{2}\log\left(-\frac{\sqrt{2}\,\sqrt{a}-\sqrt{i\,a\tan(dx+c}}{\sqrt{2}\,\sqrt{a}+\sqrt{i\,a\tan(dx+c}}\right.}{a^{\frac{3}{2}}}\right.}{4480\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] 1/4480*I*(4*(315*(I*a*tan(d*x + c) + a)^4 - 420*(I*a*tan(d*x + c) + a)^3*a
- 168*(I*a*tan(d*x + c) + a)^2*a^2 - 144*(I*a*tan(d*x + c) + a)*a^3 - 160*a
^4)/((I*a*tan(d*x + c) + a)^(9/2)*a - 2*(I*a*tan(d*x + c) + a)^(7/2)*a^2) +
 315*sqrt(2)*log(-(sqrt(2)*sqrt(a) - sqrt(I*a*tan(d*x + c) + a))/(sqrt(2)*s
qrt(a) + sqrt(I*a*tan(d*x + c) + a)))/a^(3/2))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\cos(c+d\,x)^2}{(a+a\tan(c+d\,x)\,1\mathrm{i})^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2/(a + a*tan(c + d*x)*1i)^(5/2),x)
```

```
[Out] int(cos(c + d*x)^2/(a + a*tan(c + d*x)*1i)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos^2(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Integral(cos(c + d*x)**2/(I*a*(tan(c + d*x) - I))**(5/2), x)
```

3.368 $\int \frac{\cos^4(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=277

$$-\frac{143i\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{512\sqrt{2}\,a^{5/2}d}-\frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{9/2}}-\frac{13ia^3}{16d(a-ia\tan(c+dx))(a+ia\tan(}$$

```
[Out] -143/1024*I*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))/a^(5/2)/d
*2^(1/2)+143/512*I/a^2/d/(a+I*a*tan(d*x+c))^(1/2)+143/288*I*a^2/d/(a+I*a*ta
n(d*x+c))^(9/2)-1/4*I*a^4/d/(a-I*a*tan(d*x+c))^2/(a+I*a*tan(d*x+c))^(9/2)-1
3/16*I*a^3/d/(a-I*a*tan(d*x+c))/(a+I*a*tan(d*x+c))^(9/2)+143/448*I*a/d/(a+I
*a*tan(d*x+c))^(7/2)+143/640*I/d/(a+I*a*tan(d*x+c))^(5/2)+143/768*I/a/d/(a+
I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.16, antiderivative size = 277, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {3487, 51, 63, 206}

$$-\frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{9/2}}-\frac{13ia^3}{16d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{9/2}}+\frac{143ia^2}{288d(a+ia\tan(c}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((-143*I)/512)*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a])])/(Sqr
t[2]*a^(5/2)*d) + (((143*I)/288)*a^2)/(d*(a + I*a*Tan[c + d*x])^(9/2)) - ((
I/4)*a^4)/(d*(a - I*a*Tan[c + d*x])^2*(a + I*a*Tan[c + d*x])^(9/2)) - (((13
*I)/16)*a^3)/(d*(a - I*a*Tan[c + d*x])*(a + I*a*Tan[c + d*x])^(9/2)) + (((1
43*I)/448)*a)/(d*(a + I*a*Tan[c + d*x])^(7/2)) + ((143*I)/640)/(d*(a + I*a*
Tan[c + d*x])^(5/2)) + ((143*I)/768)/(a*d*(a + I*a*Tan[c + d*x])^(3/2)) + (
(143*I)/512)/(a^2*d*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^4(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx = -\frac{\left(ia^5\right)\text{Subst}\left(\int \frac{1}{(a-x)^3(a+x)^{11/2}}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{9/2}} - \frac{\left(13ia^4\right)\text{Subst}\left(\int \frac{1}{(a-x)^2(a+x)^{11/2}}\right.}{8d}$$

$$= -\frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{9/2}} - \frac{13ia^3}{16d(a-ia\tan(c+dx))(a+ia}$$

$$= \frac{143ia^2}{288d(a+ia\tan(c+dx))^{9/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{9/2}} - \frac{}{1}$$

$$= \frac{143ia^2}{288d(a+ia\tan(c+dx))^{9/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{9/2}} - \frac{}{1}$$

$$= \frac{143ia^2}{288d(a+ia\tan(c+dx))^{9/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{9/2}} - \frac{}{1}$$

$$= \frac{143ia^2}{288d(a+ia\tan(c+dx))^{9/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{9/2}} - \frac{}{1}$$

$$= \frac{143ia^2}{288d(a+ia\tan(c+dx))^{9/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{9/2}} - \frac{}{1}$$

$$= \frac{143ia^2}{288d(a+ia\tan(c+dx))^{9/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{9/2}} - \frac{}{1}$$

$$= -\frac{143i\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{512\sqrt{2}a^{5/2}d} + \frac{143ia^2}{288d(a+ia\tan(c+dx))^{9/2}} - \frac{}{4d(a-ia\tan(c}$$

Mathematica [A] time = 1.71, size = 189, normalized size = 0.68

$$-\frac{ie^{-10i(c+dx)}\left(1+e^{2i(c+dx)}\right)^{3/2}\sec^2(c+dx)\left(\sqrt{1+e^{2i(c+dx)}}\left(-2200e^{2i(c+dx)}-7944e^{4i(c+dx)}-18808e^{6i(c+dx)}-5058\right.\right.}{645120a^2d\sqrt{a+ia\tan(c+d}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((-1/645120*I)*(1 + E^((2*I)*(c + d*x)))^(3/2)*(Sqrt[1 + E^((2*I)*(c + d*x)
)]*(-280 - 2200*E^((2*I)*(c + d*x)) - 7944*E^((4*I)*(c + d*x)) - 18808*E^((
6*I)*(c + d*x)) - 50584*E^((8*I)*(c + d*x)) + 7875*E^((10*I)*(c + d*x)) + 6
30*E^((12*I)*(c + d*x))) + 45045*E^((9*I)*(c + d*x))*ArcSinh[E^(I*(c + d*x)
)])*Sec[c + d*x]^2)/(a^2*d*E^((10*I)*(c + d*x))*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.86, size = 327, normalized size = 1.18

$$\left(-45045i\sqrt{\frac{1}{2}}a^3d\sqrt{\frac{1}{a^5d^2}}e^{(9idx+9ic)}\log\left(4\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(a^3de^{(2idx+2ic)}+a^3d\right)\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\sqrt{\frac{1}{a^5d^2}}+ae^{(idx+ic)}\right)e^{(-idx-i}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/322560*(-45045*I*sqrt(1/2)*a^3*d*sqrt(1/(a^5*d^2))*e^(9*I*d*x + 9*I*c)*lo
g(4*(sqrt(2)*sqrt(1/2)*(a^3*d*e^(2*I*d*x + 2*I*c) + a^3*d)*sqrt(a/(e^(2*I*d
*x + 2*I*c) + 1))*sqrt(1/(a^5*d^2)) + a*e^(I*d*x + I*c))*e^(-I*d*x - I*c))
+ 45045*I*sqrt(1/2)*a^3*d*sqrt(1/(a^5*d^2))*e^(9*I*d*x + 9*I*c)*log(-4*(sqr
t(2)*sqrt(1/2)*(a^3*d*e^(2*I*d*x + 2*I*c) + a^3*d)*sqrt(a/(e^(2*I*d*x + 2*I
*c) + 1))*sqrt(1/(a^5*d^2)) - a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) + sqrt(2
)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-630*I*e^(14*I*d*x + 14*I*c) - 8505*I*
e^(12*I*d*x + 12*I*c) + 42709*I*e^(10*I*d*x + 10*I*c) + 69392*I*e^(8*I*d*x
+ 8*I*c) + 26752*I*e^(6*I*d*x + 6*I*c) + 10144*I*e^(4*I*d*x + 4*I*c) + 2480
*I*e^(2*I*d*x + 2*I*c) + 280*I))*e^(-9*I*d*x - 9*I*c)/(a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos(dx+c)^4}{(i\,a\tan(dx+c)+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate(cos(d*x + c)^4/(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [A] time = 1.37, size = 422, normalized size = 1.52

$$\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(286720i\left(\cos^{10}(dx+c)\right)+286720\sin(dx+c)\left(\cos^{9}(dx+c)\right)-81920i\left(\cos^{8}(dx+c)\right)+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 1/645120/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(286720*I*cos(d*x
+c)^10+286720*sin(d*x+c)*cos(d*x+c)^9-81920*I*cos(d*x+c)^8+61440*sin(d*x+c)
*cos(d*x+c)^7+6656*I*cos(d*x+c)^6+73216*cos(d*x+c)^5*sin(d*x+c)+13728*I*cos
(d*x+c)^4+45045*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)*arctan(1/
2*(I*cos(d*x+c)-I-sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/
2)*2^(1/2))*2^(1/2)+45045*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)*ar
ctan(1/2*(I*cos(d*x+c)-I-sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c
)))^(1/2)*2^(1/2))+96096*cos(d*x+c)^3*sin(d*x+c)+45045*arctan(1/2*(I*cos(d*
x+c)-I-sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))
*sin(d*x+c)*2^(1/2)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+60060*I*cos(d*x+c)
^2+180180*cos(d*x+c)*sin(d*x+c))/a^3
```

maxima [A] time = 0.56, size = 229, normalized size = 0.83

$$\frac{i\left(\frac{4\left(45045\,(i\,a\tan(dx+c)+a)^{6}-150150\,(i\,a\tan(dx+c)+a)^{5}a+96096\,(i\,a\tan(dx+c)+a)^{4}a^{2}+27456\,(i\,a\tan(dx+c)+a)^{3}a^{3}+18304\,(i\,a\tan(dx+c)+a)^{2}a^{4}+166\right.}{(i\,a\tan(dx+c)+a)^{\frac{13}{2}}a-4\,(i\,a\tan(dx+c)+a)^{\frac{11}{2}}a^{2}+4\,(i\,a\tan(dx+c)+a)^{\frac{9}{2}}a^{3}}\right.}{645120\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] 1/645120*I*(4*(45045*(I*a*tan(d*x + c) + a)^6 - 150150*(I*a*tan(d*x + c) +
a)^5*a + 96096*(I*a*tan(d*x + c) + a)^4*a^2 + 27456*(I*a*tan(d*x + c) + a)^
```

```
3*a^3 + 18304*(I*a*tan(d*x + c) + a)^2*a^4 + 16640*(I*a*tan(d*x + c) + a)*a
^5 + 17920*a^6)/((I*a*tan(d*x + c) + a)^(13/2)*a - 4*(I*a*tan(d*x + c) + a)
^(11/2)*a^2 + 4*(I*a*tan(d*x + c) + a)^(9/2)*a^3) + 45045*sqrt(2)*log(-(sqr
t(2)*sqrt(a) - sqrt(I*a*tan(d*x + c) + a))/(sqrt(2)*sqrt(a) + sqrt(I*a*tan(
d*x + c) + a)))/a^(3/2))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\cos(c+d\,x)^4}{(a+a\tan(c+d\,x)\,1\mathrm{i})^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4/(a + a*tan(c + d*x)*1i)^(5/2),x)
```

```
[Out] int(cos(c + d*x)^4/(a + a*tan(c + d*x)*1i)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos^4(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Integral(cos(c + d*x)**4/(I*a*(tan(c + d*x) - I))**(5/2), x)
```

3.369 $\int \frac{\sec^{13}(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=147

$$\frac{256ia^4\sec^{13}(c+dx)}{20995d(a+ia\tan(c+dx))^{13/2}}+\frac{64ia^3\sec^{13}(c+dx)}{1615d(a+ia\tan(c+dx))^{11/2}}+\frac{24ia^2\sec^{13}(c+dx)}{323d(a+ia\tan(c+dx))^{9/2}}+\frac{2ia\sec^{13}(c+dx)}{19d(a+ia\tan(c+dx))^{7/2}}$$

```
[Out] 256/20995*I*a^4*sec(d*x+c)^13/d/(a+I*a*tan(d*x+c))^(13/2)+64/1615*I*a^3*sec
(d*x+c)^13/d/(a+I*a*tan(d*x+c))^(11/2)+24/323*I*a^2*sec(d*x+c)^13/d/(a+I*a*
tan(d*x+c))^(9/2)+2/19*I*a*sec(d*x+c)^13/d/(a+I*a*tan(d*x+c))^(7/2)
```

Rubi [A] time = 0.27, antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3494, 3493}

$$\frac{24ia^2\sec^{13}(c+dx)}{323d(a+ia\tan(c+dx))^{9/2}}+\frac{64ia^3\sec^{13}(c+dx)}{1615d(a+ia\tan(c+dx))^{11/2}}+\frac{256ia^4\sec^{13}(c+dx)}{20995d(a+ia\tan(c+dx))^{13/2}}+\frac{2ia\sec^{13}(c+dx)}{19d(a+ia\tan(c+dx))^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^13/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((256*I)/20995)*a^4*Sec[c + d*x]^13)/(d*(a + I*a*Tan[c + d*x])^(13/2)) + (
((64*I)/1615)*a^3*Sec[c + d*x]^13)/(d*(a + I*a*Tan[c + d*x])^(11/2)) + (((2
4*I)/323)*a^2*Sec[c + d*x]^13)/(d*(a + I*a*Tan[c + d*x])^(9/2)) + (((2*I)/1
9)*a*Sec[c + d*x]^13)/(d*(a + I*a*Tan[c + d*x])^(7/2))
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sec^{13}(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx &= \frac{2ia\sec^{13}(c+dx)}{19d(a+ia\tan(c+dx))^{7/2}}+\frac{1}{19}(12a)\int \frac{\sec^{13}(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx \\
&= \frac{24ia^2\sec^{13}(c+dx)}{323d(a+ia\tan(c+dx))^{9/2}}+\frac{2ia\sec^{13}(c+dx)}{19d(a+ia\tan(c+dx))^{7/2}}+\frac{1}{323}\left(96a^2\right)\int \frac{\sec^{13}(c+dx)}{(a+ia\tan(c+dx))^{9/2}}\,dx \\
&= \frac{64ia^3\sec^{13}(c+dx)}{1615d(a+ia\tan(c+dx))^{11/2}}+\frac{24ia^2\sec^{13}(c+dx)}{323d(a+ia\tan(c+dx))^{9/2}}+\frac{2ia\sec^{13}(c+dx)}{19d(a+ia\tan(c+dx))^{7/2}}+\ldots \\
&= \frac{256ia^4\sec^{13}(c+dx)}{20995d(a+ia\tan(c+dx))^{13/2}}+\frac{64ia^3\sec^{13}(c+dx)}{1615d(a+ia\tan(c+dx))^{11/2}}+\frac{24ia^2\sec^{13}(c+dx)}{323d(a+ia\tan(c+dx))^{9/2}}+\ldots
\end{aligned}$$

Mathematica [A] time = 1.11, size = 112, normalized size = 0.76

$$\frac{\sec^{12}(c+dx)(13i(38\sin(c+dx)+123\sin(3(c+dx)))+798\cos(c+dx)+1631\cos(3(c+dx)))(-2\sin(4(c+dx))-\dots}{20995a^2d(\tan(c+dx)-i)^2\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^13/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (Sec[c + d*x]^12*(798*Cos[c + d*x] + 1631*Cos[3*(c + d*x)] + (13*I)*(38*Sin
[c + d*x] + 123*Sin[3*(c + d*x)]))*((-2*I)*Cos[4*(c + d*x)] - 2*Sin[4*(c +
d*x)]))/(20995*a^2*d*(-I + Tan[c + d*x])^2*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 1.68, size = 199, normalized size = 1.35

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\left(1653760ie^{(6idx+6ic)}+661504ie^{(4idx+4ic)}+1\dots\right.}{20995\left(a^3de^{(18idx+18ic)}+9a^3de^{(16idx+16ic)}+36a^3de^{(14idx+14ic)}+84a^3de^{(12idx+12ic)}+126a^3de^{(10idx+10ic)}+12\dots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^13/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/20995*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(1653760*I*e^(6*I*d*x + 6
*I*c) + 661504*I*e^(4*I*d*x + 4*I*c) + 155648*I*e^(2*I*d*x + 2*I*c) + 16384
*I)/(a^3*d*e^(18*I*d*x + 18*I*c) + 9*a^3*d*e^(16*I*d*x + 16*I*c) + 36*a^3*d
*e^(14*I*d*x + 14*I*c) + 84*a^3*d*e^(12*I*d*x + 12*I*c) + 126*a^3*d*e^(10*I
*d*x + 10*I*c) + 126*a^3*d*e^(8*I*d*x + 8*I*c) + 84*a^3*d*e^(6*I*d*x + 6*I*
c) + 36*a^3*d*e^(4*I*d*x + 4*I*c) + 9*a^3*d*e^(2*I*d*x + 2*I*c) + a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)^{13}}{(ia\tan(dx+c)+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^13/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^13/(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [A] time = 19.23, size = 181, normalized size = 1.23

$$\frac{2\left(8192i\left(\cos^{10}(dx+c)\right)+8192\sin(dx+c)\left(\cos^{9}(dx+c)\right)-1024i\left(\cos^{8}(dx+c)\right)+3072\sin(dx+c)\left(\cos^{7}(\dots\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^13/(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 2/20995/d*(8192*I*cos(d*x+c)^10+8192*sin(d*x+c)*cos(d*x+c)^9-1024*I*cos(d*x
+c)^8+3072*sin(d*x+c)*cos(d*x+c)^7-320*I*cos(d*x+c)^6+2240*cos(d*x+c)^5*sin
(d*x+c)-168*I*cos(d*x+c)^4+1848*cos(d*x+c)^3*sin(d*x+c)-5356*I*cos(d*x+c)^2
-3640*cos(d*x+c)*sin(d*x+c)+1105*I)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c)
)^(1/2)/cos(d*x+c)^9/a^3
```

maxima [B] time = 1.14, size = 902, normalized size = 6.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^13/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] -2/20995*(-2429*I*sqrt(a) - 8850*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) -
5122*I*sqrt(a)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 45190*sqrt(a)*sin(d*x
+ c)^3/(cos(d*x + c) + 1)^3 - 12924*I*sqrt(a)*sin(d*x + c)^4/(cos(d*x + c)
+ 1)^4 - 152478*sqrt(a)*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 40470*I*sqrt(
a)*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 - 397594*sqrt(a)*sin(d*x + c)^7/(cos
(d*x + c) + 1)^7 - 50065*I*sqrt(a)*sin(d*x + c)^8/(cos(d*x + c) + 1)^8 - 72
2228*sqrt(a)*sin(d*x + c)^9/(cos(d*x + c) + 1)^9 - 19380*I*sqrt(a)*sin(d*x
+ c)^10/(cos(d*x + c) + 1)^10 - 936700*sqrt(a)*sin(d*x + c)^11/(cos(d*x + c
) + 1)^11 - 936700*sqrt(a)*sin(d*x + c)^13/(cos(d*x + c) + 1)^13 + 19380*I*
sqrt(a)*sin(d*x + c)^14/(cos(d*x + c) + 1)^14 - 722228*sqrt(a)*sin(d*x + c)
^15/(cos(d*x + c) + 1)^15 + 50065*I*sqrt(a)*sin(d*x + c)^16/(cos(d*x + c) +
 1)^16 - 397594*sqrt(a)*sin(d*x + c)^17/(cos(d*x + c) + 1)^17 + 40470*I*sqr
t(a)*sin(d*x + c)^18/(cos(d*x + c) + 1)^18 - 152478*sqrt(a)*sin(d*x + c)^19
/(cos(d*x + c) + 1)^19 + 12924*I*sqrt(a)*sin(d*x + c)^20/(cos(d*x + c) + 1)
^20 - 45190*sqrt(a)*sin(d*x + c)^21/(cos(d*x + c) + 1)^21 + 5122*I*sqrt(a)*
sin(d*x + c)^22/(cos(d*x + c) + 1)^22 - 8850*sqrt(a)*sin(d*x + c)^23/(cos(d
*x + c) + 1)^23 + 2429*I*sqrt(a)*sin(d*x + c)^24/(cos(d*x + c) + 1)^24)*(si
n(d*x + c)/(cos(d*x + c) + 1) + 1)^(5/2)*(sin(d*x + c)/(cos(d*x + c) + 1) -
 1)^(5/2)/((a^3 - 12*a^3*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 66*a^3*sin(d
*x + c)^4/(cos(d*x + c) + 1)^4 - 220*a^3*sin(d*x + c)^6/(cos(d*x + c) + 1)^
6 + 495*a^3*sin(d*x + c)^8/(cos(d*x + c) + 1)^8 - 792*a^3*sin(d*x + c)^10/(
cos(d*x + c) + 1)^10 + 924*a^3*sin(d*x + c)^12/(cos(d*x + c) + 1)^12 - 792*
a^3*sin(d*x + c)^14/(cos(d*x + c) + 1)^14 + 495*a^3*sin(d*x + c)^16/(cos(d*
x + c) + 1)^16 - 220*a^3*sin(d*x + c)^18/(cos(d*x + c) + 1)^18 + 66*a^3*sin
(d*x + c)^20/(cos(d*x + c) + 1)^20 - 12*a^3*sin(d*x + c)^22/(cos(d*x + c) +
 1)^22 + a^3*sin(d*x + c)^24/(cos(d*x + c) + 1)^24)*d*(-2*I*sin(d*x + c)/(c
os(d*x + c) + 1) + sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 1)^(5/2))
```

mupad [B] time = 11.59, size = 301, normalized size = 2.05

$$\frac{e^{-c\,1i-d\,x\,1i}\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,1024i}{13\,a^3\,d\left(e^{c\,2i+d\,x\,2i}+1\right)^6}-\frac{e^{-c\,1i-d\,x\,1i}\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,1024i}{5\,a^3\,d\left(e^{c\,2i+d\,x\,2i}+1\right)^7}+\frac{e^{-c\,1i-d\,x\,1i}\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}}{17\,a^3\,d\left(e^{c\,2i+d\,x\,2i}+1\right)^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^13*(a + a*tan(c + d*x)*1i)^(5/2)),x)
```

```
[Out] (exp(- c*1i - d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i +
d*x*2i) + 1))^(1/2)*1024i)/(13*a^3*d*(exp(c*2i + d*x*2i) + 1)^6) - (exp(- c
*1i - d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i)
+ 1))^(1/2)*1024i)/(5*a^3*d*(exp(c*2i + d*x*2i) + 1)^7) + (exp(- c*1i - d*x
*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/
2)*3072i)/(17*a^3*d*(exp(c*2i + d*x*2i) + 1)^8) - (exp(- c*1i - d*x*1i)*(a
- (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*1024i
)/(19*a^3*d*(exp(c*2i + d*x*2i) + 1)^9)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**13/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.370 $\int \frac{\sec^{11}(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=110

$$\frac{64ia^3\sec^{11}(c+dx)}{2145d(a+ia\tan(c+dx))^{11/2}}+\frac{16ia^2\sec^{11}(c+dx)}{195d(a+ia\tan(c+dx))^{9/2}}+\frac{2ia\sec^{11}(c+dx)}{15d(a+ia\tan(c+dx))^{7/2}}$$

```
[Out] 64/2145*I*a^3*sec(d*x+c)^11/d/(a+I*a*tan(d*x+c))^(11/2)+16/195*I*a^2*sec(d*
x+c)^11/d/(a+I*a*tan(d*x+c))^(9/2)+2/15*I*a*sec(d*x+c)^11/d/(a+I*a*tan(d*x+
c))^(7/2)
```

Rubi [A] time = 0.19, antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3494, 3493}

$$\frac{16ia^2\sec^{11}(c+dx)}{195d(a+ia\tan(c+dx))^{9/2}}+\frac{64ia^3\sec^{11}(c+dx)}{2145d(a+ia\tan(c+dx))^{11/2}}+\frac{2ia\sec^{11}(c+dx)}{15d(a+ia\tan(c+dx))^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^11/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((64*I)/2145)*a^3*Sec[c + d*x]^11)/(d*(a + I*a*Tan[c + d*x])^(11/2)) + (((
16*I)/195)*a^2*Sec[c + d*x]^11)/(d*(a + I*a*Tan[c + d*x])^(9/2)) + (((2*I)/
15)*a*Sec[c + d*x]^11)/(d*(a + I*a*Tan[c + d*x])^(7/2))
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] && !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^{11}(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx &= \frac{2ia\sec^{11}(c+dx)}{15d(a+ia\tan(c+dx))^{7/2}}+\frac{1}{15}(8a)\int \frac{\sec^{11}(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx\\ &= \frac{16ia^2\sec^{11}(c+dx)}{195d(a+ia\tan(c+dx))^{9/2}}+\frac{2ia\sec^{11}(c+dx)}{15d(a+ia\tan(c+dx))^{7/2}}+\frac{1}{195}\left(32a^2\right)\int \frac{s}{(a+i}\\ &= \frac{64ia^3\sec^{11}(c+dx)}{2145d(a+ia\tan(c+dx))^{11/2}}+\frac{16ia^2\sec^{11}(c+dx)}{195d(a+ia\tan(c+dx))^{9/2}}+\frac{2ia\sec^{11}(c-}{15d(a+ia\tan(c}\end{aligned}$$

Mathematica [A] time = 0.76, size = 94, normalized size = 0.85

$$\frac{\sec^{10}(c+dx)(187i\sin(2(c+dx))+203\cos(2(c+dx))+60)(-2\sin(3(c+dx))-2i\cos(3(c+dx)))}{2145a^2d(\tan(c+dx)-i)^2\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^11/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (Sec[c + d*x]^10*(60 + 203*Cos[2*(c + d*x)] + (187*I)*Sin[2*(c + d*x)])*((-
2*I)*Cos[3*(c + d*x)] - 2*Sin[3*(c + d*x)]))/(2145*a^2*d*(-I + Tan[c + d*x]
)^2*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.75, size = 158, normalized size = 1.44

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(49920i\,e^{(4i\,dx+4i\,c)}+15360i\,e^{(2i\,dx+2i\,c)}+2048i\right)}{2145\left(a^3de^{(14i\,dx+14i\,c)}+7\,a^3de^{(12i\,dx+12i\,c)}+21\,a^3de^{(10i\,dx+10i\,c)}+35\,a^3de^{(8i\,dx+8i\,c)}+35\,a^3de^{(6i\,dx+6i\,c)}+21\,a^3de^{(4i\,dx+}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^11/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/2145*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(49920*I*e^(4*I*d*x + 4*I*
c) + 15360*I*e^(2*I*d*x + 2*I*c) + 2048*I)/(a^3*d*e^(14*I*d*x + 14*I*c) + 7
*a^3*d*e^(12*I*d*x + 12*I*c) + 21*a^3*d*e^(10*I*d*x + 10*I*c) + 35*a^3*d*e^
(8*I*d*x + 8*I*c) + 35*a^3*d*e^(6*I*d*x + 6*I*c) + 21*a^3*d*e^(4*I*d*x + 4*
I*c) + 7*a^3*d*e^(2*I*d*x + 2*I*c) + a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec\left(dx+c\right)^{11}}{\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^11/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^11/(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [A] time = 2.90, size = 154, normalized size = 1.40

$$\frac{2\left(1024i\left(\cos^{8}\left(dx+c\right)\right)+1024\sin\left(dx+c\right)\left(\cos^{7}\left(dx+c\right)\right)-128i\left(\cos^{6}\left(dx+c\right)\right)+384\left(\cos^{5}\left(dx+c\right)\right)\sin\left(dx+\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^11/(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 2/2145/d*(1024*I*cos(d*x+c)^8+1024*sin(d*x+c)*cos(d*x+c)^7-128*I*cos(d*x+c)
^6+384*cos(d*x+c)^5*sin(d*x+c)-40*I*cos(d*x+c)^4+280*cos(d*x+c)^3*sin(d*x+c
)-736*I*cos(d*x+c)^2-484*cos(d*x+c)*sin(d*x+c)+143*I)*(a*(I*sin(d*x+c)+cos(
d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^7/a^3
```

maxima [B] time = 1.02, size = 764, normalized size = 6.95

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^11/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] -2/2145*(-263*I*sqrt(a) - 830*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) - 760
*I*sqrt(a)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 4270*sqrt(a)*sin(d*x + c)^
3/(cos(d*x + c) + 1)^3 - 1085*I*sqrt(a)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4
 - 11576*sqrt(a)*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 2000*I*sqrt(a)*sin(d
```

```
*x + c)^6/(cos(d*x + c) + 1)^6 - 23000*sqrt(a)*sin(d*x + c)^7/(cos(d*x + c)
 + 1)^7 - 2470*I*sqrt(a)*sin(d*x + c)^8/(cos(d*x + c) + 1)^8 - 33540*sqrt(a
)*sin(d*x + c)^9/(cos(d*x + c) + 1)^9 - 33540*sqrt(a)*sin(d*x + c)^11/(cos(
d*x + c) + 1)^11 + 2470*I*sqrt(a)*sin(d*x + c)^12/(cos(d*x + c) + 1)^12 - 2
3000*sqrt(a)*sin(d*x + c)^13/(cos(d*x + c) + 1)^13 + 2000*I*sqrt(a)*sin(d*x
 + c)^14/(cos(d*x + c) + 1)^14 - 11576*sqrt(a)*sin(d*x + c)^15/(cos(d*x + c
) + 1)^15 + 1085*I*sqrt(a)*sin(d*x + c)^16/(cos(d*x + c) + 1)^16 - 4270*sqr
t(a)*sin(d*x + c)^17/(cos(d*x + c) + 1)^17 + 760*I*sqrt(a)*sin(d*x + c)^18/
(cos(d*x + c) + 1)^18 - 830*sqrt(a)*sin(d*x + c)^19/(cos(d*x + c) + 1)^19 +
 263*I*sqrt(a)*sin(d*x + c)^20/(cos(d*x + c) + 1)^20)*(sin(d*x + c)/(cos(d*
x + c) + 1) + 1)^(5/2)*(sin(d*x + c)/(cos(d*x + c) + 1) - 1)^(5/2)/((a^3 -
10*a^3*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 45*a^3*sin(d*x + c)^4/(cos(d*x
 + c) + 1)^4 - 120*a^3*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 + 210*a^3*sin(d*
x + c)^8/(cos(d*x + c) + 1)^8 - 252*a^3*sin(d*x + c)^10/(cos(d*x + c) + 1)^
10 + 210*a^3*sin(d*x + c)^12/(cos(d*x + c) + 1)^12 - 120*a^3*sin(d*x + c)^1
4/(cos(d*x + c) + 1)^14 + 45*a^3*sin(d*x + c)^16/(cos(d*x + c) + 1)^16 - 10
*a^3*sin(d*x + c)^18/(cos(d*x + c) + 1)^18 + a^3*sin(d*x + c)^20/(cos(d*x +
 c) + 1)^20)*d*(-2*I*sin(d*x + c)/(cos(d*x + c) + 1) + sin(d*x + c)^2/(cos(
d*x + c) + 1)^2 - 1)^(5/2))
```

mupad [B] time = 8.75, size = 105, normalized size = 0.95

$$\frac{256\,\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\,\sqrt{a-\frac{a\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)\,1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,60\mathrm{i}+\mathrm{e}^{c\,4\mathrm{i}+d\,x\,4\mathrm{i}}\,195\mathrm{i}+8\mathrm{i}\right)}{2145\,a^3\,d\,{\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^11*(a + a*tan(c + d*x)*1i)^(5/2)),x)
```

```
[Out] (256*exp(- c*1i - d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2
i + d*x*2i) + 1))^(1/2)*(exp(c*2i + d*x*2i)*60i + exp(c*4i + d*x*4i)*195i +
 8i))/(2145*a^3*d*(exp(c*2i + d*x*2i) + 1)^7)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**11/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.371 $\int \frac{\sec^9(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=73

$$\frac{8ia^2\sec^9(c+dx)}{99d(a+ia\tan(c+dx))^{9/2}}+\frac{2ia\sec^9(c+dx)}{11d(a+ia\tan(c+dx))^{7/2}}$$

```
[Out] 8/99*I*a^2*sec(d*x+c)^9/d/(a+I*a*tan(d*x+c))^(9/2)+2/11*I*a*sec(d*x+c)^9/d/
(a+I*a*tan(d*x+c))^(7/2)
```

Rubi [A] time = 0.13, antiderivative size = 73, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3494, 3493}

$$\frac{8ia^2\sec^9(c+dx)}{99d(a+ia\tan(c+dx))^{9/2}}+\frac{2ia\sec^9(c+dx)}{11d(a+ia\tan(c+dx))^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^9/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((8*I)/99)*a^2*Sec[c + d*x]^9)/(d*(a + I*a*Tan[c + d*x])^(9/2)) + (((2*I)/
11)*a*Sec[c + d*x]^9)/(d*(a + I*a*Tan[c + d*x])^(7/2))
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^9(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx &= \frac{2ia\sec^9(c+dx)}{11d(a+ia\tan(c+dx))^{7/2}}+\frac{1}{11}(4a)\int \frac{\sec^9(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx\\ &= \frac{8ia^2\sec^9(c+dx)}{99d(a+ia\tan(c+dx))^{9/2}}+\frac{2ia\sec^9(c+dx)}{11d(a+ia\tan(c+dx))^{7/2}}\end{aligned}$$

Mathematica [A] time = 0.56, size = 80, normalized size = 1.10

$$\frac{2(9\tan(c+dx)-13i)\sec^7(c+dx)(\cos(2(c+dx))-i\sin(2(c+dx)))}{99a^2d(\tan(c+dx)-i)^2\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^9/(a + I*a*Tan[c + d*x])^(5/2),x]
```

[Out] (2*Sec[c + d*x]^7*(Cos[2*(c + d*x)] - I*Sin[2*(c + d*x)])*(-13*I + 9*Tan[c + d*x]))/(99*a^2*d*(-I + Tan[c + d*x])^2*Sqrt[a + I*a*Tan[c + d*x]])

fricas [B] time = 0.72, size = 117, normalized size = 1.60

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(704i\,e^{(2i\,dx+2i\,c)}+128i\right)}{99\left(a^3de^{(10i\,dx+10i\,c)}+5\,a^3de^{(8i\,dx+8i\,c)}+10\,a^3de^{(6i\,dx+6i\,c)}+10\,a^3de^{(4i\,dx+4i\,c)}+5\,a^3de^{(2i\,dx+2i\,c)}+a^3d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")

[Out] 1/99*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(704*I*e^(2*I*d*x + 2*I*c) + 128*I)/(a^3*d*e^(10*I*d*x + 10*I*c) + 5*a^3*d*e^(8*I*d*x + 8*I*c) + 10*a^3*d*e^(6*I*d*x + 6*I*c) + 10*a^3*d*e^(4*I*d*x + 4*I*c) + 5*a^3*d*e^(2*I*d*x + 2*I*c) + a^3*d)

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)^9}{(i\,a\tan(dx+c)+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")

[Out] integrate(sec(d*x + c)^9/(I*a*tan(d*x + c) + a)^(5/2), x)

maple [B] time = 1.45, size = 127, normalized size = 1.74

$$\frac{2\left(64i\left(\cos^6(dx+c)\right)+64\left(\cos^5(dx+c)\right)\sin(dx+c)-8i\left(\cos^4(dx+c)\right)+24\left(\cos^3(dx+c)\right)\sin(dx+c)-5}{99d\cos(dx+c)^5a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^(5/2),x)

[Out] 2/99/d*(64*I*cos(d*x+c)^6+64*cos(d*x+c)^5*sin(d*x+c)-8*I*cos(d*x+c)^4+24*cos(d*x+c)^3*sin(d*x+c)-52*I*cos(d*x+c)^2-32*cos(d*x+c)*sin(d*x+c)+9*I)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^5/a^3

maxima [B] time = 0.92, size = 626, normalized size = 8.58

$$-\frac{2\left(-13i\sqrt{a}-\frac{34\sqrt{a}\sin(dx+c)}{\cos(dx+c)+1}-\frac{46i\sqrt{a}\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-\frac{174\sqrt{a}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}-\frac{54i\sqrt{a}\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{394\sqrt{a}\sin(dx+c)^5}{(\cos(dx+c)+1)^5}-\frac{22i\sqrt{a}\sin(dx}{(\cos(dx+c)+}}{99\left(a^3-\frac{8a^3\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{28a^3\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")

[Out] -2/99*(-13*I*sqrt(a) - 34*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) - 46*I*sqrt(a)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 174*sqrt(a)*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 - 54*I*sqrt(a)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 394*sqrt(a)*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 22*I*sqrt(a)*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 - 550*sqrt(a)*sin(d*x + c)^7/(cos(d*x + c) + 1)^7 - 550*sqrt(a)*sin(d*x + c)^9/(cos(d*x + c) + 1)^9 + 22*I*sqrt(a)*sin(d*x + c)^10/(cos(d*x + c) + 1)^10 - 394*sqrt(a)*sin(d*x + c)^11/(cos(d*x + c) + 1)^11 +

```
54*I*sqrt(a)*sin(d*x + c)^12/(cos(d*x + c) + 1)^12 - 174*sqrt(a)*sin(d*x +
c)^13/(cos(d*x + c) + 1)^13 + 46*I*sqrt(a)*sin(d*x + c)^14/(cos(d*x + c) +
1)^14 - 34*sqrt(a)*sin(d*x + c)^15/(cos(d*x + c) + 1)^15 + 13*I*sqrt(a)*si
n(d*x + c)^16/(cos(d*x + c) + 1)^16)*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^
(5/2)*(sin(d*x + c)/(cos(d*x + c) + 1) - 1)^(5/2)/((a^3 - 8*a^3*sin(d*x + c
)^2/(cos(d*x + c) + 1)^2 + 28*a^3*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 56*
a^3*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 + 70*a^3*sin(d*x + c)^8/(cos(d*x +
c) + 1)^8 - 56*a^3*sin(d*x + c)^10/(cos(d*x + c) + 1)^10 + 28*a^3*sin(d*x +
c)^12/(cos(d*x + c) + 1)^12 - 8*a^3*sin(d*x + c)^14/(cos(d*x + c) + 1)^14
+ a^3*sin(d*x + c)^16/(cos(d*x + c) + 1)^16)*d*(-2*I*sin(d*x + c)/(cos(d*x
+ c) + 1) + sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 1)^(5/2))
```

mupad [B] time = 6.38, size = 91, normalized size = 1.25

$$\frac{64\,\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,11\mathrm{i}+2\mathrm{i}\right)\,\sqrt{a-\frac{a\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)\,1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}}{99\,a^3\,d\,{\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^9*(a + a*tan(c + d*x)*1i)^(5/2)),x)
```

```
[Out] (64*exp(- c*1i - d*x*1i)*(exp(c*2i + d*x*2i)*11i + 2i)*(a - (a*(exp(c*2i +
d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2))/(99*a^3*d*(exp(c*2i +
d*x*2i) + 1)^5)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^{9}{\left(c + dx \right)}}{\left(ia \left(\tan{\left(c + dx \right)} - i\right)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**9/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Integral(sec(c + d*x)**9/(I*a*(tan(c + d*x) - I))**(5/2), x)
```

3.372 $\int \frac{\sec^7(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=35

$$\frac{2ia\sec^7(c+dx)}{7d(a+ia\tan(c+dx))^{7/2}}$$

```
[Out] 2/7*I*a*sec(d*x+c)^7/d/(a+I*a*tan(d*x+c))^(7/2)
```

Rubi [A] time = 0.06, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.038$, Rules used = {3493}

$$\frac{2ia\sec^7(c+dx)}{7d(a+ia\tan(c+dx))^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^7/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((2*I)/7)*a*Sec[c + d*x]^7)/(d*(a + I*a*Tan[c + d*x])^(7/2))
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rubi steps

$$\int \frac{\sec^7(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx = \frac{2ia\sec^7(c+dx)}{7d(a+ia\tan(c+dx))^{7/2}}$$

Mathematica [A] time = 0.46, size = 57, normalized size = 1.63

$$-\frac{2(\tan(c+dx)+i)\sec^5(c+dx)}{7a^2d(\tan(c+dx)-i)^2\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^7/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (-2*Sec[c + d*x]^5*(I + Tan[c + d*x]))/(7*a^2*d*(-I + Tan[c + d*x])^2*Sqrt[
a + I*a*Tan[c + d*x]])
```

fricas [B] time = 0.51, size = 74, normalized size = 2.11

$$\frac{16i\sqrt{2}\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}}{7\left(a^3de^{(6idx+6ic)}+3a^3de^{(4idx+4ic)}+3a^3de^{(2idx+2ic)}+a^3d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 16/7*I*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))/(a^3*d*e^(6*I*d*x + 6*I*c)
 + 3*a^3*d*e^(4*I*d*x + 4*I*c) + 3*a^3*d*e^(2*I*d*x + 2*I*c) + a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)^7}{(ia\tan(dx+c)+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^7/(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [B] time = 1.17, size = 100, normalized size = 2.86

$$\frac{2\left(8i\left(\cos^4(dx+c)\right)+8\left(\cos^3(dx+c)\right)\sin(dx+c)-8i\left(\cos^2(dx+c)\right)-4\cos(dx+c)\sin(dx+c)+i\right)\sqrt{\frac{a(i\sin(}{}}}{7d\cos(dx+c)^3a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 2/7/d*(8*I*cos(d*x+c)^4+8*cos(d*x+c)^3*sin(d*x+c)-8*I*cos(d*x+c)^2-4*cos(d*
x+c)*sin(d*x+c)+I)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c
)^3/a^3
```

maxima [B] time = 1.00, size = 488, normalized size = 13.94

$$-\frac{2\left(-i\sqrt{a}-\frac{2\sqrt{a}\sin(dx+c)}{\cos(dx+c)+1}-\frac{4i\sqrt{a}\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-\frac{10\sqrt{a}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}-\frac{5i\sqrt{a}\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{20\sqrt{a}\sin(dx+c)^5}{(\cos(dx+c)+1)^5}-\frac{20\sqrt{a}\sin(dx+c)^7}{(\cos(dx+c)+1)^7}+\frac{5i\sqrt{}}{(\cos}\right.}{7\left(a^3-\frac{6a^3\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{15a^3\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{20a^3\sin(dx+c)^6}{(\cos(dx+c)+1)^6}+\frac{15a^3\sin(dx+c)^8}{(\cos(dx+c)+1)^8}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] -2/7*(-I*sqrt(a) - 2*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) - 4*I*sqrt(a)*
sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 10*sqrt(a)*sin(d*x + c)^3/(cos(d*x +
c) + 1)^3 - 5*I*sqrt(a)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 20*sqrt(a)*si
n(d*x + c)^5/(cos(d*x + c) + 1)^5 - 20*sqrt(a)*sin(d*x + c)^7/(cos(d*x + c)
 + 1)^7 + 5*I*sqrt(a)*sin(d*x + c)^8/(cos(d*x + c) + 1)^8 - 10*sqrt(a)*sin(
d*x + c)^9/(cos(d*x + c) + 1)^9 + 4*I*sqrt(a)*sin(d*x + c)^10/(cos(d*x + c)
 + 1)^10 - 2*sqrt(a)*sin(d*x + c)^11/(cos(d*x + c) + 1)^11 + I*sqrt(a)*sin(
d*x + c)^12/(cos(d*x + c) + 1)^12)*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(5
/2)*(sin(d*x + c)/(cos(d*x + c) + 1) - 1)^(5/2)/((a^3 - 6*a^3*sin(d*x + c)^
2/(cos(d*x + c) + 1)^2 + 15*a^3*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 20*a^
3*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 + 15*a^3*sin(d*x + c)^8/(cos(d*x + c)
 + 1)^8 - 6*a^3*sin(d*x + c)^10/(cos(d*x + c) + 1)^10 + a^3*sin(d*x + c)^12
/(cos(d*x + c) + 1)^12)*d*(-2*I*sin(d*x + c)/(cos(d*x + c) + 1) + sin(d*x +
 c)^2/(cos(d*x + c) + 1)^2 - 1)^(5/2))
```

mupad [B] time = 2.02, size = 50, normalized size = 1.43

$$\frac{e^{-c\,4i-d\,x\,4i}\,\sqrt{a+\frac{a\,\sin(c+d\,x)\,1i}{\cos(c+d\,x)}}\,2i}{7\,a^3\,d\,\cos(c+d\,x)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^7*(a + a*tan(c + d*x)*1i)^(5/2)),x)
```

```
[Out] (exp(- c*4i - d*x*4i)*(a + (a*sin(c + d*x)*1i)/cos(c + d*x))^(1/2)*2i)/(7*a
^3*d*cos(c + d*x)^3)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^7(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**7/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Integral(sec(c + d*x)**7/(I*a*(tan(c + d*x) - I))**(5/2), x)
```

3.373 $\int \frac{\sec^5(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=123

$$\frac{4i\sqrt{2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{a^{5/2}d}-\frac{4i\sec(c+dx)}{a^2d\sqrt{a+ia\tan(c+dx)}}-\frac{2i\sec^3(c+dx)}{3ad(a+ia\tan(c+dx))^{3/2}}$$

```
[Out] 4*I*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2))*2^(1/2
)/a^(5/2)/d-4*I*sec(d*x+c)/a^2/d/(a+I*a*tan(d*x+c))^(1/2)-2/3*I*sec(d*x+c)^
3/a/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.17, antiderivative size = 123, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.115, Rules used = {3491, 3489, 206}

$$-\frac{4i\sec(c+dx)}{a^2d\sqrt{a+ia\tan(c+dx)}}+\frac{4i\sqrt{2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{a^{5/2}d}-\frac{2i\sec^3(c+dx)}{3ad(a+ia\tan(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^5/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((4*I)*Sqrt[2]*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[c +
 d*x]])])/(a^(5/2)*d) - (((2*I)/3)*Sec[c + d*x]^3)/(a*d*(a + I*a*Tan[c + d*
x])^(3/2)) - ((4*I)*Sec[c + d*x])/(a^2*d*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3491

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e
+ f*x])^(n + 1))/(b*f*(m - 2)), x] + Dist[(2*d^2)/a, Int[(d*Sec[e + f*x])^(
m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f}, x] &&
 EqQ[a^2 + b^2, 0] && EqQ[m/2 + n, 0] && LtQ[n, -1]
```

Rubi steps

$$\int \frac{\sec^5(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx = -\frac{2i\sec^3(c+dx)}{3ad(a+ia\tan(c+dx))^{3/2}} + \frac{2\int \frac{\sec^3(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx}{a}$$

$$= -\frac{2i\sec^3(c+dx)}{3ad(a+ia\tan(c+dx))^{3/2}} - \frac{4i\sec(c+dx)}{a^2d\sqrt{a+ia\tan(c+dx)}} + \frac{4\int \frac{\sec(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx}{a^2}$$

$$= -\frac{2i\sec^3(c+dx)}{3ad(a+ia\tan(c+dx))^{3/2}} - \frac{4i\sec(c+dx)}{a^2d\sqrt{a+ia\tan(c+dx)}} + \frac{(8i)\,\text{Subst}\left(\int \frac{1}{2-ax^2}\,dx\right.}{a^2d}$$

$$= \frac{4i\sqrt{2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{a^{5/2}d} - \frac{2i\sec^3(c+dx)}{3ad(a+ia\tan(c+dx))^{3/2}} - \frac{4i\sec(c+}{a^2d\sqrt{a+ia\tan}}$$

Mathematica [A] time = 0.87, size = 82, normalized size = 0.67

$$-\frac{2\sec(c+dx)\left(\tan(c+dx)-6i\sqrt{1+e^{2i(c+dx)}}\tanh^{-1}\left(\sqrt{1+e^{2i(c+dx)}}\right)+7i\right)}{3a^2d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^5/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (-2*Sec[c + d*x]*(7*I - (6*I)*Sqrt[1 + E^((2*I)*(c + d*x))]*ArcTanh[Sqrt[1
+ E^((2*I)*(c + d*x))]] + Tan[c + d*x]))/(3*a^2*d*Sqrt[a + I*a*Tan[c + d*x]
])
```

fricas [B] time = 0.52, size = 267, normalized size = 2.17

$$\frac{\sqrt{2}\left(6i\,a^3de^{(2i\,dx+2i\,c)}+6i\,a^3d\right)\sqrt{\frac{1}{a^5d^2}}\log\left(\frac{\left(2\left(8i\,a^2de^{(2i\,dx+2i\,c)}+8i\,a^2d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{a^5d^2}}+16i\right)e^{(-i\,dx-i\,c)}}{a^2d}\right)+\sqrt{2}\left(-6i\,a^3de^{(\cdots}\right.}{3\left(a^3\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/3*(sqrt(2)*(6*I*a^3*d*e^(2*I*d*x + 2*I*c) + 6*I*a^3*d)*sqrt(1/(a^5*d^2))*
log((2*(8*I*a^2*d*e^(2*I*d*x + 2*I*c) + 8*I*a^2*d)*sqrt(a/(e^(2*I*d*x + 2*I
*c) + 1))*sqrt(1/(a^5*d^2)) + 16*I)*e^(-I*d*x - I*c)/(a^2*d)) + sqrt(2)*(-6
*I*a^3*d*e^(2*I*d*x + 2*I*c) - 6*I*a^3*d)*sqrt(1/(a^5*d^2))*log((2*(-8*I*a^
2*d*e^(2*I*d*x + 2*I*c) - 8*I*a^2*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt
(1/(a^5*d^2)) + 16*I)*e^(-I*d*x - I*c)/(a^2*d)) + sqrt(2)*sqrt(a/(e^(2*I*d*
x + 2*I*c) + 1))*(-12*I*e^(2*I*d*x + 2*I*c) - 16*I))/(a^3*d*e^(2*I*d*x + 2*
I*c) + a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)^5}{(i\,a\tan(dx+c)+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^5/(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [B] time = 1.21, size = 281, normalized size = 2.28

$$2\left(3\cos\left(dx+c\right)\sin\left(dx+c\right)\arctan\left(\frac{\left(i\cos(dx+c)-i+\sin(dx+c)\right)\sqrt{2}}{2\sin(dx+c)\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}}\right)\left(-\frac{2\cos(dx+c)}{1+\cos(dx+c)}\right)^{\frac{3}{2}}\sqrt{2}+3\sqrt{2}\,\arctan\left(\frac{\left(i\cos(dx+c)-i+\sin(\right.}{2\sin(dx+c)\sqrt{-\frac{2c}{1+c}}}\right.\right.$$
$$\overline{3d\left(i\sin\left(\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 2/3/d*(3*cos(d*x+c)*sin(d*x+c)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d
*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(d
*x+c)))^(3/2)*2^(1/2)+3*2^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(
d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*(-2*cos(d*x+c)/(1+cos(
d*x+c)))^(3/2)*sin(d*x+c)+8*I*cos(d*x+c)^2+8*cos(d*x+c)*sin(d*x+c)-7*I*cos(
d*x+c)-sin(d*x+c)-I)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/(I*sin(
d*x+c)+cos(d*x+c)-1)/cos(d*x+c)/a^3
```

maxima [B] time = 1.21, size = 1070, normalized size = 8.70

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] -1/3*((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1
/4)*((12*I*sqrt(2)*cos(2*d*x + 2*c) - 12*sqrt(2)*sin(2*d*x + 2*c) + 16*I*sq
rt(2))*cos(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 4*(3*sqrt
(2)*cos(2*d*x + 2*c) + 3*I*sqrt(2)*sin(2*d*x + 2*c) + 4*sqrt(2))*sin(3/2*ar
ctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)))*sqrt(a) + (6*(sqrt(2)*cos(2
*d*x + 2*c)^2 + sqrt(2)*sin(2*d*x + 2*c)^2 + 2*sqrt(2)*cos(2*d*x + 2*c) + s
qrt(2))*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*
c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (co
s(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1
/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1) - 6*(sqrt(2)*cos(2
*d*x + 2*c)^2 + sqrt(2)*sin(2*d*x + 2*c)^2 + 2*sqrt(2)*cos(2*d*x + 2*c) + s
qrt(2))*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*
c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (co
s(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1
/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 1) + (-3*I*sqrt(2)*co
s(2*d*x + 2*c)^2 - 3*I*sqrt(2)*sin(2*d*x + 2*c)^2 - 6*I*sqrt(2)*cos(2*d*x +
 2*c) - 3*I*sqrt(2))*log(sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*c
os(2*d*x + 2*c) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1
))^2 + sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) +
1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + 2*(cos(2*d*
x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1) + (3*I*sqrt(2)*cos(2*d*x
 + 2*c)^2 + 3*I*sqrt(2)*sin(2*d*x + 2*c)^2 + 6*I*sqrt(2)*cos(2*d*x + 2*c) +
 3*I*sqrt(2))*log(sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*
x + 2*c) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 +
sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*sin(
1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 - 2*(cos(2*d*x + 2*c
)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(si
n(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1))*sqrt(a))/((a^3*cos(2*d*x + 2*c
)^2 + a^3*sin(2*d*x + 2*c)^2 + 2*a^3*cos(2*d*x + 2*c) + a^3)*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\cos\left(c+d\,x\right)^5\,{\left(a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^(5/2)),x)
```

```
[Out] int(1/(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^(5/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^5(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**5/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Integral(sec(c + d*x)**5/(I*a*(tan(c + d*x) - I))**(5/2), x)
```

3.374 $\int \frac{\sec^3(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=86

$$\frac{i\sec(c+dx)}{ad(a+ia\tan(c+dx))^{3/2}}-\frac{i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{\sqrt{2}\,a^{5/2}d}$$

```
[Out] -1/2*I*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2))/a^(
5/2)/d*2^(1/2)+I*sec(d*x+c)/a/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.14, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3501, 3502, 3489, 206}

$$\frac{i\sec(c+dx)}{ad(a+ia\tan(c+dx))^{3/2}}-\frac{i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{\sqrt{2}\,a^{5/2}d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((-I)*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[c + d*x]])])
/(Sqrt[2]*a^(5/2)*d) + (I*Sec[c + d*x])/(a*d*(a + I*a*Tan[c + d*x])^(3/2))
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{\sec^3(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx = \frac{2i\sec(c+dx)}{ad(a+ia\tan(c+dx))^{3/2}} - \frac{2\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx}{a}$$
$$= \frac{i\sec(c+dx)}{ad(a+ia\tan(c+dx))^{3/2}} - \frac{\int \frac{\sec(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx}{2a^2}$$
$$= \frac{i\sec(c+dx)}{ad(a+ia\tan(c+dx))^{3/2}} - \frac{i\,\text{Subst}\left(\int \frac{1}{2-ax^2}\,dx, x, \frac{\sec(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\right)}{a^2d}$$
$$= -\frac{i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{\sqrt{2}\,a^{5/2}d} + \frac{i\sec(c+dx)}{ad(a+ia\tan(c+dx))^{3/2}}$$

Mathematica [A] time = 1.08, size = 149, normalized size = 1.73

$$\frac{ie^{-\frac{1}{2}i(2c+dx)}\sec^3(c+dx)\left(-e^{2i(c+dx)}+e^{2i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\tanh^{-1}\left(\sqrt{1+e^{2i(c+dx)}}\right)-1\right)\left(\cos\left(c+\frac{dx}{2}\right)+i\sin\left(c\right.\right.}{2a^2d(\tan(c+dx)-i)^2\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^3/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((I/2)*(-1 - E^((2*I)*(c + d*x)) + E^((2*I)*(c + d*x))*Sqrt[1 + E^((2*I)*(c
 + d*x))]*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]])*Sec[c + d*x]^3*(Cos[c + (
d*x)/2] + I*Sin[c + (d*x)/2]))/(a^2*d*E^((I/2)*(2*c + d*x))*(-I + Tan[c + d
*x])^2*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [B] time = 0.60, size = 244, normalized size = 2.84

$$\frac{\left(i\sqrt{2}\,a^3d\sqrt{\frac{1}{a^5d^2}}\,e^{(2i\,dx+2i\,c)}\log\left(\frac{\left(2\left(i\,a^2de^{(2i\,dx+2i\,c)}+i\,a^2d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{a^5d^2}}-2i\right)e^{(-i\,dx-i\,c)}}{a^2d}\right)-i\sqrt{2}\,a^3d\sqrt{\frac{1}{a^5d^2}}\,e^{(2i\,dx+2i\,c)}\log\right.}{4\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/4*(I*sqrt(2)*a^3*d*sqrt(1/(a^5*d^2))*e^(2*I*d*x + 2*I*c)*log((2*(I*a^2*d*
e^(2*I*d*x + 2*I*c) + I*a^2*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a^
5*d^2)) - 2*I)*e^(-I*d*x - I*c)/(a^2*d)) - I*sqrt(2)*a^3*d*sqrt(1/(a^5*d^2)
)*e^(2*I*d*x + 2*I*c)*log((2*(-I*a^2*d*e^(2*I*d*x + 2*I*c) - I*a^2*d)*sqrt(
a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a^5*d^2)) - 2*I)*e^(-I*d*x - I*c)/(a^2
*d)) + sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(2*I*e^(2*I*d*x + 2*I*c) +
 2*I))*e^(-2*I*d*x - 2*I*c)/(a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec\left(dx+c\right)^3}{\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^3/(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [B] time = 1.19, size = 443, normalized size = 5.15

$$-\frac{\sin \left(dx+c\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(-i\sin\left(dx+c\right)\cos\left(dx+c\right)\sqrt{2}\,\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\,\arctan\left(\frac{(i\cos(dx+c)-i+\sin(dx+c))}{2\sin(dx+c)\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] -1/4/d*sin(d*x+c)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(-I*sin(d*
x+c)*cos(d*x+c)*2^(1/2)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*
cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^
(1/2))+8*I*cos(d*x+c)^3*sin(d*x+c)-I*sin(d*x+c)*2^(1/2)*(-2*cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos
(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))+cos(d*x+c)^2*2^(1/2)*(-2*cos(d*x+c)/
(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2
*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))-8*cos(d*x+c)^4-4*I*cos(d*x+c)*si
n(d*x+c)-2^(1/2)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x
+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))+
8*cos(d*x+c)^2)/(cos(d*x+c)^2-1)/a^3
```

maxima [B] time = 0.99, size = 826, normalized size = 9.60

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] 1/8*((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/
4)*((4*I*sqrt(2)*cos(2*d*x + 2*c) + 4*sqrt(2)*sin(2*d*x + 2*c))*cos(1/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 4*(sqrt(2)*cos(2*d*x + 2*c)
 - I*sqrt(2)*sin(2*d*x + 2*c))*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c) + 1)))*sqrt(a) + (2*sqrt(2)*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x
+ 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c),
cos(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*
d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) +
1)) + 1) - 2*sqrt(2)*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*c
os(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*
c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1
)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 1) - I*s
qrt(2)*log(sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c
) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + sqrt(co
s(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*sin(1/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + 2*(cos(2*d*x + 2*c)^2 + s
in(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x
 + 2*c), cos(2*d*x + 2*c) + 1)) + 1) + I*sqrt(2)*log(sqrt(cos(2*d*x + 2*c)^
2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*cos(1/2*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c) + 1))^2 + sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*
c)^2 + 2*cos(2*d*x + 2*c) + 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c) + 1))^2 - 2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x +
 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) +
 1))*sqrt(a))/(a^3*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\cos\left(c+d\,x\right)^3\,\left(a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^(5/2)),x)
```

```
[Out] int(1/(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^(5/2)), x)
```

sympy [F]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^3(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Integral(sec(c + d*x)**3/(I*a*(tan(c + d*x) - I))**(5/2), x)
```

3.375 $\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=122

$$\frac{3i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d}+\frac{3i\sec(c+dx)}{16ad(a+ia\tan(c+dx))^{3/2}}+\frac{i\sec(c+dx)}{4d(a+ia\tan(c+dx))^{5/2}}$$

```
[Out] 3/32*I*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2))/a^(
5/2)/d*2^(1/2)+1/4*I*sec(d*x+c)/d/(a+I*a*tan(d*x+c))^(5/2)+3/16*I*sec(d*x+c
)/a/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.12, antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3502, 3489, 206}

$$\frac{3i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d}+\frac{3i\sec(c+dx)}{16ad(a+ia\tan(c+dx))^{3/2}}+\frac{i\sec(c+dx)}{4d(a+ia\tan(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((3*I)/16)*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[c + d*
x]])])/(Sqrt[2]*a^(5/2)*d) + ((I/4)*Sec[c + d*x])/(d*(a + I*a*Tan[c + d*x])
^(5/2)) + (((3*I)/16)*Sec[c + d*x])/(a*d*(a + I*a*Tan[c + d*x])^(3/2))
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx = \frac{i\sec(c+dx)}{4d(a+ia\tan(c+dx))^{5/2}} + \frac{3\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx}{8a}$$
$$= \frac{i\sec(c+dx)}{4d(a+ia\tan(c+dx))^{5/2}} + \frac{3i\sec(c+dx)}{16ad(a+ia\tan(c+dx))^{3/2}} + \frac{3\int \frac{\sec(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx}{32a^2}$$
$$= \frac{i\sec(c+dx)}{4d(a+ia\tan(c+dx))^{5/2}} + \frac{3i\sec(c+dx)}{16ad(a+ia\tan(c+dx))^{3/2}} + \frac{(3i)\operatorname{Subst}\left(\int \frac{1}{2-ax^2}\,d\right.}{16a^2}$$
$$= \frac{3i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{16\sqrt{2}a^{5/2}d} + \frac{i\sec(c+dx)}{4d(a+ia\tan(c+dx))^{5/2}} + \frac{3i\sec(c+dx}{16ad(a+ia\tan(c+}$$

Mathematica [A] time = 0.88, size = 121, normalized size = 0.99

$$-\frac{i\sec^3(c+dx)\left(3i\sin(2(c+dx))+7\cos(2(c+dx))+3e^{2i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\tanh^{-1}\left(\sqrt{1+e^{2i(c+dx)}}\right)+7\right)}{32a^2d(\tan(c+dx)-i)^2\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((-1/32*I)*Sec[c + d*x]^3*(7 + 3*E^((2*I)*(c + d*x))*Sqrt[1 + E^((2*I)*(c +
 d*x))]*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]] + 7*Cos[2*(c + d*x)] + (3*I)
*Sin[2*(c + d*x)]))/(a^2*d*(-I + Tan[c + d*x])^2*Sqrt[a + I*a*Tan[c + d*x]]
)
```

fricas [B] time = 0.50, size = 267, normalized size = 2.19

$$\left(3i\sqrt{\frac{1}{2}}a^3d\sqrt{\frac{1}{a^5d^2}}e^{(4i\,dx+4i\,c)}\log\left(\frac{\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(24i\,a^2de^{(2i\,dx+2i\,c)}+24i\,a^2d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{a^5d^2}}+24i\right)e^{(-i\,dx-i\,c)}}{64\,a^2d}\right)-3i\sqrt{\frac{1}{2}}a^3d\sqrt{\frac{1}{a^5d^2}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/32*(3*I*sqrt(1/2)*a^3*d*sqrt(1/(a^5*d^2))*e^(4*I*d*x + 4*I*c)*log(1/64*(s
qrt(2)*sqrt(1/2)*(24*I*a^2*d*e^(2*I*d*x + 2*I*c) + 24*I*a^2*d)*sqrt(a/(e^(2
*I*d*x + 2*I*c) + 1))*sqrt(1/(a^5*d^2)) + 24*I)*e^(-I*d*x - I*c)/(a^2*d)) -
 3*I*sqrt(1/2)*a^3*d*sqrt(1/(a^5*d^2))*e^(4*I*d*x + 4*I*c)*log(1/64*(sqrt(2
)*sqrt(1/2)*(-24*I*a^2*d*e^(2*I*d*x + 2*I*c) - 24*I*a^2*d)*sqrt(a/(e^(2*I*d
*x + 2*I*c) + 1))*sqrt(1/(a^5*d^2)) + 24*I)*e^(-I*d*x - I*c)/(a^2*d)) + sqr
t(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(5*I*e^(4*I*d*x + 4*I*c) + 7*I*e^(2*
I*d*x + 2*I*c) + 2*I))*e^(-4*I*d*x - 4*I*c)/(a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)}{(i\,a\tan(dx+c)+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)/(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [B] time = 1.07, size = 346, normalized size = 2.84

$$\left(64i\left(\cos^5(dx+c)\right)+3i\cos(dx+c)\sqrt{2}\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\arctan\left(\frac{(i\cos(dx+c)-i+\sin(dx+c))\sqrt{2}}{2\sin(dx+c)\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}}\right)+64\sin(dx+c)\left(\cos^4\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)/(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 1/64/d*(64*I*cos(d*x+c)^5+3*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1
/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1
/2)*2^(1/2))*cos(d*x+c)*2^(1/2)+64*sin(d*x+c)*cos(d*x+c)^4+3*2^(1/2)*sin(d*
x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*
x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))+3*I*(-2*cos(
d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x
+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)-24*I*cos(d*x+c)^3
+8*cos(d*x+c)^2*sin(d*x+c)-12*I*cos(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/co
s(d*x+c))^(1/2)/a^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)}{(i\,a\tan(dx+c)+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(sec(d*x + c)/(I*a*tan(d*x + c) + a)^(5/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\cos(c+d\,x)\,\left(a+a\tan(c+d\,x)\,1\mathrm{i}\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^(5/2)),x)
```

```
[Out] int(1/(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^(5/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Integral(sec(c + d*x)/(I*a*(tan(c + d*x) - I))**(5/2), x)
```

3.376 $\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=192

$$\frac{35i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{128\sqrt{2}\,a^{5/2}d}-\frac{35i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{128a^3d}+\frac{35i\cos(c+dx)}{192a^2d\sqrt{a+ia\tan(c+dx)}}+\frac{7i\cos}{48ad(a+ia}$$

```
[Out] 35/256*I*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2))/a
^(5/2)/d*2^(1/2)+35/192*I*cos(d*x+c)/a^2/d/(a+I*a*tan(d*x+c))^(1/2)-35/128*
I*cos(d*x+c)*(a+I*a*tan(d*x+c))^(1/2)/a^3/d+1/6*I*cos(d*x+c)/d/(a+I*a*tan(d
*x+c))^(5/2)+7/48*I*cos(d*x+c)/a/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.26, antiderivative size = 192, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {3502, 3490, 3489, 206}

$$-\frac{35i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{128a^3d}+\frac{35i\cos(c+dx)}{192a^2d\sqrt{a+ia\tan(c+dx)}}+\frac{35i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{128\sqrt{2}\,a^{5/2}d}+\frac{7i\,c}{48ad(a+}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((35*I)/128)*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[c +
d*x]])]])/(Sqrt[2]*a^(5/2)*d) + ((I/6)*Cos[c + d*x])/(d*(a + I*a*Tan[c + d*x
])^(5/2)) + (((7*I)/48)*Cos[c + d*x])/(a*d*(a + I*a*Tan[c + d*x])^(3/2)) +
(((35*I)/192)*Cos[c + d*x])/(a^2*d*Sqrt[a + I*a*Tan[c + d*x]]) - (((35*I)/1
28)*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])/(a^3*d)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3490

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] + Dist[a/(2*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b*Tan[e +
f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] &&
EqQ[m/2 + n, 0] && GtQ[n, 0]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx = \frac{i\cos(c+dx)}{6d(a+ia\tan(c+dx))^{5/2}} + \frac{7\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx}{12a}$$
$$= \frac{i\cos(c+dx)}{6d(a+ia\tan(c+dx))^{5/2}} + \frac{7i\cos(c+dx)}{48ad(a+ia\tan(c+dx))^{3/2}} + \frac{35\int \frac{\cos(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx}{96a^2}$$
$$= \frac{i\cos(c+dx)}{6d(a+ia\tan(c+dx))^{5/2}} + \frac{7i\cos(c+dx)}{48ad(a+ia\tan(c+dx))^{3/2}} + \frac{35i\cos(c+dx)}{192a^2d\sqrt{a+ia\tan(c+}}$$
$$= \frac{i\cos(c+dx)}{6d(a+ia\tan(c+dx))^{5/2}} + \frac{7i\cos(c+dx)}{48ad(a+ia\tan(c+dx))^{3/2}} + \frac{35i\cos(c+dx)}{192a^2d\sqrt{a+ia\tan(c+}}$$
$$= \frac{i\cos(c+dx)}{6d(a+ia\tan(c+dx))^{5/2}} + \frac{7i\cos(c+dx)}{48ad(a+ia\tan(c+dx))^{3/2}} + \frac{35i\cos(c+dx)}{192a^2d\sqrt{a+ia\tan(c+}}$$
$$= \frac{35i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{128\sqrt{2}a^{5/2}d} + \frac{i\cos(c+dx)}{6d(a+ia\tan(c+dx))^{5/2}} + \frac{7i\cos(c+dx)}{48ad(a+ia\tan(c+}$$

Mathematica [A] time = 1.37, size = 143, normalized size = 0.74

$$\frac{i\sec^3(c+dx)\left(7i\sin(2(c+dx))+56i\sin(4(c+dx))-85\cos(2(c+dx))+40\cos(4(c+dx))-105e^{2i(c+dx)}\sqrt{1+e^{2}}\right.}{768a^2d(\tan(c+dx)-i)^2\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((I/768)*Sec[c + d*x]^3*(-125 - 105*E^((2*I)*(c + d*x))*Sqrt[1 + E^((2*I)*(
c + d*x))]*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]] - 85*Cos[2*(c + d*x)] + 4
0*Cos[4*(c + d*x)] + (7*I)*Sin[2*(c + d*x)] + (56*I)*Sin[4*(c + d*x)]))/(a^
2*d*(-I + Tan[c + d*x])^2*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.69, size = 289, normalized size = 1.51

$$\left(105i\sqrt{\frac{1}{2}}a^3d\sqrt{\frac{1}{a^5d^2}}e^{(6i\,dx+6i\,c)}\log\left(\frac{\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(2240i\,a^2de^{(2i\,dx+2i\,c)}+2240i\,a^2d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{a^5d^2}}+2240i\right)e^{(-i\,dx-i\,c)}}{4096\,a^2d}\right)-105i\sqrt{\frac{1}{2}}a^3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/768*(105*I*sqrt(1/2)*a^3*d*sqrt(1/(a^5*d^2))*e^(6*I*d*x + 6*I*c)*log(1/40
96*(sqrt(2)*sqrt(1/2)*(2240*I*a^2*d*e^(2*I*d*x + 2*I*c) + 2240*I*a^2*d)*sqr
t(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a^5*d^2)) + 2240*I)*e^(-I*d*x - I*c)
/(a^2*d)) - 105*I*sqrt(1/2)*a^3*d*sqrt(1/(a^5*d^2))*e^(6*I*d*x + 6*I*c)*log
(1/4096*(sqrt(2)*sqrt(1/2)*(-2240*I*a^2*d*e^(2*I*d*x + 2*I*c) - 2240*I*a^2*
d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a^5*d^2)) + 2240*I)*e^(-I*d*x
- I*c)/(a^2*d)) + sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-48*I*e^(8*I*d
*x + 8*I*c) + 39*I*e^(6*I*d*x + 6*I*c) + 125*I*e^(4*I*d*x + 4*I*c) + 46*I*e
^(2*I*d*x + 2*I*c) + 8*I))*e^(-6*I*d*x - 6*I*c)/(a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos(dx+c)}{(i\,a\tan(dx+c)+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate(cos(d*x + c)/(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [B] time = 1.09, size = 373, normalized size = 1.94

$$\frac{\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(1024i\left(\cos^7(dx+c)\right)+1024\sin(dx+c)\left(\cos^6(dx+c)\right)-320i\left(\cos^5(dx+c)\right)+105i\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)/(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 1/1536/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(1024*I*cos(d*x+c)^
7+1024*sin(d*x+c)*cos(d*x+c)^6-320*I*cos(d*x+c)^5+105*I*(-2*cos(d*x+c)/(1+c
os(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos
(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*cos(d*x+c)*2^(1/2)+192*sin(d*x+c)*co
s(d*x+c)^4+105*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x
+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*
2^(1/2)+56*I*cos(d*x+c)^3+105*2^(1/2)*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+
c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)
/(1+cos(d*x+c)))^(1/2)*2^(1/2))+280*cos(d*x+c)^2*sin(d*x+c)-420*I*cos(d*x+c
))/a^3
```

maxima [B] time = 1.23, size = 2297, normalized size = 11.96

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] -1/3072*((cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + sin(1/3*
arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + 2*cos(1/3*arctan2(sin(6*d*
x + 6*c), cos(6*d*x + 6*c))) + 1)^(3/4)*((544*I*sqrt(2)*cos(6*d*x + 6*c) +
544*sqrt(2)*sin(6*d*x + 6*c))*cos(3/2*arctan2(sin(1/3*arctan2(sin(6*d*x + 6
*c), cos(6*d*x + 6*c))), cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)
)) + 1)) - 544*(sqrt(2)*cos(6*d*x + 6*c) - I*sqrt(2)*sin(6*d*x + 6*c))*sin(
3/2*arctan2(sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))), cos(1/3*a
rctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)))*sqrt(a) + (cos(1/3*arcta
n2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + sin(1/3*arctan2(sin(6*d*x + 6*c
), cos(6*d*x + 6*c)))^2 + 2*cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6
*c))) + 1)^(1/4)*(((-348*I*sqrt(2)*cos(6*d*x + 6*c) - 348*sqrt(2)*sin(6*d*x
 + 6*c))*cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + (-348*I*s
qrt(2)*cos(6*d*x + 6*c) - 348*sqrt(2)*sin(6*d*x + 6*c))*sin(1/3*arctan2(sin
(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + (-696*I*sqrt(2)*cos(6*d*x + 6*c) - 69
6*sqrt(2)*sin(6*d*x + 6*c))*cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6
*c))) - 348*I*sqrt(2)*cos(6*d*x + 6*c) - 348*sqrt(2)*sin(6*d*x + 6*c))*cos(
5/2*arctan2(sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))), cos(1/3*a
rctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)) + (-228*I*sqrt(2)*cos(6*d
*x + 6*c) - 228*sqrt(2)*sin(6*d*x + 6*c) + 192*I*sqrt(2))*cos(1/2*arctan2(s
in(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))), cos(1/3*arctan2(sin(6*
d*x + 6*c), cos(6*d*x + 6*c))) + 1)) + 348*((sqrt(2)*cos(6*d*x + 6*c) - I*s
qrt(2)*sin(6*d*x + 6*c))*cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)
))^2 + (sqrt(2)*cos(6*d*x + 6*c) - I*sqrt(2)*sin(6*d*x + 6*c))*sin(1/3*arct
an2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + 2*(sqrt(2)*cos(6*d*x + 6*c) -
I*sqrt(2)*sin(6*d*x + 6*c))*cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6
*c))) + sqrt(2)*cos(6*d*x + 6*c) - I*sqrt(2)*sin(6*d*x + 6*c))*sin(5/2*arct
```

```
an2(sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))), cos(1/3*arctan2(s
in(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)) + 12*(19*sqrt(2)*cos(6*d*x + 6*c)
 - 19*I*sqrt(2)*sin(6*d*x + 6*c) - 16*sqrt(2))*sin(1/2*arctan2(sin(1/3*arct
an2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))), cos(1/3*arctan2(sin(6*d*x + 6*c),
 cos(6*d*x + 6*c))) + 1)))*sqrt(a) + (210*sqrt(2)*arctan2((cos(1/3*arctan2(
sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + sin(1/3*arctan2(sin(6*d*x + 6*c),
cos(6*d*x + 6*c)))^2 + 2*cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)
)) + 1)^(1/4)*sin(1/2*arctan2(sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x +
 6*c))), cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)), (cos(1
/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + sin(1/3*arctan2(sin(6*d
*x + 6*c), cos(6*d*x + 6*c)))^2 + 2*cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6
*d*x + 6*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(1/3*arctan2(sin(6*d*x + 6*c),
cos(6*d*x + 6*c))), cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) +
1)) + 1) - 210*sqrt(2)*arctan2((cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x
 + 6*c)))^2 + sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + 2*co
s(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)^(1/4)*sin(1/2*arcta
n2(sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))), cos(1/3*arctan2(si
n(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)), (cos(1/3*arctan2(sin(6*d*x + 6*c)
, cos(6*d*x + 6*c)))^2 + sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)
))^2 + 2*cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)^(1/4)*co
s(1/2*arctan2(sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))), cos(1/3
*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)) - 1) - 105*I*sqrt(2)*lo
g(sqrt(cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + sin(1/3*arc
tan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + 2*cos(1/3*arctan2(sin(6*d*x +
 6*c), cos(6*d*x + 6*c))) + 1)*cos(1/2*arctan2(sin(1/3*arctan2(sin(6*d*x +
6*c), cos(6*d*x + 6*c))), cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c
))) + 1))^2 + sqrt(cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 +
 sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + 2*cos(1/3*arctan2
(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)*sin(1/2*arctan2(sin(1/3*arctan2(
sin(6*d*x + 6*c), cos(6*d*x + 6*c))), cos(1/3*arctan2(sin(6*d*x + 6*c), cos
(6*d*x + 6*c))) + 1))^2 + 2*(cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x +
6*c)))^2 + sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + 2*cos(1
/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)^(1/4)*cos(1/2*arctan2(
sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))), cos(1/3*arctan2(sin(6
*d*x + 6*c), cos(6*d*x + 6*c))) + 1)) + 1) + 105*I*sqrt(2)*log(sqrt(cos(1/3
*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + sin(1/3*arctan2(sin(6*d*x
 + 6*c), cos(6*d*x + 6*c)))^2 + 2*cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d
*x + 6*c))) + 1)*cos(1/2*arctan2(sin(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*
x + 6*c))), cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1))^2 +
sqrt(cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + sin(1/3*arcta
n2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + 2*cos(1/3*arctan2(sin(6*d*x + 6
*c), cos(6*d*x + 6*c))) + 1)*sin(1/2*arctan2(sin(1/3*arctan2(sin(6*d*x + 6*
c), cos(6*d*x + 6*c))), cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))
) + 1))^2 - 2*(cos(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + sin
(1/3*arctan2(sin(6*d*x + 6*c), cos(6*d*x + 6*c)))^2 + 2*cos(1/3*arctan2(sin
(6*d*x + 6*c), cos(6*d*x + 6*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(1/3*arctan
2(sin(6*d*x + 6*c), cos(6*d*x + 6*c))), cos(1/3*arctan2(sin(6*d*x + 6*c), c
os(6*d*x + 6*c))) + 1)) + 1))*sqrt(a))/(a^3*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\cos(c + d\,x)}{\left(a + a\tan(c + d\,x)\,1\mathrm{i}\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)/(a + a*tan(c + d*x)*1i)^(5/2),x)
```

```
[Out] int(cos(c + d*x)/(a + a*tan(c + d*x)*1i)^(5/2), x)
```

sympy [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Integral(cos(c + d*x)/(I*a*(tan(c + d*x) - I))**(5/2), x)
```

3.377 $\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=270

$$\frac{1155i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{4096\sqrt{2}a^{5/2}d}-\frac{77i\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{512a^3d}-\frac{1155i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{4096a^3d}+\frac{}{2}$$

```
[Out] 1155/8192*I*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2)
)/a^(5/2)/d*2^(1/2)+385/2048*I*cos(d*x+c)/a^2/d/(a+I*a*tan(d*x+c))^(1/2)+33
/256*I*cos(d*x+c)^3/a^2/d/(a+I*a*tan(d*x+c))^(1/2)-1155/4096*I*cos(d*x+c)*(
a+I*a*tan(d*x+c))^(1/2)/a^3/d-77/512*I*cos(d*x+c)^3*(a+I*a*tan(d*x+c))^(1/2
)/a^3/d+1/8*I*cos(d*x+c)^3/d/(a+I*a*tan(d*x+c))^(5/2)+11/96*I*cos(d*x+c)^3/
a/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.42, antiderivative size = 270, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {3502, 3497, 3490, 3489, 206}

$$-\frac{77i\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{512a^3d}+\frac{33i\cos^3(c+dx)}{256a^2d\sqrt{a+ia\tan(c+dx)}}-\frac{1155i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{4096a^3d}+\frac{}{2048}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((1155*I)/4096)*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[c
 + d*x]])])/(Sqrt[2]*a^(5/2)*d) + ((I/8)*Cos[c + d*x]^3)/(d*(a + I*a*Tan[c
+ d*x])^(5/2)) + (((11*I)/96)*Cos[c + d*x]^3)/(a*d*(a + I*a*Tan[c + d*x])^(
3/2)) + (((385*I)/2048)*Cos[c + d*x])/(a^2*d*Sqrt[a + I*a*Tan[c + d*x]]) +
(((33*I)/256)*Cos[c + d*x]^3)/(a^2*d*Sqrt[a + I*a*Tan[c + d*x]]) - (((1155*
I)/4096)*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])/(a^3*d) - (((77*I)/512)*C
os[c + d*x]^3*Sqrt[a + I*a*Tan[c + d*x]])/(a^3*d)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3490

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] + Dist[a/(2*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b*Tan[e +
f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] &&
EqQ[m/2 + n, 0] && GtQ[n, 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
```

```
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx = \frac{i\cos^3(c+dx)}{8d(a+ia\tan(c+dx))^{5/2}} + \frac{11\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx}{16a}$$

$$= \frac{i\cos^3(c+dx)}{8d(a+ia\tan(c+dx))^{5/2}} + \frac{11i\cos^3(c+dx)}{96ad(a+ia\tan(c+dx))^{3/2}} + \frac{33\int \frac{\cos^3(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,d}{64a^2}$$

$$= \frac{i\cos^3(c+dx)}{8d(a+ia\tan(c+dx))^{5/2}} + \frac{11i\cos^3(c+dx)}{96ad(a+ia\tan(c+dx))^{3/2}} + \frac{33i\cos^3(c+dx}{256a^2d\sqrt{a+ia\tan(c}}$$

$$= \frac{i\cos^3(c+dx)}{8d(a+ia\tan(c+dx))^{5/2}} + \frac{11i\cos^3(c+dx)}{96ad(a+ia\tan(c+dx))^{3/2}} + \frac{33i\cos^3(c+dx}{256a^2d\sqrt{a+ia\tan(c}}$$

$$= \frac{i\cos^3(c+dx)}{8d(a+ia\tan(c+dx))^{5/2}} + \frac{11i\cos^3(c+dx)}{96ad(a+ia\tan(c+dx))^{3/2}} + \frac{385i\cos(c+d}{2048a^2d\sqrt{a+ia\tan(}}$$

$$= \frac{i\cos^3(c+dx)}{8d(a+ia\tan(c+dx))^{5/2}} + \frac{11i\cos^3(c+dx)}{96ad(a+ia\tan(c+dx))^{3/2}} + \frac{385i\cos(c+d}{2048a^2d\sqrt{a+ia\tan(}}$$

$$= \frac{i\cos^3(c+dx)}{8d(a+ia\tan(c+dx))^{5/2}} + \frac{11i\cos^3(c+dx)}{96ad(a+ia\tan(c+dx))^{3/2}} + \frac{385i\cos(c+d}{2048a^2d\sqrt{a+ia\tan(}}$$

$$= \frac{1155i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{4096\sqrt{2}a^{5/2}d} + \frac{i\cos^3(c+dx)}{8d(a+ia\tan(c+dx))^{5/2}} + \frac{11i\cos^3(c}{96ad(a+ia\tan}$$

Mathematica [A] time = 1.39, size = 165, normalized size = 0.61

$$\frac{i\sec^3(c+dx)\left(1111i\sin(2(c+dx)) + 2552i\sin(4(c+dx)) + 176i\sin(6(c+dx)) - 1605\cos(2(c+dx)) + 1800\right.}{24576a^2d(\tan(c+dx)-i)^2\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((I/24576)*Sec[c + d*x]^3*(-3325 - 3465*E^((2*I)*(c + d*x))*Sqrt[1 + E^((2*
I)*(c + d*x))]*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]] - 1605*Cos[2*(c + d*x
)] + 1800*Cos[4*(c + d*x)] + 80*Cos[6*(c + d*x)] + (1111*I)*Sin[2*(c + d*x)
] + (2552*I)*Sin[4*(c + d*x)] + (176*I)*Sin[6*(c + d*x)]))/(a^2*d*(-I + Tan
[c + d*x])^2*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.81, size = 311, normalized size = 1.15

$$\left(3465i\sqrt{\frac{1}{2}}a^3d\sqrt{\frac{1}{a^5d^2}}e^{(8i\,dx+8i\,c)}\log\left(\frac{\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(2365440i\,a^2de^{(2i\,dx+2i\,c)}+2365440i\,a^2d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{a^5d^2}}+2365440i\right)e^{(-i\,dx-i\,c)}}{4194304\,a^2d}\right)-34$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/24576*(3465*I*sqrt(1/2)*a^3*d*sqrt(1/(a^5*d^2))*e^(8*I*d*x + 8*I*c)*log(1
/4194304*(sqrt(2)*sqrt(1/2)*(2365440*I*a^2*d*e^(2*I*d*x + 2*I*c) + 2365440*
I*a^2*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a^5*d^2)) + 2365440*I)*e
^(-I*d*x - I*c)/(a^2*d)) - 3465*I*sqrt(1/2)*a^3*d*sqrt(1/(a^5*d^2))*e^(8*I*
d*x + 8*I*c)*log(1/4194304*(sqrt(2)*sqrt(1/2)*(-2365440*I*a^2*d*e^(2*I*d*x
+ 2*I*c) - 2365440*I*a^2*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a^5*d
^2)) + 2365440*I)*e^(-I*d*x - I*c)/(a^2*d)) + sqrt(2)*sqrt(a/(e^(2*I*d*x +
2*I*c) + 1))*(-128*I*e^(12*I*d*x + 12*I*c) - 2176*I*e^(10*I*d*x + 10*I*c) +
 247*I*e^(8*I*d*x + 8*I*c) + 3325*I*e^(6*I*d*x + 6*I*c) + 1358*I*e^(4*I*d*x
 + 4*I*c) + 376*I*e^(2*I*d*x + 2*I*c) + 48*I))*e^(-8*I*d*x - 8*I*c)/(a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos(dx+c)^3}{(i\,a\tan(dx+c)+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate(cos(d*x + c)^3/(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [A] time = 1.25, size = 400, normalized size = 1.48

$$\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(24576i\left(\cos^9(dx+c)\right)+24576\sin(dx+c)\left(\cos^8(dx+c)\right)-7168i\left(\cos^7(dx+c)\right)+512\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 1/49152/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(24576*I*cos(d*x+c
)^9+24576*sin(d*x+c)*cos(d*x+c)^8-7168*I*cos(d*x+c)^7+5120*sin(d*x+c)*cos(d
*x+c)^6+704*I*cos(d*x+c)^5+3465*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arct
an(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c))
)^(1/2)*2^(1/2))*2^(1/2)*cos(d*x+c)+6336*sin(d*x+c)*cos(d*x+c)^4+3465*I*(-2
*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*
x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))+1848*I*cos(d
*x+c)^3+3465*2^(1/2)*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan
(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^
(1/2)*2^(1/2))+9240*cos(d*x+c)^2*sin(d*x+c)-13860*I*cos(d*x+c))/a^3
```

maxima [B] time = 1.38, size = 3783, normalized size = 14.01

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")

[Out] 1/98304*((cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)^(3/4)*(((60*I*sqrt(2)*cos(8*d*x + 8*c) + 60*sqrt(2)*sin(8*d*x + 8*c))*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + (60*I*sqrt(2)*cos(8*d*x + 8*c) + 60*sqrt(2)*sin(8*d*x + 8*c))*sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + (120*I*sqrt(2)*cos(8*d*x + 8*c) + 120*sqrt(2)*sin(8*d*x + 8*c))*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 60*I*sqrt(2)*cos(8*d*x + 8*c) + 60*sqrt(2)*sin(8*d*x + 8*c))*cos(7/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)) + (-220*I*sqrt(2)*cos(8*d*x + 8*c) - 3840*I*sqrt(2)*cos(3/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 5184*I*sqrt(2)*cos(1/2*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) - 220*sqrt(2)*sin(8*d*x + 8*c) - 3840*sqrt(2)*sin(3/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 5184*sqrt(2)*sin(1/2*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) - 512*I*sqrt(2))*cos(3/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)) - (60*(sqrt(2)*cos(8*d*x + 8*c) - I*sqrt(2)*sin(8*d*x + 8*c))*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 60*(sqrt(2)*cos(8*d*x + 8*c) - I*sqrt(2)*sin(8*d*x + 8*c))*sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 120*(sqrt(2)*cos(8*d*x + 8*c) - I*sqrt(2)*sin(8*d*x + 8*c))*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 60*sqrt(2)*cos(8*d*x + 8*c) - 60*I*sqrt(2)*sin(8*d*x + 8*c))*sin(7/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)) + (220*sqrt(2)*cos(8*d*x + 8*c) + 3840*sqrt(2)*cos(3/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) - 5184*sqrt(2)*cos(1/2*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) - 220*I*sqrt(2)*sin(8*d*x + 8*c) - 3840*I*sqrt(2)*sin(3/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 5184*I*sqrt(2)*sin(1/2*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 512*sqrt(2))*sin(3/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)))*sqrt(a) + (cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)^(1/4)*(((292*I*sqrt(2)*cos(8*d*x + 8*c) + 292*sqrt(2)*sin(8*d*x + 8*c))*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + (292*I*sqrt(2)*cos(8*d*x + 8*c) + 292*sqrt(2)*sin(8*d*x + 8*c))*sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + (3168*I*sqrt(2)*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 3168*I*sqrt(2)*sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 6336*I*sqrt(2)*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 3168*I*sqrt(2))*cos(3/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + (584*I*sqrt(2)*cos(8*d*x + 8*c) + 584*sqrt(2)*sin(8*d*x + 8*c))*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 3168*(sqrt(2)*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + sqrt(2)*sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + sqrt(2))*sin(3/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 292*I*sqrt(2)*cos(8*d*x + 8*c) + 292*sqrt(2)*sin(8*d*x + 8*c))*cos(5/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)) + (60*I*sqrt(2)*cos(8*d*x + 8*c) + 1440*I*sqrt(2)*cos(3/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) - 4032*I*sqrt(2)*cos(1/2*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 768*I*sqrt(2)*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 60*sqrt(2)*sin(8*d*x + 8*c) + 1440*sqrt(2)*sin(3/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) - 4032*sqrt(2)*sin(1/2*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 768*sqrt(2)*sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) - 7680*I*sqrt(2))*cos(1/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)) - (292*(sqrt(2)*cos(8*d*x + 8*c) - I*sqrt(2)*sin(8*d*x + 8*c))*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 292*(sqrt(2)*cos(8*d*x + 8*c) - I*sqrt(2)*sin(8*d*x + 8*c)

)*sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 3168*(sqrt(2)*co
s(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + sqrt(2)*sin(1/4*arct
an2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(
8*d*x + 8*c), cos(8*d*x + 8*c))) + sqrt(2))*cos(3/4*arctan2(sin(8*d*x + 8*c
), cos(8*d*x + 8*c))) + 584*(sqrt(2)*cos(8*d*x + 8*c) - I*sqrt(2)*sin(8*d*x
 + 8*c))*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) - (3168*I*sqr
t(2)*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 3168*I*sqrt(2
)*sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 6336*I*sqrt(2)*c
os(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 3168*I*sqrt(2))*sin(3
/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 292*sqrt(2)*cos(8*d*x + 8
*c) - 292*I*sqrt(2)*sin(8*d*x + 8*c))*sin(5/2*arctan2(sin(1/4*arctan2(sin(8
*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*
x + 8*c))) + 1)) - (60*sqrt(2)*cos(8*d*x + 8*c) + 1440*sqrt(2)*cos(3/4*arct
an2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) - 4032*sqrt(2)*cos(1/2*arctan2(sin
(8*d*x + 8*c), cos(8*d*x + 8*c))) + 768*sqrt(2)*cos(1/4*arctan2(sin(8*d*x +
 8*c), cos(8*d*x + 8*c))) - 60*I*sqrt(2)*sin(8*d*x + 8*c) - 1440*I*sqrt(2)*
sin(3/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 4032*I*sqrt(2)*sin(1
/2*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) - 768*I*sqrt(2)*sin(1/4*arc
tan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) - 7680*sqrt(2))*sin(1/2*arctan2(s
in(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*
d*x + 8*c), cos(8*d*x + 8*c))) + 1)))*sqrt(a) - (6930*sqrt(2)*arctan2((cos(
1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + sin(1/4*arctan2(sin(8*
d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(
8*d*x + 8*c))) + 1)^(1/4)*sin(1/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c),
 cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) +
 1)), (cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + sin(1/4*arc
tan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2*cos(1/4*arctan2(sin(8*d*x +
 8*c), cos(8*d*x + 8*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(1/4*arctan2(sin(8*
d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x
 + 8*c))) + 1)) + 1) - 6930*sqrt(2)*arctan2((cos(1/4*arctan2(sin(8*d*x + 8*
c), cos(8*d*x + 8*c)))^2 + sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*
c)))^2 + 2*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)^(1/4)*
sin(1/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1
/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)), (cos(1/4*arctan2(sin
(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + sin(1/4*arctan2(sin(8*d*x + 8*c), cos
(8*d*x + 8*c)))^2 + 2*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))
+ 1)^(1/4)*cos(1/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*
c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)) - 1) - 346
5*I*sqrt(2)*log(sqrt(cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2
 + sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2*cos(1/4*arcta
n2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)*cos(1/2*arctan2(sin(1/4*arctan
2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), c
os(8*d*x + 8*c))) + 1))^2 + sqrt(cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*
x + 8*c)))^2 + sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2*c
os(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)*sin(1/2*arctan2(si
n(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d
*x + 8*c), cos(8*d*x + 8*c))) + 1))^2 + 2*(cos(1/4*arctan2(sin(8*d*x + 8*c)
, cos(8*d*x + 8*c)))^2 + sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)
))^2 + 2*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)^(1/4)*co
s(1/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4
*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)) + 1) + 3465*I*sqrt(2)*l
og(sqrt(cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + sin(1/4*ar
ctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2*cos(1/4*arctan2(sin(8*d*x
+ 8*c), cos(8*d*x + 8*c))) + 1)*cos(1/2*arctan2(sin(1/4*arctan2(sin(8*d*x +
 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*
c))) + 1))^2 + sqrt(cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2
+ sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2*cos(1/4*arctan
2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)*sin(1/2*arctan2(sin(1/4*arctan2
(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), co

```
s(8*d*x + 8*c))) + 1))^2 - 2*(cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x +
 8*c)))^2 + sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2*cos(
1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)^(1/4)*cos(1/2*arctan2
(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(
8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)) + 1))*sqrt(a))/(a^3*d)
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\cos\left(c+d\,x\right)^3}{{\left(a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3/(a + a*tan(c + d*x)*1i)^(5/2),x)
[Out] int(cos(c + d*x)^3/(a + a*tan(c + d*x)*1i)^(5/2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3/(a+I*a*tan(d*x+c))**(5/2),x)
[Out] Timed out
```

3.378 $\int \frac{\sec^{10}(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=146

$$-\frac{2i(a+ia\tan(c+dx))^{11/2}}{11a^9d}+\frac{16i(a+ia\tan(c+dx))^{9/2}}{9a^8d}-\frac{48i(a+ia\tan(c+dx))^{7/2}}{7a^7d}+\frac{64i(a+ia\tan(c+dx))^{5/2}}{5a^6d}-\frac{32i}{}$$

```
[Out] -32/3*I*(a+I*a*tan(d*x+c))^(3/2)/a^5/d+64/5*I*(a+I*a*tan(d*x+c))^(5/2)/a^6/
d-48/7*I*(a+I*a*tan(d*x+c))^(7/2)/a^7/d+16/9*I*(a+I*a*tan(d*x+c))^(9/2)/a^8
/d-2/11*I*(a+I*a*tan(d*x+c))^(11/2)/a^9/d
```

Rubi [A] time = 0.09, antiderivative size = 146, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {3487, 43}

$$-\frac{2i(a+ia\tan(c+dx))^{11/2}}{11a^9d}+\frac{16i(a+ia\tan(c+dx))^{9/2}}{9a^8d}-\frac{48i(a+ia\tan(c+dx))^{7/2}}{7a^7d}+\frac{64i(a+ia\tan(c+dx))^{5/2}}{5a^6d}-\frac{32i}{}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^10/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((-32*I)/3)*(a + I*a*Tan[c + d*x])^(3/2))/(a^5*d) + (((64*I)/5)*(a + I*a*T
an[c + d*x])^(5/2))/(a^6*d) - (((48*I)/7)*(a + I*a*Tan[c + d*x])^(7/2))/(a^
7*d) + (((16*I)/9)*(a + I*a*Tan[c + d*x])^(9/2))/(a^8*d) - (((2*I)/11)*(a +
 I*a*Tan[c + d*x])^(11/2))/(a^9*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sec^{10}(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^4\sqrt{a+x}\,dx,x,ia\tan(c+dx)\right)}{a^9d}\\
&= -\frac{i\,\text{Subst}\left(\int \left(16a^4\sqrt{a+x}-32a^3(a+x)^{3/2}+24a^2(a+x)^{5/2}-8a(a+x)^{7/2}+(a+x\right.\right.}{a^9d}\\
&= -\frac{32i(a+ia\tan(c+dx))^{3/2}}{3a^5d}+\frac{64i(a+ia\tan(c+dx))^{5/2}}{5a^6d}-\frac{48i(a+ia\tan(c+dx))^{7}}{7a^7d}
\end{aligned}$$

Mathematica [A] time = 0.97, size = 114, normalized size = 0.78

$$\frac{2\sec^9(c+dx)(-1144i\sin(2(c+dx))-1027i\sin(4(c+dx))+2552\cos(2(c+dx))+1283\cos(4(c+dx))+1584)}{3465a^3d(\tan(c+dx)-i)^3\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^10/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (2*Sec[c + d*x]^9*(1584 + 2552*Cos[2*(c + d*x)] + 1283*Cos[4*(c + d*x)] - (
1144*I)*Sin[2*(c + d*x)] - (1027*I)*Sin[4*(c + d*x)])*(Cos[5*(c + d*x)] + I
*Sin[5*(c + d*x)]))/(3465*a^3*d*(-I + Tan[c + d*x])^3*Sqrt[a + I*a*Tan[c +
d*x]])
```

fricas [A] time = 0.78, size = 160, normalized size = 1.10

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(-8192i\,e^{(11i\,dx+11i\,c)}-45056i\,e^{(9i\,dx+9i\,c)}-101376i\,e^{(7i\,dx+7i\,c)}-118272i\,e^{(5i\,dx+5i\,c)}-73920i\,e^{(3i}\right.}{3465\left(a^4de^{(10i\,dx+10i\,c)}+5\,a^4de^{(8i\,dx+8i\,c)}+10\,a^4de^{(6i\,dx+6i\,c)}+10\,a^4de^{(4i\,dx+4i\,c)}+5\,a^4de^{(2i\,dx+2i\,c)}+a^4d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/3465*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-8192*I*e^(11*I*d*x + 11*
I*c) - 45056*I*e^(9*I*d*x + 9*I*c) - 101376*I*e^(7*I*d*x + 7*I*c) - 118272*
I*e^(5*I*d*x + 5*I*c) - 73920*I*e^(3*I*d*x + 3*I*c))/(a^4*d*e^(10*I*d*x + 1
0*I*c) + 5*a^4*d*e^(8*I*d*x + 8*I*c) + 10*a^4*d*e^(6*I*d*x + 6*I*c) + 10*a^
4*d*e^(4*I*d*x + 4*I*c) + 5*a^4*d*e^(2*I*d*x + 2*I*c) + a^4*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec\left(dx+c\right)^{10}}{\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^10/(I*a*tan(d*x + c) + a)^(7/2), x)
```

maple [A] time = 1.46, size = 117, normalized size = 0.80

$$\frac{2\left(-2048i\left(\cos^5\left(dx+c\right)\right)+2048\sin\left(dx+c\right)\left(\cos^4\left(dx+c\right)\right)-4876i\left(\cos^3\left(dx+c\right)\right)-3340\left(\cos^2\left(dx+c\right)\right)\sin\right.}{3465d\cos\left(dx+c\right)^5a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] 2/3465/d*(-2048*I*cos(d*x+c)^5+2048*sin(d*x+c)*cos(d*x+c)^4-4876*I*cos(d*x+
c)^3-3340*cos(d*x+c)^2*sin(d*x+c)+1505*I*cos(d*x+c)+315*sin(d*x+c))*(a*(I*s
in(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^5/a^4
```

maxima [A] time = 0.74, size = 94, normalized size = 0.64

$$-\frac{2i\left(315\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{11}{2}}-3080\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{9}{2}}a+11880\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{7}{2}}a^2-22176\left(i\,a\tan\right.\right.}{3465\,a^9d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^10/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] -2/3465*I*(315*(I*a*tan(d*x + c) + a)^(11/2) - 3080*(I*a*tan(d*x + c) + a)^
(9/2)*a + 11880*(I*a*tan(d*x + c) + a)^(7/2)*a^2 - 22176*(I*a*tan(d*x + c)
+ a)^(5/2)*a^3 + 18480*(I*a*tan(d*x + c) + a)^(3/2)*a^4)/(a^9*d)
```

mupad [B] time = 7.63, size = 370, normalized size = 2.53

$$-\frac{\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,8192i}{3465\,a^4\,d}-\frac{\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,4096i}{3465\,a^4\,d\,\left(e^{c\,2i+d\,x\,2i}+1\right)}-\frac{\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1i}{e^{c\,2i+d\,x\,2i}+1}}\,1024i}{1155\,a^4\,d\,\left(e^{c\,2i+d\,x\,2i}+1\right)^2}-\frac{\sqrt{a-\frac{a\left(e^{c\,2i+d\,x\,2i}\,1i-i\right)1}{e^{c\,2i+d\,x\,2i}+1}}}{693\,a^4\,d\,\left(e^{c\,2i+d\,x\,2i}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^10*(a + a*tan(c + d*x)*1i)^(7/2)),x)
```

```
[Out] ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*6
4i)/(11*a^4*d*(exp(c*2i + d*x*2i) + 1)^5) - ((a - (a*(exp(c*2i + d*x*2i)*1i
 - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*4096i)/(3465*a^4*d*(exp(c*2i + d
*x*2i) + 1)) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i
) + 1))^(1/2)*1024i)/(1155*a^4*d*(exp(c*2i + d*x*2i) + 1)^2) - ((a - (a*(ex
p(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*512i)/(693*a^
4*d*(exp(c*2i + d*x*2i) + 1)^3) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)
/(exp(c*2i + d*x*2i) + 1))^(1/2)*64i)/(99*a^4*d*(exp(c*2i + d*x*2i) + 1)^4)
 - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2
)*8192i)/(3465*a^4*d)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**10/(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.379 $\int \frac{\sec^8(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=113

$$\frac{2i(a+ia\tan(c+dx))^{7/2}}{7a^7d}-\frac{12i(a+ia\tan(c+dx))^{5/2}}{5a^6d}+\frac{8i(a+ia\tan(c+dx))^{3/2}}{a^5d}-\frac{16i\sqrt{a+ia\tan(c+dx)}}{a^4d}$$

```
[Out] -16*I*(a+I*a*tan(d*x+c))^(1/2)/a^4/d+8*I*(a+I*a*tan(d*x+c))^(3/2)/a^5/d-12/
5*I*(a+I*a*tan(d*x+c))^(5/2)/a^6/d+2/7*I*(a+I*a*tan(d*x+c))^(7/2)/a^7/d
```

Rubi [A] time = 0.09, antiderivative size = 113, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 43}

$$\frac{2i(a+ia\tan(c+dx))^{7/2}}{7a^7d}-\frac{12i(a+ia\tan(c+dx))^{5/2}}{5a^6d}+\frac{8i(a+ia\tan(c+dx))^{3/2}}{a^5d}-\frac{16i\sqrt{a+ia\tan(c+dx)}}{a^4d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^8/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] ((-16*I)*Sqrt[a + I*a*Tan[c + d*x]])/(a^4*d) + ((8*I)*(a + I*a*Tan[c + d*x]
)^(3/2))/(a^5*d) - (((12*I)/5)*(a + I*a*Tan[c + d*x])^(5/2))/(a^6*d) + (((2
*I)/7)*(a + I*a*Tan[c + d*x])^(7/2))/(a^7*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^8(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{(a-x)^3}{\sqrt{a+x}}\,dx, x, ia\tan(c+dx)\right)}{a^7d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(\frac{8a^3}{\sqrt{a+x}}-12a^2\sqrt{a+x}+6a(a+x)^{3/2}-(a+x)^{5/2}\right)dx, x, ia\tan(c+dx)\right)}{a^7d}\\ &= -\frac{16i\sqrt{a+ia\tan(c+dx)}}{a^4d}+\frac{8i(a+ia\tan(c+dx))^{3/2}}{a^5d}-\frac{12i(a+ia\tan(c+dx))^{5/2}}{5a^6d}\end{aligned}$$

Mathematica [A] time = 0.68, size = 110, normalized size = 0.97

$$\frac{2\sec^7(c+dx)(-i(14\sin(c+dx)+19\sin(3(c+dx)))+126\cos(c+dx)+51\cos(3(c+dx)))(\cos(4(c+dx))+}{35a^3d(\tan(c+dx)-i)^3\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^8/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (2*Sec[c + d*x]^7*(126*Cos[c + d*x] + 51*Cos[3*(c + d*x)] - I*(14*Sin[c + d
*x] + 19*Sin[3*(c + d*x)]))*(Cos[4*(c + d*x)] + I*Sin[4*(c + d*x)]))/(35*a^
3*d*(-I + Tan[c + d*x])^3*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.68, size = 119, normalized size = 1.05

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(-256i\,e^{(7i\,dx+7i\,c)}-896i\,e^{(5i\,dx+5i\,c)}-1120i\,e^{(3i\,dx+3i\,c)}-560i\,e^{(i\,dx+i\,c)}\right)}{35\left(a^4de^{(6i\,dx+6i\,c)}+3\,a^4de^{(4i\,dx+4i\,c)}+3\,a^4de^{(2i\,dx+2i\,c)}+a^4d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/35*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-256*I*e^(7*I*d*x + 7*I*c)
- 896*I*e^(5*I*d*x + 5*I*c) - 1120*I*e^(3*I*d*x + 3*I*c) - 560*I*e^(I*d*x +
 I*c))/(a^4*d*e^(6*I*d*x + 6*I*c) + 3*a^4*d*e^(4*I*d*x + 4*I*c) + 3*a^4*d*e
^(2*I*d*x + 2*I*c) + a^4*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec\left(dx+c\right)^8}{\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^8/(I*a*tan(d*x + c) + a)^(7/2), x)
```

maple [A] time = 1.21, size = 90, normalized size = 0.80

$$-\frac{2\left(204i\left(\cos^3\left(dx+c\right)\right)+76\left(\cos^2\left(dx+c\right)\right)\sin\left(dx+c\right)-27i\cos\left(dx+c\right)-5\sin\left(dx+c\right)\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c)}{\cos(dx+c)}}}{35d\cos\left(dx+c\right)^3a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] -2/35/d*(204*I*cos(d*x+c)^3+76*cos(d*x+c)^2*sin(d*x+c)-27*I*cos(d*x+c)-5*si
n(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^3/a^4
```

maxima [A] time = 0.47, size = 76, normalized size = 0.67

$$\frac{2i\left(5\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{7}{2}}-42\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{5}{2}}a+140\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{3}{2}}a^2-280\sqrt{i\,a\tan\left(dx+c\right)+a}}{35\,a^7d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] 2/35*I*(5*(I*a*tan(d*x + c) + a)^(7/2) - 42*(I*a*tan(d*x + c) + a)^(5/2)*a
+ 140*(I*a*tan(d*x + c) + a)^(3/2)*a^2 - 280*sqrt(I*a*tan(d*x + c) + a)*a^3
)/(a^7*d)
```

mupad [B] time = 6.74, size = 242, normalized size = 2.14

$$-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,256\mathrm{i}}{35\,a^4\,d}-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,128\mathrm{i}}{35\,a^4\,d\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,96\mathrm{i}}{35\,a^4\,d\,{\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}^2}-\frac{\sqrt{a-\frac{a\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,16\mathrm{i}}{7\,a^4\,d\,{\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^8*(a + a*tan(c + d*x)*1i)^(7/2)),x)
```

```
[Out] - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)
*256i)/(35*a^4*d) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d
*x*2i) + 1))^(1/2)*128i)/(35*a^4*d*(exp(c*2i + d*x*2i) + 1)) - ((a - (a*(ex
p(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2)*96i)/(35*a^4*
d*(exp(c*2i + d*x*2i) + 1)^2) - ((a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(
exp(c*2i + d*x*2i) + 1))^(1/2)*16i)/(7*a^4*d*(exp(c*2i + d*x*2i) + 1)^3)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8/(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.380 $\int \frac{\sec^6(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=84

$$-\frac{2i(a+ia\tan(c+dx))^{3/2}}{3a^5d}+\frac{8i\sqrt{a+ia\tan(c+dx)}}{a^4d}+\frac{8i}{a^3d\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] 8*I/a^3/d/(a+I*a*tan(d*x+c))^(1/2)+8*I*(a+I*a*tan(d*x+c))^(1/2)/a^4/d-2/3*I
*(a+I*a*tan(d*x+c))^(3/2)/a^5/d
```

Rubi [A] time = 0.08, antiderivative size = 84, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 43}

$$-\frac{2i(a+ia\tan(c+dx))^{3/2}}{3a^5d}+\frac{8i\sqrt{a+ia\tan(c+dx)}}{a^4d}+\frac{8i}{a^3d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (8*I)/(a^3*d*Sqrt[a + I*a*Tan[c + d*x]]) + ((8*I)*Sqrt[a + I*a*Tan[c + d*x]
])/(a^4*d) - (((2*I)/3)*(a + I*a*Tan[c + d*x])^(3/2))/(a^5*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^6(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{(a-x)^2}{(a+x)^{3/2}}\,dx,x,ia\tan(c+dx)\right)}{a^5d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(\frac{4a^2}{(a+x)^{3/2}}-\frac{4a}{\sqrt{a+x}}+\sqrt{a+x}\right)dx,x,ia\tan(c+dx)\right)}{a^5d}\\ &= \frac{8i}{a^3d\sqrt{a+ia\tan(c+dx)}}+\frac{8i\sqrt{a+ia\tan(c+dx)}}{a^4d}-\frac{2i(a+ia\tan(c+dx))^{3/2}}{3a^5d}\end{aligned}$$

Mathematica [A] time = 0.49, size = 61, normalized size = 0.73

$$\frac{2i\sec^2(c+dx)(5i\sin(2(c+dx))+11\cos(2(c+dx))+12)}{3a^3d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((2*I)/3)*Sec[c + d*x]^2*(12 + 11*Cos[2*(c + d*x)] + (5*I)*Sin[2*(c + d*x)
]))/(a^3*d*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.59, size = 77, normalized size = 0.92

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(32i\,e^{(4i\,dx+4i\,c)}+48i\,e^{(2i\,dx+2i\,c)}+12i\right)}{3\left(a^4de^{(3i\,dx+3i\,c)}+a^4de^{(i\,dx+i\,c)}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/3*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(32*I*e^(4*I*d*x + 4*I*c) + 4
8*I*e^(2*I*d*x + 2*I*c) + 12*I)/(a^4*d*e^(3*I*d*x + 3*I*c) + a^4*d*e^(I*d*x
 + I*c))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec\left(dx+c\right)^{6}}{\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^6/(I*a*tan(d*x + c) + a)^(7/2), x)
```

maple [A] time = 1.18, size = 88, normalized size = 1.05

$$\frac{2\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(12i\left(\cos^{3}\left(dx+c\right)\right)+12\left(\cos^{2}\left(dx+c\right)\right)\sin\left(dx+c\right)+11i\cos\left(dx+c\right)+\sin\left(dx+c\right)\right)}{3d\cos\left(dx+c\right)a^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] 2/3/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(12*I*cos(d*x+c)^3+12*
cos(d*x+c)^2*sin(d*x+c)+11*I*cos(d*x+c)+sin(d*x+c))/cos(d*x+c)/a^4
```

maxima [A] time = 0.35, size = 62, normalized size = 0.74

$$\frac{2i\left(\frac{12}{\sqrt{i\,a\tan(dx+c)+a}\,a^{2}}-\frac{(i\,a\tan(dx+c)+a)^{\frac{3}{2}}-12\,\sqrt{i\,a\tan(dx+c)+a}\,a}{a^{4}}\right)}{3\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] 2/3*I*(12/(sqrt(I*a*tan(d*x + c) + a)*a^2) - ((I*a*tan(d*x + c) + a)^(3/2)
- 12*sqrt(I*a*tan(d*x + c) + a)*a)/a^4)/(a*d)
```

mupad [B] time = 0.74, size = 110, normalized size = 1.31

$$\frac{2\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}\,\left(\cos\left(2\,c+2\,d\,x\right)\,23\mathrm{i}+\cos\left(4\,c+4\,d\,x\right)\,3\mathrm{i}+7\,\sin\left(2\,c+2\,d\,x\right)+3\,\sin\left(4\,c+\right.\right.}{3\,a^4\,d\,\left(\cos\left(2\,c+2\,d\,x\right)+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^(7/2)),x)
```

```
[Out] (2*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1)
)^(1/2)*(cos(2*c + 2*d*x)*23i + cos(4*c + 4*d*x)*3i + 7*sin(2*c + 2*d*x) +
3*sin(4*c + 4*d*x) + 20i))/(3*a^4*d*(cos(2*c + 2*d*x) + 1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^6(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6/(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Integral(sec(c + d*x)**6/(I*a*(tan(c + d*x) - I))**(7/2), x)
```

3.381 $\int \frac{\sec^4(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=57

$$\frac{4i}{3a^2d(a+ia\tan(c+dx))^{3/2}}-\frac{2i}{a^3d\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] -2*I/a^3/d/(a+I*a*tan(d*x+c))^(1/2)+4/3*I/a^2/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.07, antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3487, 43}

$$\frac{4i}{3a^2d(a+ia\tan(c+dx))^{3/2}}-\frac{2i}{a^3d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] ((4*I)/3)/(a^2*d*(a + I*a*Tan[c + d*x])^(3/2)) - (2*I)/(a^3*d*Sqrt[a + I*a*
Tan[c + d*x]])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^4(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{a-x}{(a+x)^{5/2}}\,dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(\frac{2a}{(a+x)^{5/2}}-\frac{1}{(a+x)^{3/2}}\right)dx,x,ia\tan(c+dx)\right)}{a^3d}\\ &= \frac{4i}{3a^2d(a+ia\tan(c+dx))^{3/2}}-\frac{2i}{a^3d\sqrt{a+ia\tan(c+dx)}}\end{aligned}$$

Mathematica [A] time = 0.23, size = 80, normalized size = 1.40

$$\frac{2(1+3i\tan(c+dx))\sec^2(c+dx)(\cos(2(c+dx))+i\sin(2(c+dx)))}{3a^3d(\tan(c+dx)-i)^3\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (2*Sec[c + d*x]^2*(Cos[2*(c + d*x)] + I*Sin[2*(c + d*x)])*(1 + (3*I)*Tan[c
+ d*x]))/(3*a^3*d*(-I + Tan[c + d*x])^3*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.62, size = 61, normalized size = 1.07

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(-2i\,e^{(4i\,dx+4i\,c)}-i\,e^{(2i\,dx+2i\,c)}+i\right)e^{(-3i\,dx-3i\,c)}}{3\,a^{4}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/3*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-2*I*e^(4*I*d*x + 4*I*c) - I
*e^(2*I*d*x + 2*I*c) + I)*e^(-3*I*d*x - 3*I*c)/(a^4*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec\left(dx+c\right)^{4}}{\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^4/(I*a*tan(d*x + c) + a)^(7/2), x)
```

maple [A] time = 1.15, size = 88, normalized size = 1.54

$$\frac{2\cos\left(dx+c\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\,\left(4i\left(\cos^{3}\left(dx+c\right)\right)+4\left(\cos^{2}\left(dx+c\right)\right)\sin\left(dx+c\right)-5i\cos\left(dx+c\right)-3\sin\left(\right.\right.}{3d\,a^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] 2/3/d*cos(d*x+c)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(4*I*cos(d*
x+c)^3+4*cos(d*x+c)^2*sin(d*x+c)-5*I*cos(d*x+c)-3*sin(d*x+c))/a^4
```

maxima [A] time = 0.34, size = 32, normalized size = 0.56

$$-\frac{2i\left(3i\,a\tan\left(dx+c\right)+a\right)}{3\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{3}{2}}a^{3}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] -2/3*I*(3*I*a*tan(d*x + c) + a)/((I*a*tan(d*x + c) + a)^(3/2)*a^3*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{\cos\left(c+d\,x\right)^{4}\left(a+a\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)^{7/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^(7/2)),x)
```

```
[Out] int(1/(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^(7/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^4(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4/(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Integral(sec(c + d*x)**4/(I*a*(tan(c + d*x) - I))**(7/2), x)
```

3.382 $\int \frac{\sec^2(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=29

$$\frac{2i}{5ad(a+ia\tan(c+dx))^{5/2}}$$

[Out] 2/5*I/a/d/(a+I*a*tan(d*x+c))^(5/2)

Rubi [A] time = 0.06, antiderivative size = 29, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.077$, Rules used = {3487, 32}

$$\frac{2i}{5ad(a+ia\tan(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

[In] Int[Sec[c + d*x]^2/(a + I*a*Tan[c + d*x])^(7/2),x]

[Out] ((2*I)/5)/(a*d*(a + I*a*Tan[c + d*x])^(5/2))

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^2(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx &= -\frac{i\,\text{Subst}\left(\int \frac{1}{(a+x)^{7/2}}\,dx, x, ia\tan(c+dx)\right)}{ad}\\ &= \frac{2i}{5ad(a+ia\tan(c+dx))^{5/2}}\end{aligned}$$

Mathematica [A] time = 0.30, size = 39, normalized size = 1.34

$$-\frac{2\sqrt{a+ia\tan(c+dx)}}{5a^4d(\tan(c+dx)-i)^3}$$

Antiderivative was successfully verified.

[In] Integrate[Sec[c + d*x]^2/(a + I*a*Tan[c + d*x])^(7/2),x]

[Out] (-2*Sqrt[a + I*a*Tan[c + d*x]])/(5*a^4*d*(-I + Tan[c + d*x])^3)

fricas [B] time = 2.15, size = 72, normalized size = 2.48

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(i\,e^{(6i\,dx+6i\,c)}+3i\,e^{(4i\,dx+4i\,c)}+3i\,e^{(2i\,dx+2i\,c)}+i\right)e^{(-5i\,dx-5i\,c)}}{20\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/20*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(I*e^(6*I*d*x + 6*I*c) + 3*I
*e^(4*I*d*x + 4*I*c) + 3*I*e^(2*I*d*x + 2*I*c) + I)*e^(-5*I*d*x - 5*I*c)/(a
^4*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec (dx + c)^2}{(i\,a\tan (dx + c) + a)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^2/(I*a*tan(d*x + c) + a)^(7/2), x)
```

maple [A] time = 0.18, size = 24, normalized size = 0.83

$$\frac{2i}{5ad\,(a + ia\tan (dx + c))^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] 2/5*I/a/d/(a+I*a*tan(d*x+c))^(5/2)
```

maxima [A] time = 0.32, size = 21, normalized size = 0.72

$$\frac{2i}{5\,(i\,a\tan (dx + c) + a)^{\frac{5}{2}}ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] 2/5*I/((I*a*tan(d*x + c) + a)^(5/2)*a*d)
```

mupad [B] time = 3.64, size = 23, normalized size = 0.79

$$\frac{2\mathrm{i}}{5\,a\,d\,(a + a\tan (c + d\,x)\,1\mathrm{i})^{5/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^(7/2)),x)
```

```
[Out] 2i/(5*a*d*(a + a*tan(c + d*x)*1i)^(5/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^2 (c + dx)}{(ia\,(\tan (c + dx) - i))^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2/(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Integral(sec(c + d*x)**2/(I*a*(tan(c + d*x) - I))**(7/2), x)
```

3.383 $\int \frac{\cos^2(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=233

$$-\frac{11i\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{64\sqrt{2}a^{7/2}d}+\frac{11i}{64a^3d\sqrt{a+ia\tan(c+dx)}}-\frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{9/2}}+\frac{}{96a^2d(a}$$

```
[Out] -11/128*I*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))/a^(7/2)/d*2
^(1/2)+11/64*I/a^3/d/(a+I*a*tan(d*x+c))^(1/2)+11/36*I*a/d/(a+I*a*tan(d*x+c)
)^(9/2)-1/2*I*a^2/d/(a-I*a*tan(d*x+c))/(a+I*a*tan(d*x+c))^(9/2)+11/56*I/d/(
a+I*a*tan(d*x+c))^(7/2)+11/80*I/a/d/(a+I*a*tan(d*x+c))^(5/2)+11/96*I/a^2/d/
(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.14, antiderivative size = 233, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {3487, 51, 63, 206}

$$-\frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{9/2}}+\frac{11i}{96a^2d(a+ia\tan(c+dx))^{3/2}}+\frac{11i}{64a^3d\sqrt{a+ia\tan(c+dx)}}-\frac{11i\tanh}{}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((-11*I)/64)*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a])])/(Sqrt[
2]*a^(7/2)*d) + (((11*I)/36)*a)/(d*(a + I*a*Tan[c + d*x])^(9/2)) - ((I/2)*a
^2)/(d*(a - I*a*Tan[c + d*x])*(a + I*a*Tan[c + d*x])^(9/2)) + ((11*I)/56)/(
d*(a + I*a*Tan[c + d*x])^(7/2)) + ((11*I)/80)/(a*d*(a + I*a*Tan[c + d*x])^(
5/2)) + ((11*I)/96)/(a^2*d*(a + I*a*Tan[c + d*x])^(3/2)) + ((11*I)/64)/(a^3
*d*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
```

```
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^2(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx = -\frac{(ia^3)\,\text{Subst}\left(\int \frac{1}{(a-x)^2(a+x)^{11/2}}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{9/2}} - \frac{(11ia^2)\,\text{Subst}\left(\int \frac{1}{(a-x)(a+x)^{11/2}}\,d\right.}{4d}$$

$$= \frac{11ia}{36d(a+ia\tan(c+dx))^{9/2}} - \frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{9/2}} - \frac{(11}{}$$

$$= \frac{11ia}{36d(a+ia\tan(c+dx))^{9/2}} - \frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{9/2}} + \frac{}{56a}$$

$$= \frac{11ia}{36d(a+ia\tan(c+dx))^{9/2}} - \frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{9/2}} + \frac{}{56a}$$

$$= \frac{11ia}{36d(a+ia\tan(c+dx))^{9/2}} - \frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{9/2}} + \frac{}{56a}$$

$$= \frac{11ia}{36d(a+ia\tan(c+dx))^{9/2}} - \frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{9/2}} + \frac{}{56a}$$

$$= \frac{11ia}{36d(a+ia\tan(c+dx))^{9/2}} - \frac{ia^2}{2d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{9/2}} + \frac{}{56a}$$

$$= -\frac{11i\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{64\sqrt{2}\,a^{7/2}d} + \frac{11ia}{36d(a+ia\tan(c+dx))^{9/2}} - \frac{}{2d(a-ia\tan(c+d}$$

Mathematica [A] time = 1.71, size = 176, normalized size = 0.76

$$-\frac{ie^{-11i(c+dx)}\left(1+e^{2i(c+dx)}\right)^{5/2}\sec^3(c+dx)\left(\sqrt{1+e^{2i(c+dx)}}\left(-460e^{2i(c+dx)}-1338e^{4i(c+dx)}-2416e^{6i(c+dx)}-4618e^{8i}\right.\right.}{161280a^3d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] ((-1/161280*I)*(1 + E^((2*I)*(c + d*x)))^(5/2)*(Sqrt[1 + E^((2*I)*(c + d*x)
)]*(-70 - 460*E^((2*I)*(c + d*x)) - 1338*E^((4*I)*(c + d*x)) - 2416*E^((6*I
)*(c + d*x)) - 4618*E^((8*I)*(c + d*x)) + 315*E^((10*I)*(c + d*x))) + 3465*
E^((9*I)*(c + d*x))*ArcSinh[E^(I*(c + d*x))])*Sec[c + d*x]^3)/(a^3*d*E^((11
*I)*(c + d*x))*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.52, size = 316, normalized size = 1.36

$$\frac{\left(-3465i\sqrt{\frac{1}{2}}\,a^4d\sqrt{\frac{1}{a^7d^2}}\,e^{(9idx+9ic)}\log\left(4\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(a^4de^{(2idx+2ic)}+a^4d\right)\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\sqrt{\frac{1}{a^7d^2}}+ae^{(idx+ic)}\right)e^{(-idx-ic)}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/40320*(-3465*I*sqrt(1/2)*a^4*d*sqrt(1/(a^7*d^2))*e^(9*I*d*x + 9*I*c)*log(
4*(sqrt(2)*sqrt(1/2)*(a^4*d*e^(2*I*d*x + 2*I*c) + a^4*d)*sqrt(a/(e^(2*I*d*x
 + 2*I*c) + 1))*sqrt(1/(a^7*d^2)) + a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) +
3465*I*sqrt(1/2)*a^4*d*sqrt(1/(a^7*d^2))*e^(9*I*d*x + 9*I*c)*log(-4*(sqrt(2
)*sqrt(1/2)*(a^4*d*e^(2*I*d*x + 2*I*c) + a^4*d)*sqrt(a/(e^(2*I*d*x + 2*I*c)
 + 1))*sqrt(1/(a^7*d^2)) - a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) + sqrt(2)*s
qrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-315*I*e^(12*I*d*x + 12*I*c) + 4303*I*e^(
10*I*d*x + 10*I*c) + 7034*I*e^(8*I*d*x + 8*I*c) + 3754*I*e^(6*I*d*x + 6*I*c
) + 1798*I*e^(4*I*d*x + 4*I*c) + 530*I*e^(2*I*d*x + 2*I*c) + 70*I))*e^(-9*I
*d*x - 9*I*c)/(a^4*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos(dx+c)^2}{(i a \tan(dx+c)+a)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate(cos(d*x + c)^2/(I*a*tan(d*x + c) + a)^(7/2), x)
```

maple [B] time = 1.24, size = 422, normalized size = 1.81

$$\frac{\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(71680i\left(\cos^{10}(dx+c)\right)+71680\sin(dx+c)\left(\cos^{9}(dx+c)\right)-43520i\left(\cos^{8}(dx+c)\right)-76\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] 1/80640/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(71680*I*cos(d*x+c
)^10+71680*sin(d*x+c)*cos(d*x+c)^9-43520*I*cos(d*x+c)^8-7680*sin(d*x+c)*cos
(d*x+c)^7+512*I*cos(d*x+c)^6+5632*cos(d*x+c)^5*sin(d*x+c)+3465*I*2^(1/2)*co
s(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I-si
n(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))+1056*I*c
os(d*x+c)^4+3465*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)*arctan(1/2*
(I*cos(d*x+c)-I-sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*2^(1/2))+3465*arctan(1/2*(I*cos(d*x+c)-I-sin(d*x+c))/sin(d*x+c)/(-2*cos(d*
x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*sin(d*x+c)*2^(1/2)*(-2*cos(d*x+c)/(1+co
s(d*x+c)))^(1/2)+7392*cos(d*x+c)^3*sin(d*x+c)+4620*I*cos(d*x+c)^2+13860*cos
(d*x+c)*sin(d*x+c))/a^4
```

maxima [A] time = 0.59, size = 195, normalized size = 0.84

$$\frac{i\left(\frac{4\left(3465\,(i a\tan(dx+c)+a)^{5}-4620\,(i a\tan(dx+c)+a)^{4}a-1848\,(i a\tan(dx+c)+a)^{3}a^{2}-1584\,(i a\tan(dx+c)+a)^{2}a^{3}-1760\,(i a\tan(dx+c)+a)a^{4}-2240\,a^{5}\right)}{(i a\tan(dx+c)+a)^{\frac{11}{2}}a^{2}-2\,(i a\tan(dx+c)+a)^{\frac{9}{2}}a^{3}}+\right.}{80640\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] 1/80640*I*(4*(3465*(I*a*tan(d*x + c) + a)^5 - 4620*(I*a*tan(d*x + c) + a)^4
*a - 1848*(I*a*tan(d*x + c) + a)^3*a^2 - 1584*(I*a*tan(d*x + c) + a)^2*a^3
- 1760*(I*a*tan(d*x + c) + a)*a^4 - 2240*a^5)/((I*a*tan(d*x + c) + a)^(11/2
```

```
)*a^2 - 2*(I*a*tan(d*x + c) + a)^(9/2)*a^3) + 3465*sqrt(2)*log(-(sqrt(2)*sq
rt(a) - sqrt(I*a*tan(d*x + c) + a))/(sqrt(2)*sqrt(a) + sqrt(I*a*tan(d*x + c
) + a)))/a^(5/2))/(a*d)
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\cos\left(c+d\,x\right)^2}{{\left(a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^{7/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2/(a + a*tan(c + d*x)*1i)^(7/2),x)
```

```
[Out] int(cos(c + d*x)^2/(a + a*tan(c + d*x)*1i)^(7/2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2/(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.384 $\int \frac{\cos^4(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=306

$$-\frac{195i\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{1024\sqrt{2}a^{7/2}d}-\frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{11/2}}-\frac{15ia^3}{16d(a-ia\tan(c+dx))(a+ia\tan$$

```
[Out] -195/2048*I*arctanh(1/2*(a+I*a*tan(d*x+c))^(1/2)*2^(1/2)/a^(1/2))/a^(7/2)/d
*2^(1/2)+195/1024*I/a^3/d/(a+I*a*tan(d*x+c))^(1/2)+195/352*I*a^2/d/(a+I*a*t
an(d*x+c))^(11/2)-1/4*I*a^4/d/(a-I*a*tan(d*x+c))^2/(a+I*a*tan(d*x+c))^(11/2
)-15/16*I*a^3/d/(a-I*a*tan(d*x+c))/(a+I*a*tan(d*x+c))^(11/2)+65/192*I*a/d/(
a+I*a*tan(d*x+c))^(9/2)+195/896*I/d/(a+I*a*tan(d*x+c))^(7/2)+39/256*I/a/d/(
a+I*a*tan(d*x+c))^(5/2)+65/512*I/a^2/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.18, antiderivative size = 306, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3487, 51, 63, 206}

$$-\frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{11/2}}-\frac{15ia^3}{16d(a-ia\tan(c+dx))(a+ia\tan(c+dx))^{11/2}}+\frac{195ia}{352d(a+ia\tan$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((-195*I)/1024)*ArcTanh[Sqrt[a + I*a*Tan[c + d*x]]/(Sqrt[2]*Sqrt[a])])/(Sq
rt[2]*a^(7/2)*d) + (((195*I)/352)*a^2)/(d*(a + I*a*Tan[c + d*x])^(11/2)) -
((I/4)*a^4)/(d*(a - I*a*Tan[c + d*x])^2*(a + I*a*Tan[c + d*x])^(11/2)) - ((
(15*I)/16)*a^3)/(d*(a - I*a*Tan[c + d*x])*(a + I*a*Tan[c + d*x])^(11/2)) +
(((65*I)/192)*a)/(d*(a + I*a*Tan[c + d*x])^(9/2)) + ((195*I)/896)/(d*(a + I
*a*Tan[c + d*x])^(7/2)) + ((39*I)/256)/(a*d*(a + I*a*Tan[c + d*x])^(5/2)) +
 ((65*I)/512)/(a^2*d*(a + I*a*Tan[c + d*x])^(3/2)) + ((195*I)/1024)/(a^3*d*
Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^4(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx = -\frac{(ia^5)\,\text{Subst}\left(\int \frac{1}{(a-x)^3(a+x)^{13/2}}\,dx, x, ia\tan(c+dx)\right)}{d}$$

$$= -\frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{11/2}} - \frac{(15ia^4)\,\text{Subst}\left(\int \frac{1}{(a-x)^2(a+x)^{13}}\right.}{8d}$$

$$= -\frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{11/2}} - \frac{15ia^3}{16d(a-ia\tan(c+dx))(a+i}$$

$$= \frac{195ia^2}{352d(a+ia\tan(c+dx))^{11/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{11/2}} -$$

$$= \frac{195ia^2}{352d(a+ia\tan(c+dx))^{11/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{11/2}} -$$

$$= \frac{195ia^2}{352d(a+ia\tan(c+dx))^{11/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{11/2}} -$$

$$= \frac{195ia^2}{352d(a+ia\tan(c+dx))^{11/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{11/2}} -$$

$$= \frac{195ia^2}{352d(a+ia\tan(c+dx))^{11/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{11/2}} -$$

$$= \frac{195ia^2}{352d(a+ia\tan(c+dx))^{11/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{11/2}} -$$

$$= \frac{195ia^2}{352d(a+ia\tan(c+dx))^{11/2}} - \frac{ia^4}{4d(a-ia\tan(c+dx))^2(a+ia\tan(c+dx))^{11/2}} -$$

$$= -\frac{195i\tanh^{-1}\left(\frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{2}\sqrt{a}}\right)}{1024\sqrt{2}\,a^{7/2}d} + \frac{195ia^2}{352d(a+ia\tan(c+dx))^{11/2}} - \frac{}{4d(a-ia\tan(c}$$

Mathematica [A] time = 2.42, size = 202, normalized size = 0.66

$$-\frac{ie^{-13i(c+dx)}\left(1+e^{2i(c+dx)}\right)^{5/2}\sec^3(c+dx)\left(\sqrt{1+e^{2i(c+dx)}}\left(-1456e^{2i(c+dx)}-5728e^{4i(c+dx)}-13824e^{6i(c+dx)}-2468\right.\right.}{1892352a^3d\sqrt{a+ia\,t}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] ((-1/1892352*I)*(1 + E^((2*I)*(c + d*x)))^(5/2)*(Sqrt[1 + E^((2*I)*(c + d*x
))]*(-168 - 1456*E^((2*I)*(c + d*x)) - 5728*E^((4*I)*(c + d*x)) - 13824*E^(
(6*I)*(c + d*x)) - 24688*E^((8*I)*(c + d*x)) - 54112*E^((10*I)*(c + d*x)) +
 6699*E^((12*I)*(c + d*x)) + 462*E^((14*I)*(c + d*x))) + 45045*E^((11*I)*(c
 + d*x))*ArcSinh[E^(I*(c + d*x))])*Sec[c + d*x]^3)/(a^3*d*E^((13*I)*(c + d*
x))*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.68, size = 338, normalized size = 1.10

$$\left(-45045i\sqrt{\frac{1}{2}}a^4d\sqrt{\frac{1}{a^7d^2}}e^{(11idx+11ic)}\log\left(4\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(a^4de^{(2idx+2ic)}+a^4d\right)\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\sqrt{\frac{1}{a^7d^2}}+ae^{(idx+ic)}\right)e^{(-idx-ic)}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/473088*(-45045*I*sqrt(1/2)*a^4*d*sqrt(1/(a^7*d^2))*e^(11*I*d*x + 11*I*c)*
log(4*(sqrt(2)*sqrt(1/2)*(a^4*d*e^(2*I*d*x + 2*I*c) + a^4*d)*sqrt(a/(e^(2*I
*d*x + 2*I*c) + 1))*sqrt(1/(a^7*d^2)) + a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)
) + 45045*I*sqrt(1/2)*a^4*d*sqrt(1/(a^7*d^2))*e^(11*I*d*x + 11*I*c)*log(-4*
(sqrt(2)*sqrt(1/2)*(a^4*d*e^(2*I*d*x + 2*I*c) + a^4*d)*sqrt(a/(e^(2*I*d*x +
 2*I*c) + 1))*sqrt(1/(a^7*d^2)) - a*e^(I*d*x + I*c))*e^(-I*d*x - I*c)) + sq
rt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(-462*I*e^(16*I*d*x + 16*I*c) - 716
1*I*e^(14*I*d*x + 14*I*c) + 47413*I*e^(12*I*d*x + 12*I*c) + 78800*I*e^(10*I
*d*x + 10*I*c) + 38512*I*e^(8*I*d*x + 8*I*c) + 19552*I*e^(6*I*d*x + 6*I*c)
+ 7184*I*e^(4*I*d*x + 4*I*c) + 1624*I*e^(2*I*d*x + 2*I*c) + 168*I))*e^(-11*
I*d*x - 11*I*c)/(a^4*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos(dx+c)^4}{(ia\tan(dx+c)+a)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate(cos(d*x + c)^4/(I*a*tan(d*x + c) + a)^(7/2), x)
```

maple [A] time = 1.70, size = 449, normalized size = 1.47

$$\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(688128i\left(\cos^{12}(dx+c)\right)+688128\sin(dx+c)\left(\cos^{11}(dx+c)\right)-401408i\left(\cos^{10}(dx+c)\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] 1/946176/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(688128*I*cos(d*x
+c)^12+688128*sin(d*x+c)*cos(d*x+c)^11-401408*I*cos(d*x+c)^10-57344*sin(d*x
+c)*cos(d*x+c)^9+4096*I*cos(d*x+c)^8+61440*sin(d*x+c)*cos(d*x+c)^7+6656*I*c
os(d*x+c)^6+73216*cos(d*x+c)^5*sin(d*x+c)+13728*I*cos(d*x+c)^4+45045*I*(-2*
cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)*arctan(1/2*(I*cos(d*x+c)-I-sin(
d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)+45
045*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)*arctan(1/2*(I*cos(d*x+c)
-I-sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))+960
96*cos(d*x+c)^3*sin(d*x+c)+45045*arctan(1/2*(I*cos(d*x+c)-I-sin(d*x+c))/sin
(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*sin(d*x+c)*2^(1/2)*(-
2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)+60060*I*cos(d*x+c)^2+180180*cos(d*x+c)*s
in(d*x+c))/a^4
```

maxima [A] time = 1.01, size = 249, normalized size = 0.81

$$\frac{i\left(\frac{4\left(45045(ia\tan(dx+c)+a)^7-150150(ia\tan(dx+c)+a)^6a+96096(ia\tan(dx+c)+a)^5a^2+27456(ia\tan(dx+c)+a)^4a^3+18304(ia\tan(dx+c)+a)^3a^4+166\right.}{(ia\tan(dx+c)+a)^{\frac{15}{2}}a^2-4(ia\tan(dx+c)+a)^{\frac{13}{2}}a^3+4(ia\tan(dx+c)+a)^{\frac{11}{2}}a^4}\right.}{946176\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] 1/946176*I*(4*(45045*(I*a*tan(d*x + c) + a)^7 - 150150*(I*a*tan(d*x + c) +
a)^6*a + 96096*(I*a*tan(d*x + c) + a)^5*a^2 + 27456*(I*a*tan(d*x + c) + a)^
4*a^3 + 18304*(I*a*tan(d*x + c) + a)^3*a^4 + 16640*(I*a*tan(d*x + c) + a)^2
*a^5 + 17920*(I*a*tan(d*x + c) + a)*a^6 + 21504*a^7)/((I*a*tan(d*x + c) + a
)^(15/2)*a^2 - 4*(I*a*tan(d*x + c) + a)^(13/2)*a^3 + 4*(I*a*tan(d*x + c) +
a)^(11/2)*a^4) + 45045*sqrt(2)*log(-(sqrt(2)*sqrt(a) - sqrt(I*a*tan(d*x + c
) + a))/(sqrt(2)*sqrt(a) + sqrt(I*a*tan(d*x + c) + a)))/a^(5/2))/(a*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\cos(c+d\,x)^4}{(a+a\tan(c+d\,x)\,1\mathrm{i})^{7/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4/(a + a*tan(c + d*x)*1i)^(7/2),x)
```

```
[Out] int(cos(c + d*x)^4/(a + a*tan(c + d*x)*1i)^(7/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4/(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.385 $\int \frac{\sec^{13}(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=110

$$\frac{64ia^3\sec^{13}(c+dx)}{3315d(a+ia\tan(c+dx))^{13/2}}+\frac{16ia^2\sec^{13}(c+dx)}{255d(a+ia\tan(c+dx))^{11/2}}+\frac{2ia\sec^{13}(c+dx)}{17d(a+ia\tan(c+dx))^{9/2}}$$

```
[Out] 64/3315*I*a^3*sec(d*x+c)^13/d/(a+I*a*tan(d*x+c))^(13/2)+16/255*I*a^2*sec(d*
x+c)^13/d/(a+I*a*tan(d*x+c))^(11/2)+2/17*I*a*sec(d*x+c)^13/d/(a+I*a*tan(d*x
+c))^(9/2)
```

Rubi [A] time = 0.19, antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3494, 3493}

$$\frac{16ia^2\sec^{13}(c+dx)}{255d(a+ia\tan(c+dx))^{11/2}}+\frac{64ia^3\sec^{13}(c+dx)}{3315d(a+ia\tan(c+dx))^{13/2}}+\frac{2ia\sec^{13}(c+dx)}{17d(a+ia\tan(c+dx))^{9/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^13/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((64*I)/3315)*a^3*Sec[c + d*x]^13)/(d*(a + I*a*Tan[c + d*x])^(13/2)) + (((
16*I)/255)*a^2*Sec[c + d*x]^13)/(d*(a + I*a*Tan[c + d*x])^(11/2)) + (((2*I)
/17)*a*Sec[c + d*x]^13)/(d*(a + I*a*Tan[c + d*x])^(9/2))
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^{13}(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx &= \frac{2ia\sec^{13}(c+dx)}{17d(a+ia\tan(c+dx))^{9/2}}+\frac{1}{17}(8a)\int \frac{\sec^{13}(c+dx)}{(a+ia\tan(c+dx))^{9/2}}\,dx\\ &= \frac{16ia^2\sec^{13}(c+dx)}{255d(a+ia\tan(c+dx))^{11/2}}+\frac{2ia\sec^{13}(c+dx)}{17d(a+ia\tan(c+dx))^{9/2}}+\frac{1}{255}\left(32a^2\right)\int \frac{\text{se}}{(a+ia}\\ &= \frac{64ia^3\sec^{13}(c+dx)}{3315d(a+ia\tan(c+dx))^{13/2}}+\frac{16ia^2\sec^{13}(c+dx)}{255d(a+ia\tan(c+dx))^{11/2}}+\frac{2ia\sec^{13}(c+}{17d(a+ia\tan(c+}\end{aligned}$$

Mathematica [A] time = 1.10, size = 92, normalized size = 0.84

$$-\frac{2\sec^{12}(c+dx)(247i\sin(2(c+dx))+263\cos(2(c+dx))+68)(\cos(3(c+dx))-i\sin(3(c+dx)))}{3315a^3d(\tan(c+dx)-i)^3\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^13/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (-2*Sec[c + d*x]^12*(68 + 263*Cos[2*(c + d*x)] + (247*I)*Sin[2*(c + d*x)])*
(Cos[3*(c + d*x)] - I*Sin[3*(c + d*x)]))/(3315*a^3*d*(-I + Tan[c + d*x])^3*
Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [B] time = 0.87, size = 173, normalized size = 1.57

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(130560i\,e^{(4i\,dx+4i\,c)}+34816i\,e^{(2i\,dx+2i\,c)}+409\right.}{3315\left(a^4de^{(16i\,dx+16i\,c)}+8\,a^4de^{(14i\,dx+14i\,c)}+28\,a^4de^{(12i\,dx+12i\,c)}+56\,a^4de^{(10i\,dx+10i\,c)}+70\,a^4de^{(8i\,dx+8i\,c)}+56\,a^4de\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^13/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/3315*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(130560*I*e^(4*I*d*x + 4*I
*c) + 34816*I*e^(2*I*d*x + 2*I*c) + 4096*I)/(a^4*d*e^(16*I*d*x + 16*I*c) +
8*a^4*d*e^(14*I*d*x + 14*I*c) + 28*a^4*d*e^(12*I*d*x + 12*I*c) + 56*a^4*d*e
^(10*I*d*x + 10*I*c) + 70*a^4*d*e^(8*I*d*x + 8*I*c) + 56*a^4*d*e^(6*I*d*x +
 6*I*c) + 28*a^4*d*e^(4*I*d*x + 4*I*c) + 8*a^4*d*e^(2*I*d*x + 2*I*c) + a^4*
d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec\left(dx+c\right)^{13}}{\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^13/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^13/(I*a*tan(d*x + c) + a)^(7/2), x)
```

maple [A] time = 6.86, size = 171, normalized size = 1.55

$$\frac{2\left(2048i\left(\cos^{9}\left(dx+c\right)\right)+2048\sin\left(dx+c\right)\left(\cos^{8}\left(dx+c\right)\right)-256i\left(\cos^{7}\left(dx+c\right)\right)+768\sin\left(dx+c\right)\left(\cos^{6}\left(dx\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^13/(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] 2/3315/d*(2048*I*cos(d*x+c)^9+2048*sin(d*x+c)*cos(d*x+c)^8-256*I*cos(d*x+c)
^7+768*sin(d*x+c)*cos(d*x+c)^6-80*I*cos(d*x+c)^5+560*sin(d*x+c)*cos(d*x+c)^
4-2252*I*cos(d*x+c)^3-1748*cos(d*x+c)^2*sin(d*x+c)+871*I*cos(d*x+c)+195*sin
(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^8/a^4
```

maxima [B] time = 1.08, size = 902, normalized size = 8.20

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^13/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] -2/3315*(-331*I*sqrt(a) - 998*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) - 183
8*I*sqrt(a)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 7522*sqrt(a)*sin(d*x + c)
^3/(cos(d*x + c) + 1)^3 - 4836*I*sqrt(a)*sin(d*x + c)^4/(cos(d*x + c) + 1)^
```

```
4 - 27882*sqrt(a)*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 8954*I*sqrt(a)*sin(
d*x + c)^6/(cos(d*x + c) + 1)^6 - 68926*sqrt(a)*sin(d*x + c)^7/(cos(d*x + c
) + 1)^7 - 12631*I*sqrt(a)*sin(d*x + c)^8/(cos(d*x + c) + 1)^8 - 125052*sqr
t(a)*sin(d*x + c)^9/(cos(d*x + c) + 1)^9 - 10540*I*sqrt(a)*sin(d*x + c)^10/
(cos(d*x + c) + 1)^10 - 168980*sqrt(a)*sin(d*x + c)^11/(cos(d*x + c) + 1)^1
1 - 168980*sqrt(a)*sin(d*x + c)^13/(cos(d*x + c) + 1)^13 + 10540*I*sqrt(a)*
sin(d*x + c)^14/(cos(d*x + c) + 1)^14 - 125052*sqrt(a)*sin(d*x + c)^15/(cos
(d*x + c) + 1)^15 + 12631*I*sqrt(a)*sin(d*x + c)^16/(cos(d*x + c) + 1)^16 -
 68926*sqrt(a)*sin(d*x + c)^17/(cos(d*x + c) + 1)^17 + 8954*I*sqrt(a)*sin(d
*x + c)^18/(cos(d*x + c) + 1)^18 - 27882*sqrt(a)*sin(d*x + c)^19/(cos(d*x +
 c) + 1)^19 + 4836*I*sqrt(a)*sin(d*x + c)^20/(cos(d*x + c) + 1)^20 - 7522*s
qrt(a)*sin(d*x + c)^21/(cos(d*x + c) + 1)^21 + 1838*I*sqrt(a)*sin(d*x + c)^
22/(cos(d*x + c) + 1)^22 - 998*sqrt(a)*sin(d*x + c)^23/(cos(d*x + c) + 1)^2
3 + 331*I*sqrt(a)*sin(d*x + c)^24/(cos(d*x + c) + 1)^24)*(sin(d*x + c)/(cos
(d*x + c) + 1) + 1)^(7/2)*(sin(d*x + c)/(cos(d*x + c) + 1) - 1)^(7/2)/((a^4
 - 12*a^4*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 66*a^4*sin(d*x + c)^4/(cos(
d*x + c) + 1)^4 - 220*a^4*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 + 495*a^4*sin
(d*x + c)^8/(cos(d*x + c) + 1)^8 - 792*a^4*sin(d*x + c)^10/(cos(d*x + c) +
1)^10 + 924*a^4*sin(d*x + c)^12/(cos(d*x + c) + 1)^12 - 792*a^4*sin(d*x + c
)^14/(cos(d*x + c) + 1)^14 + 495*a^4*sin(d*x + c)^16/(cos(d*x + c) + 1)^16
- 220*a^4*sin(d*x + c)^18/(cos(d*x + c) + 1)^18 + 66*a^4*sin(d*x + c)^20/(c
os(d*x + c) + 1)^20 - 12*a^4*sin(d*x + c)^22/(cos(d*x + c) + 1)^22 + a^4*si
n(d*x + c)^24/(cos(d*x + c) + 1)^24)*d*(-2*I*sin(d*x + c)/(cos(d*x + c) + 1
) + sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 1)^(7/2))
```

mupad [B] time = 9.28, size = 105, normalized size = 0.95

$$\frac{512\,\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\,\sqrt{a-\frac{a\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)\,1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,68\mathrm{i}+\mathrm{e}^{c\,4\mathrm{i}+d\,x\,4\mathrm{i}}\,255\mathrm{i}+8\mathrm{i}\right)}{3315\,a^4\,d\,{\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)}^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^13*(a + a*tan(c + d*x)*1i)^(7/2)),x)
```

```
[Out] (512*exp(- c*1i - d*x*1i)*(a - (a*(exp(c*2i + d*x*2i)*1i - 1i)*1i)/(exp(c*2
i + d*x*2i) + 1))^(1/2)*(exp(c*2i + d*x*2i)*68i + exp(c*4i + d*x*4i)*255i +
 8i))/(3315*a^4*d*(exp(c*2i + d*x*2i) + 1)^8)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**13/(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.386 $\int \frac{\sec^{11}(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=73

$$\frac{8ia^2\sec^{11}(c+dx)}{143d(a+ia\tan(c+dx))^{11/2}}+\frac{2ia\sec^{11}(c+dx)}{13d(a+ia\tan(c+dx))^{9/2}}$$

```
[Out] 8/143*I*a^2*sec(d*x+c)^11/d/(a+I*a*tan(d*x+c))^(11/2)+2/13*I*a*sec(d*x+c)^1
1/d/(a+I*a*tan(d*x+c))^(9/2)
```

Rubi [A] time = 0.13, antiderivative size = 73, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.077, Rules used = {3494, 3493}

$$\frac{8ia^2\sec^{11}(c+dx)}{143d(a+ia\tan(c+dx))^{11/2}}+\frac{2ia\sec^{11}(c+dx)}{13d(a+ia\tan(c+dx))^{9/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^11/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((8*I)/143)*a^2*Sec[c + d*x]^11)/(d*(a + I*a*Tan[c + d*x])^(11/2)) + (((2*
I)/13)*a*Sec[c + d*x]^11)/(d*(a + I*a*Tan[c + d*x])^(9/2))
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^{11}(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx &= \frac{2ia\sec^{11}(c+dx)}{13d(a+ia\tan(c+dx))^{9/2}}+\frac{1}{13}(4a)\int \frac{\sec^{11}(c+dx)}{(a+ia\tan(c+dx))^{9/2}}\,dx\\ &= \frac{8ia^2\sec^{11}(c+dx)}{143d(a+ia\tan(c+dx))^{11/2}}+\frac{2ia\sec^{11}(c+dx)}{13d(a+ia\tan(c+dx))^{9/2}}\end{aligned}$$

Mathematica [A] time = 0.60, size = 82, normalized size = 1.12

$$-\frac{2i(11\tan(c+dx)-15i)\sec^9(c+dx)(\cos(2(c+dx))-i\sin(2(c+dx)))}{143a^3d(\tan(c+dx)-i)^3\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^11/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((-2*I)/143)*Sec[c + d*x]^9*(Cos[2*(c + d*x)] - I*Sin[2*(c + d*x)])*(-15*I
 + 11*Tan[c + d*x]))/(a^3*d*(-I + Tan[c + d*x])^3*Sqrt[a + I*a*Tan[c + d*x]
])
```

fricas [B] time = 0.67, size = 132, normalized size = 1.81

$$\frac{\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(1664i\,e^{(2i\,dx+2i\,c)}+256i\right)}{143\left(a^4de^{(12i\,dx+12i\,c)}+6\,a^4de^{(10i\,dx+10i\,c)}+15\,a^4de^{(8i\,dx+8i\,c)}+20\,a^4de^{(6i\,dx+6i\,c)}+15\,a^4de^{(4i\,dx+4i\,c)}+6\,a^4de^{(2i\,dx+2i\,c)}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^11/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/143*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(1664*I*e^(2*I*d*x + 2*I*c)
 + 256*I)/(a^4*d*e^(12*I*d*x + 12*I*c) + 6*a^4*d*e^(10*I*d*x + 10*I*c) + 15
*a^4*d*e^(8*I*d*x + 8*I*c) + 20*a^4*d*e^(6*I*d*x + 6*I*c) + 15*a^4*d*e^(4*I
*d*x + 4*I*c) + 6*a^4*d*e^(2*I*d*x + 2*I*c) + a^4*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)^{11}}{(i\,a\tan(dx+c)+a)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^11/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^11/(I*a*tan(d*x + c) + a)^(7/2), x)
```

maple [B] time = 1.78, size = 144, normalized size = 1.97

$$\frac{2\left(128i\left(\cos^7(dx+c)\right)+128\sin(dx+c)\left(\cos^6(dx+c)\right)-16i\left(\cos^5(dx+c)\right)+48\sin(dx+c)\left(\cos^4(dx+c)\right)-1\right.}{143d\cos(d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^11/(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] 2/143/d*(128*I*cos(d*x+c)^7+128*sin(d*x+c)*cos(d*x+c)^6-16*I*cos(d*x+c)^5+4
8*sin(d*x+c)*cos(d*x+c)^4-148*I*cos(d*x+c)^3-108*cos(d*x+c)^2*sin(d*x+c)+51
*I*cos(d*x+c)+11*sin(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)
/cos(d*x+c)^6/a^4
```

maxima [B] time = 1.20, size = 764, normalized size = 10.47

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^11/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] -2/143*(-15*I*sqrt(a) - 38*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) - 88*I*s
qrt(a)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 278*sqrt(a)*sin(d*x + c)^3/(co
s(d*x + c) + 1)^3 - 213*I*sqrt(a)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 920
*sqrt(a)*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 272*I*sqrt(a)*sin(d*x + c)^6
/(cos(d*x + c) + 1)^6 - 1848*sqrt(a)*sin(d*x + c)^7/(cos(d*x + c) + 1)^7 -
182*I*sqrt(a)*sin(d*x + c)^8/(cos(d*x + c) + 1)^8 - 2548*sqrt(a)*sin(d*x +
c)^9/(cos(d*x + c) + 1)^9 - 2548*sqrt(a)*sin(d*x + c)^11/(cos(d*x + c) + 1)
^11 + 182*I*sqrt(a)*sin(d*x + c)^12/(cos(d*x + c) + 1)^12 - 1848*sqrt(a)*si
n(d*x + c)^13/(cos(d*x + c) + 1)^13 + 272*I*sqrt(a)*sin(d*x + c)^14/(cos(d*
```

```
x + c) + 1)^14 - 920*sqrt(a)*sin(d*x + c)^15/(cos(d*x + c) + 1)^15 + 213*I*
sqrt(a)*sin(d*x + c)^16/(cos(d*x + c) + 1)^16 - 278*sqrt(a)*sin(d*x + c)^17
/(cos(d*x + c) + 1)^17 + 88*I*sqrt(a)*sin(d*x + c)^18/(cos(d*x + c) + 1)^18
 - 38*sqrt(a)*sin(d*x + c)^19/(cos(d*x + c) + 1)^19 + 15*I*sqrt(a)*sin(d*x
+ c)^20/(cos(d*x + c) + 1)^20)*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(7/2)*
(sin(d*x + c)/(cos(d*x + c) + 1) - 1)^(7/2)/((a^4 - 10*a^4*sin(d*x + c)^2/(
cos(d*x + c) + 1)^2 + 45*a^4*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 120*a^4*
sin(d*x + c)^6/(cos(d*x + c) + 1)^6 + 210*a^4*sin(d*x + c)^8/(cos(d*x + c)
+ 1)^8 - 252*a^4*sin(d*x + c)^10/(cos(d*x + c) + 1)^10 + 210*a^4*sin(d*x +
c)^12/(cos(d*x + c) + 1)^12 - 120*a^4*sin(d*x + c)^14/(cos(d*x + c) + 1)^14
 + 45*a^4*sin(d*x + c)^16/(cos(d*x + c) + 1)^16 - 10*a^4*sin(d*x + c)^18/(c
os(d*x + c) + 1)^18 + a^4*sin(d*x + c)^20/(cos(d*x + c) + 1)^20)*d*(-2*I*si
n(d*x + c)/(cos(d*x + c) + 1) + sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 1)^(7
/2))
```

mupad [B] time = 6.62, size = 91, normalized size = 1.25

$$\frac{128\,\mathrm{e}^{-c\,1\mathrm{i}-d\,x\,1\mathrm{i}}\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,13\mathrm{i}+2\mathrm{i}\right)\,\sqrt{a-\frac{a\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}\,1\mathrm{i}-\mathrm{i}\right)\,1\mathrm{i}}{\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1}}}{143\,a^4\,d\,\left(\mathrm{e}^{c\,2\mathrm{i}+d\,x\,2\mathrm{i}}+1\right)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^11*(a + a*tan(c + d*x)*1i)^(7/2)),x)
```

```
[Out] (128*exp(- c*1i - d*x*1i)*(exp(c*2i + d*x*2i)*13i + 2i)*(a - (a*(exp(c*2i +
 d*x*2i)*1i - 1i)*1i)/(exp(c*2i + d*x*2i) + 1))^(1/2))/(143*a^4*d*(exp(c*2i
 + d*x*2i) + 1)^6)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**11/(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.387 $\int \frac{\sec^9(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=35

$$\frac{2ia\sec^9(c+dx)}{9d(a+ia\tan(c+dx))^{9/2}}$$

```
[Out] 2/9*I*a*sec(d*x+c)^9/d/(a+I*a*tan(d*x+c))^(9/2)
```

Rubi [A] time = 0.06, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.038, Rules used = {3493}

$$\frac{2ia\sec^9(c+dx)}{9d(a+ia\tan(c+dx))^{9/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^9/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((2*I)/9)*a*Sec[c + d*x]^9)/(d*(a + I*a*Tan[c + d*x])^(9/2))
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rubi steps

$$\int \frac{\sec^9(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx = \frac{2ia\sec^9(c+dx)}{9d(a+ia\tan(c+dx))^{9/2}}$$

Mathematica [A] time = 0.46, size = 59, normalized size = 1.69

$$\frac{2i(\tan(c+dx)+i)\sec^7(c+dx)}{9a^3d(\tan(c+dx)-i)^3\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^9/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((2*I)/9)*Sec[c + d*x]^7*(I + Tan[c + d*x]))/(a^3*d*(-I + Tan[c + d*x])^3*
Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [B] time = 0.77, size = 89, normalized size = 2.54

$$\frac{32i\sqrt{2}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}}{9\left(a^4de^{(8i\,dx+8i\,c)}+4\,a^4de^{(6i\,dx+6i\,c)}+6\,a^4de^{(4i\,dx+4i\,c)}+4\,a^4de^{(2i\,dx+2i\,c)}+a^4d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 32/9*I*sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))/(a^4*d*e^(8*I*d*x + 8*I*c)
 + 4*a^4*d*e^(6*I*d*x + 6*I*c) + 6*a^4*d*e^(4*I*d*x + 4*I*c) + 4*a^4*d*e^(2
*I*d*x + 2*I*c) + a^4*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)^9}{(i\,a\tan(dx+c)+a)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^9/(I*a*tan(d*x + c) + a)^(7/2), x)
```

maple [B] time = 1.20, size = 115, normalized size = 3.29

$$\frac{2\left(16i\left(\cos^5(dx+c)\right)+16\sin(dx+c)\left(\cos^4(dx+c)\right)-20i\left(\cos^3(dx+c)\right)-12\left(\cos^2(dx+c)\right)\sin(dx+c)+\right.}{9d\cos(dx+c)^4a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] 2/9/d*(16*I*cos(d*x+c)^5+16*sin(d*x+c)*cos(d*x+c)^4-20*I*cos(d*x+c)^3-12*co
s(d*x+c)^2*sin(d*x+c)+5*I*cos(d*x+c)+sin(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c
))/cos(d*x+c))^(1/2)/cos(d*x+c)^4/a^4
```

maxima [B] time = 1.02, size = 626, normalized size = 17.89

$$-\frac{2\left(-i\sqrt{a}-\frac{2\sqrt{a}\sin(dx+c)}{\cos(dx+c)+1}-\frac{6i\sqrt{a}\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-\frac{14\sqrt{a}\sin(dx+c)^3}{(\cos(dx+c)+1)^3}-\frac{14i\sqrt{a}\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{42\sqrt{a}\sin(dx+c)^5}{(\cos(dx+c)+1)^5}-\frac{14i\sqrt{a}\sin(dx+c)^6}{(\cos(dx+c)+1)^6}-\right.}{9\left(a^4-\frac{8a^4\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{28a^4\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{56a^4\sin}{(\cos(dx}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^9/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] -2/9*(-I*sqrt(a) - 2*sqrt(a)*sin(d*x + c)/(cos(d*x + c) + 1) - 6*I*sqrt(a)*
sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 14*sqrt(a)*sin(d*x + c)^3/(cos(d*x +
c) + 1)^3 - 14*I*sqrt(a)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 42*sqrt(a)*s
in(d*x + c)^5/(cos(d*x + c) + 1)^5 - 14*I*sqrt(a)*sin(d*x + c)^6/(cos(d*x +
 c) + 1)^6 - 70*sqrt(a)*sin(d*x + c)^7/(cos(d*x + c) + 1)^7 - 70*sqrt(a)*si
n(d*x + c)^9/(cos(d*x + c) + 1)^9 + 14*I*sqrt(a)*sin(d*x + c)^10/(cos(d*x +
 c) + 1)^10 - 42*sqrt(a)*sin(d*x + c)^11/(cos(d*x + c) + 1)^11 + 14*I*sqrt(
a)*sin(d*x + c)^12/(cos(d*x + c) + 1)^12 - 14*sqrt(a)*sin(d*x + c)^13/(cos(
d*x + c) + 1)^13 + 6*I*sqrt(a)*sin(d*x + c)^14/(cos(d*x + c) + 1)^14 - 2*sq
rt(a)*sin(d*x + c)^15/(cos(d*x + c) + 1)^15 + I*sqrt(a)*sin(d*x + c)^16/(co
s(d*x + c) + 1)^16)*(sin(d*x + c)/(cos(d*x + c) + 1) + 1)^(7/2)*(sin(d*x +
c)/(cos(d*x + c) + 1) - 1)^(7/2)/((a^4 - 8*a^4*sin(d*x + c)^2/(cos(d*x + c)
 + 1)^2 + 28*a^4*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 56*a^4*sin(d*x + c)^
6/(cos(d*x + c) + 1)^6 + 70*a^4*sin(d*x + c)^8/(cos(d*x + c) + 1)^8 - 56*a^
4*sin(d*x + c)^10/(cos(d*x + c) + 1)^10 + 28*a^4*sin(d*x + c)^12/(cos(d*x +
 c) + 1)^12 - 8*a^4*sin(d*x + c)^14/(cos(d*x + c) + 1)^14 + a^4*sin(d*x + c
)^16/(cos(d*x + c) + 1)^16)*d*(-2*I*sin(d*x + c)/(cos(d*x + c) + 1) + sin(d
*x + c)^2/(cos(d*x + c) + 1)^2 - 1)^(7/2))
```

mupad [B] time = 6.49, size = 50, normalized size = 1.43

$$\frac{\mathrm{e}^{-c\,5\mathrm{i}-d\,x\,5\mathrm{i}}\sqrt{a+\frac{a\,\sin(c+d\,x)\,1\mathrm{i}}{\cos(c+d\,x)}}\,2\mathrm{i}}{9\,a^4\,d\cos(c+d\,x)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^9*(a + a*tan(c + d*x)*1i)^(7/2)),x)
```

```
[Out] (exp(- c*5i - d*x*5i)*(a + (a*sin(c + d*x)*1i)/cos(c + d*x))^(1/2)*2i)/(9*a
^4*d*cos(c + d*x)^4)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**9/(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.388 $\int \frac{\sec^7(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=160

$$\frac{8i\sqrt{2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{a^{7/2}d}-\frac{8i\sec(c+dx)}{a^3d\sqrt{a+ia\tan(c+dx)}}-\frac{4i\sec^3(c+dx)}{3a^2d(a+ia\tan(c+dx))^{3/2}}-\frac{2i\sec^5(c+dx)}{5ad(a+ia\tan(c+dx)}$$

```
[Out] 8*I*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2))*2^(1/2
)/a^(7/2)/d-8*I*sec(d*x+c)/a^3/d/(a+I*a*tan(d*x+c))^(1/2)-2/5*I*sec(d*x+c)^
5/a/d/(a+I*a*tan(d*x+c))^(5/2)-4/3*I*sec(d*x+c)^3/a^2/d/(a+I*a*tan(d*x+c))^
(3/2)
```

Rubi [A] time = 0.25, antiderivative size = 160, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.115, Rules used = {3491, 3489, 206}

$$-\frac{4i\sec^3(c+dx)}{3a^2d(a+ia\tan(c+dx))^{3/2}}-\frac{8i\sec(c+dx)}{a^3d\sqrt{a+ia\tan(c+dx)}}+\frac{8i\sqrt{2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{a^{7/2}d}-\frac{2i\sec^5(c+dx)}{5ad(a+ia\tan(c+d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^7/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] ((8*I)*Sqrt[2]*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[c +
 d*x]])])/(a^(7/2)*d) - (((2*I)/5)*Sec[c + d*x]^5)/(a*d*(a + I*a*Tan[c + d*
x])^(5/2)) - (((4*I)/3)*Sec[c + d*x]^3)/(a^2*d*(a + I*a*Tan[c + d*x])^(3/2)
) - ((8*I)*Sec[c + d*x])/(a^3*d*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3491

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e
+ f*x])^(n + 1))/(b*f*(m - 2)), x] + Dist[(2*d^2)/a, Int[(d*Sec[e + f*x])^(
m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f}, x] &&
 EqQ[a^2 + b^2, 0] && EqQ[m/2 + n, 0] && LtQ[n, -1]
```

Rubi steps

$$\int \frac{\sec^7(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx = -\frac{2i\sec^5(c+dx)}{5ad(a+ia\tan(c+dx))^{5/2}} + \frac{2\int \frac{\sec^5(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx}{a}$$

$$= -\frac{2i\sec^5(c+dx)}{5ad(a+ia\tan(c+dx))^{5/2}} - \frac{4i\sec^3(c+dx)}{3a^2d(a+ia\tan(c+dx))^{3/2}} + \frac{4\int \frac{\sec^3(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx}{a^2}$$

$$= -\frac{2i\sec^5(c+dx)}{5ad(a+ia\tan(c+dx))^{5/2}} - \frac{4i\sec^3(c+dx)}{3a^2d(a+ia\tan(c+dx))^{3/2}} - \frac{8i\sec(c+dx)}{a^3d\sqrt{a+ia\tan(c+d}$$

$$= -\frac{2i\sec^5(c+dx)}{5ad(a+ia\tan(c+dx))^{5/2}} - \frac{4i\sec^3(c+dx)}{3a^2d(a+ia\tan(c+dx))^{3/2}} - \frac{8i\sec(c+dx)}{a^3d\sqrt{a+ia\tan(c+d}$$

$$= \frac{8i\sqrt{2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{a^{7/2}d} - \frac{2i\sec^5(c+dx)}{5ad(a+ia\tan(c+dx))^{5/2}} - \frac{4i\sec^3(c+}{3a^2d(a+ia\tan(c}$$

Mathematica [A] time = 1.22, size = 130, normalized size = 0.81

$$-\frac{128e^{7i(c+dx)}\left(-35e^{2i(c+dx)}-15e^{4i(c+dx)}+15\left(1+e^{2i(c+dx)}\right)^{5/2}\tanh^{-1}\left(\sqrt{1+e^{2i(c+dx)}}\right)-23\right)}{15a^3d\left(1+e^{2i(c+dx)}\right)^6(\tan(c+dx)-i)^3\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^7/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (-128*E^((7*I)*(c + d*x))*(-23 - 35*E^((2*I)*(c + d*x)) - 15*E^((4*I)*(c +
d*x)) + 15*(1 + E^((2*I)*(c + d*x)))^(5/2)*ArcTanh[Sqrt[1 + E^((2*I)*(c + d
*x))]]))/(15*a^3*d*(1 + E^((2*I)*(c + d*x)))^6*(-I + Tan[c + d*x])^3*Sqrt[a
 + I*a*Tan[c + d*x]])
```

fricas [B] time = 0.59, size = 323, normalized size = 2.02

$$\frac{\sqrt{2}\left(60i\,a^4de^{(4i\,dx+4i\,c)}+120i\,a^4de^{(2i\,dx+2i\,c)}+60i\,a^4d\right)\sqrt{\frac{1}{a^7d^2}}\,\log\left(\frac{\left(2\left(16i\,a^3de^{(2i\,dx+2i\,c)}+16i\,a^3d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{a^7d^2}}+32i\right)e^{(-i}}{a^3d}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/15*(sqrt(2)*(60*I*a^4*d*e^(4*I*d*x + 4*I*c) + 120*I*a^4*d*e^(2*I*d*x + 2*
I*c) + 60*I*a^4*d)*sqrt(1/(a^7*d^2))*log((2*(16*I*a^3*d*e^(2*I*d*x + 2*I*c)
 + 16*I*a^3*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a^7*d^2)) + 32*I)*
e^(-I*d*x - I*c)/(a^3*d)) + sqrt(2)*(-60*I*a^4*d*e^(4*I*d*x + 4*I*c) - 120*
I*a^4*d*e^(2*I*d*x + 2*I*c) - 60*I*a^4*d)*sqrt(1/(a^7*d^2))*log((2*(-16*I*a
^3*d*e^(2*I*d*x + 2*I*c) - 16*I*a^3*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sq
rt(1/(a^7*d^2)) + 32*I)*e^(-I*d*x - I*c)/(a^3*d)) + sqrt(2)*sqrt(a/(e^(2*I*
d*x + 2*I*c) + 1))*(-120*I*e^(4*I*d*x + 4*I*c) - 280*I*e^(2*I*d*x + 2*I*c)
- 184*I))/(a^4*d*e^(4*I*d*x + 4*I*c) + 2*a^4*d*e^(2*I*d*x + 2*I*c) + a^4*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)^7}{(i\,a\tan(dx+c)+a)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^7/(I*a*tan(d*x + c) + a)^(7/2), x)
```

maple [B] time = 1.26, size = 399, normalized size = 2.49

$$2\left(-15\left(\cos^{2}\left(dx+c\right)\right)\arctan\left(\frac{\left(i\cos(dx+c)-i+\sin(dx+c)\right)\sqrt{2}}{2\sin(dx+c)\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}}\right)\sqrt{2}\ \sin\left(dx+c\right)\left(-\frac{2\cos(dx+c)}{1+\cos(dx+c)}\right)^{\frac{5}{2}}-30\cos\left(dx+c\right)\text{arcta}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] 2/15/d*(-15*cos(d*x+c)^2*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/
(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)*sin(d*x+c)*(-2*cos(d*
x+c)/(1+cos(d*x+c)))^(5/2)-30*cos(d*x+c)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x
+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)*sin(d
*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(5/2)-15*2^(1/2)*arctan(1/2*(I*cos(d*x
+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*
(-2*cos(d*x+c)/(1+cos(d*x+c)))^(5/2)*sin(d*x+c)+92*I*cos(d*x+c)^3-76*I*cos(
d*x+c)^2+92*cos(d*x+c)^2*sin(d*x+c)-19*I*cos(d*x+c)-16*cos(d*x+c)*sin(d*x+c
)+3*I-3*sin(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/(I*sin(d
*x+c)+cos(d*x+c)-1)/cos(d*x+c)^2/a^4
```

maxima [B] time = 1.09, size = 1166, normalized size = 7.29

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] -1/15*((60*(sqrt(2)*cos(2*d*x + 2*c)^2 + sqrt(2)*sin(2*d*x + 2*c)^2 + 2*sqr
t(2)*cos(2*d*x + 2*c) + sqrt(2))*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x +
2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*
x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)
) + 1) - 60*(sqrt(2)*cos(2*d*x + 2*c)^2 + sqrt(2)*sin(2*d*x + 2*c)^2 + 2*sq
rt(2)*cos(2*d*x + 2*c) + sqrt(2))*arctan2((cos(2*d*x + 2*c)^2 + sin(2*d*x +
 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x + 2*c), c
os(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d
*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1
)) - 1) - (30*I*sqrt(2)*cos(2*d*x + 2*c)^2 + 30*I*sqrt(2)*sin(2*d*x + 2*c)^
2 + 60*I*sqrt(2)*cos(2*d*x + 2*c) + 30*I*sqrt(2))*log(sqrt(cos(2*d*x + 2*c)
^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*cos(1/2*arctan2(sin(2*d*x
 + 2*c), cos(2*d*x + 2*c) + 1))^2 + sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2
*c)^2 + 2*cos(2*d*x + 2*c) + 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c) + 1))^2 + 2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x
+ 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))
+ 1) - (-30*I*sqrt(2)*cos(2*d*x + 2*c)^2 - 30*I*sqrt(2)*sin(2*d*x + 2*c)^2
- 60*I*sqrt(2)*cos(2*d*x + 2*c) - 30*I*sqrt(2))*log(sqrt(cos(2*d*x + 2*c)^2
 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*cos(1/2*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c) + 1))^2 + sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c
)^2 + 2*cos(2*d*x + 2*c) + 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
 2*c) + 1))^2 - 2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x +
2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) +
1))*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4
```

```
)*sqrt(a) - ((-120*I*sqrt(2)*cos(4*d*x + 4*c) - 280*I*sqrt(2)*cos(2*d*x + 2
*c) + 120*sqrt(2)*sin(4*d*x + 4*c) + 280*sqrt(2)*sin(2*d*x + 2*c) - 184*I*s
qrt(2))*cos(5/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - (120*sqr
t(2)*cos(4*d*x + 4*c) + 280*sqrt(2)*cos(2*d*x + 2*c) + 120*I*sqrt(2)*sin(4*
d*x + 4*c) + 280*I*sqrt(2)*sin(2*d*x + 2*c) + 184*sqrt(2))*sin(5/2*arctan2(
sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)))*sqrt(a))/((a^4*cos(2*d*x + 2*c)^2
 + a^4*sin(2*d*x + 2*c)^2 + 2*a^4*cos(2*d*x + 2*c) + a^4)*(cos(2*d*x + 2*c)
^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\cos\left(c+d\,x\right)^7\,{\left(a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^{7/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^7*(a + a*tan(c + d*x)*1i)^(7/2)),x)
```

```
[Out] int(1/(cos(c + d*x)^7*(a + a*tan(c + d*x)*1i)^(7/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^{7}{\left(c + d x \right)}}{\left(i a \left(\tan{\left(c + d x \right)} - i\right)\right)^{\frac{7}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**7/(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Integral(sec(c + d*x)**7/(I*a*(tan(c + d*x) - I))**(7/2), x)
```

3.389 $\int \frac{\sec^5(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=121

$$-\frac{3i\sqrt{2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{a^{7/2}d}+\frac{6i\sec(c+dx)}{a^2d(a+ia\tan(c+dx))^{3/2}}-\frac{2i\sec^3(c+dx)}{ad(a+ia\tan(c+dx))^{5/2}}$$

```
[Out] -3*I*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2))*2^(1/
2)/a^(7/2)/d-2*I*sec(d*x+c)^3/a/d/(a+I*a*tan(d*x+c))^(5/2)+6*I*sec(d*x+c)/a
^2/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.22, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3501, 3502, 3489, 206}

$$\frac{6i\sec(c+dx)}{a^2d(a+ia\tan(c+dx))^{3/2}}-\frac{3i\sqrt{2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{a^{7/2}d}-\frac{2i\sec^3(c+dx)}{ad(a+ia\tan(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^5/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] ((-3*I)*Sqrt[2]*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[c
+ d*x]])])/(a^(7/2)*d) - ((2*I)*Sec[c + d*x]^3)/(a*d*(a + I*a*Tan[c + d*x])
^(5/2)) + ((6*I)*Sec[c + d*x])/(a^2*d*(a + I*a*Tan[c + d*x])^(3/2))
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{\sec^5(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx = -\frac{2i\sec^3(c+dx)}{ad(a+ia\tan(c+dx))^{5/2}} + \frac{6\int \frac{\sec^3(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx}{a}$$
$$= -\frac{2i\sec^3(c+dx)}{ad(a+ia\tan(c+dx))^{5/2}} + \frac{12i\sec(c+dx)}{a^2d(a+ia\tan(c+dx))^{3/2}} - \frac{12\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx}{a^2}$$
$$= -\frac{2i\sec^3(c+dx)}{ad(a+ia\tan(c+dx))^{5/2}} + \frac{6i\sec(c+dx)}{a^2d(a+ia\tan(c+dx))^{3/2}} - \frac{3\int \frac{\sec(c+dx)}{\sqrt{a+ia\tan(c+dx)}}\,dx}{a^3}$$
$$= -\frac{2i\sec^3(c+dx)}{ad(a+ia\tan(c+dx))^{5/2}} + \frac{6i\sec(c+dx)}{a^2d(a+ia\tan(c+dx))^{3/2}} - \frac{(6i)\,\text{Subst}\left(\int \frac{1}{2-ax^2}\,dx, x\right.}{a^3d}$$
$$= -\frac{3i\sqrt{2}\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{a^{7/2}d} - \frac{2i\sec^3(c+dx)}{ad(a+ia\tan(c+dx))^{5/2}} + \frac{6i\sec(c+d}{a^2d(a+ia\tan(c+}$$

Mathematica [A] time = 0.95, size = 126, normalized size = 1.04

$$\frac{16e^{5i(c+dx)}\left(-3e^{2i(c+dx)}+3e^{2i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\tanh^{-1}\left(\sqrt{1+e^{2i(c+dx)}}\right)-1\right)}{a^3d\left(1+e^{2i(c+dx)}\right)^4(\tan(c+dx)-i)^3\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^5/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (16*E^((5*I)*(c + d*x))*(-1 - 3*E^((2*I)*(c + d*x)) + 3*E^((2*I)*(c + d*x))
*Sqrt[1 + E^((2*I)*(c + d*x))]*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]]))/(a^
3*d*(1 + E^((2*I)*(c + d*x)))^4*(-I + Tan[c + d*x])^3*Sqrt[a + I*a*Tan[c +
d*x]])
```

fricas [B] time = 0.57, size = 244, normalized size = 2.02

$$\frac{\left(3i\sqrt{2}\,a^4d\sqrt{\frac{1}{a^7d^2}}\,e^{(2i\,dx+2i\,c)}\log\left(\frac{\left(2\left(6i\,a^3de^{(2i\,dx+2i\,c)}+6i\,a^3d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{a^7d^2}}-12i\right)e^{(-i\,dx-i\,c)}}{a^3d}\right)-3i\sqrt{2}\,a^4d\sqrt{\frac{1}{a^7d^2}}\,e^{(2i\,dx+2i\,c)}\,l}{2\,a^4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/2*(3*I*sqrt(2)*a^4*d*sqrt(1/(a^7*d^2))*e^(2*I*d*x + 2*I*c)*log((2*(6*I*a^
3*d*e^(2*I*d*x + 2*I*c) + 6*I*a^3*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt
(1/(a^7*d^2)) - 12*I)*e^(-I*d*x - I*c)/(a^3*d)) - 3*I*sqrt(2)*a^4*d*sqrt(1/
(a^7*d^2))*e^(2*I*d*x + 2*I*c)*log((2*(-6*I*a^3*d*e^(2*I*d*x + 2*I*c) - 6*I
*a^3*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a^7*d^2)) - 12*I)*e^(-I*d
*x - I*c)/(a^3*d)) + sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(6*I*e^(2*I*
d*x + 2*I*c) + 2*I))*e^(-2*I*d*x - 2*I*c)/(a^4*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)^5}{(i\,a\tan(dx+c)+a)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

[Out] integrate(sec(d*x + c)^5/(I*a*tan(d*x + c) + a)^(7/2), x)

maple [B] time = 1.20, size = 318, normalized size = 2.63

$$-\frac{\left(3i\cos\left(dx+c\right)\sqrt{2}\,\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\,\arctan\left(\frac{(i\cos(dx+c)-i+\sin(dx+c))\sqrt{2}}{2\sin(dx+c)\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}}\right)+3\sqrt{2}\,\sin\left(dx+c\right)\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\,\operatorname{arcta}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^(7/2),x)

[Out] -1/2/d*(3*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I
+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*cos(d
*x+c)*2^(1/2)+3*2^(1/2)*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arc
tan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)
))^(1/2)*2^(1/2))+3*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*co
s(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1
/2))*2^(1/2)-8*I*cos(d*x+c)^3-8*cos(d*x+c)^2*sin(d*x+c)-4*sin(d*x+c))*(a*(I
*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/a^4

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sec(d*x+c)^5/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")

[Out] Timed out

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\cos\left(c+d\,x\right)^5\,{\left(a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^{7/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^(7/2)),x)

[Out] int(1/(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^(7/2)), x)

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^{5}{\left(c + dx \right)}}{\left(ia \left(\tan{\left(c + dx \right)} - i\right)\right)^{\frac{7}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sec(d*x+c)**5/(a+I*a*tan(d*x+c))**(7/2),x)

[Out] Integral(sec(c + d*x)**5/(I*a*(tan(c + d*x) - I))**(7/2), x)

3.390 $\int \frac{\sec^3(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=125

$$-\frac{i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{8\sqrt{2}a^{7/2}d}-\frac{i\sec(c+dx)}{8a^2d(a+ia\tan(c+dx))^{3/2}}+\frac{i\sec(c+dx)}{2ad(a+ia\tan(c+dx))^{5/2}}$$

```
[Out] -1/16*I*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2))/a^
(7/2)/d*2^(1/2)+1/2*I*sec(d*x+c)/a/d/(a+I*a*tan(d*x+c))^(5/2)-1/8*I*sec(d*x
+c)/a^2/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.19, antiderivative size = 125, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3501, 3502, 3489, 206}

$$-\frac{i\sec(c+dx)}{8a^2d(a+ia\tan(c+dx))^{3/2}}-\frac{i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{8\sqrt{2}a^{7/2}d}+\frac{i\sec(c+dx)}{2ad(a+ia\tan(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] ((-I/8)*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[c + d*x]])
])/(Sqrt[2]*a^(7/2)*d) + ((I/2)*Sec[c + d*x])/(a*d*(a + I*a*Tan[c + d*x])^(
5/2)) - ((I/8)*Sec[c + d*x])/(a^2*d*(a + I*a*Tan[c + d*x])^(3/2))
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{\sec^3(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx = \frac{2i\sec(c+dx)}{3ad(a+ia\tan(c+dx))^{5/2}} - \frac{2\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^{5/2}}dx}{3a}$$
$$= \frac{i\sec(c+dx)}{2ad(a+ia\tan(c+dx))^{5/2}} - \frac{\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^{3/2}}dx}{4a^2}$$
$$= \frac{i\sec(c+dx)}{2ad(a+ia\tan(c+dx))^{5/2}} - \frac{i\sec(c+dx)}{8a^2d(a+ia\tan(c+dx))^{3/2}} - \frac{\int \frac{\sec(c+dx)}{\sqrt{a+ia\tan(c+dx)}}dx}{16a^3}$$
$$= \frac{i\sec(c+dx)}{2ad(a+ia\tan(c+dx))^{5/2}} - \frac{i\sec(c+dx)}{8a^2d(a+ia\tan(c+dx))^{3/2}} - \frac{i\,\mathrm{Subst}\left(\int \frac{1}{2-ax^2}dx,\right.}{8a^3}$$
$$= -\frac{i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{8\sqrt{2}a^{7/2}d} + \frac{i\sec(c+dx)}{2ad(a+ia\tan(c+dx))^{5/2}} - \frac{i\sec(c+d}{8a^2d(a+ia\tan(c}$$

Mathematica [A] time = 1.00, size = 120, normalized size = 0.96

$$\frac{i\sec^3(c+dx)\left(i\sin(2(c+dx)) - 3\cos(2(c+dx)) + e^{2i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\tanh^{-1}\left(\sqrt{1+e^{2i(c+dx)}}\right) - 3\right)}{16a^3d(\tan(c+dx)-i)^2\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^3/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] ((I/16)*Sec[c + d*x]^3*(-3 + E^((2*I)*(c + d*x))*Sqrt[1 + E^((2*I)*(c + d*x
))]*ArcTanh[Sqrt[1 + E^((2*I)*(c + d*x))]] - 3*Cos[2*(c + d*x)] + I*Sin[2*(
c + d*x)]))/(a^3*d*(-I + Tan[c + d*x])^2*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [B] time = 0.83, size = 267, normalized size = 2.14

$$\left(i\sqrt{\frac{1}{2}}a^4d\sqrt{\frac{1}{a^7d^2}}e^{(4i\,dx+4i\,c)}\log\left(\frac{\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(4i\,a^3de^{(2i\,dx+2i\,c)}+4i\,a^3d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{a^7d^2}}-4i\right)e^{(-i\,dx-i\,c)}}{16\,a^3d}\right) - i\sqrt{\frac{1}{2}}a^4d\sqrt{\frac{1}{a^7d^2}}e^{(4i\,dx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/16*(I*sqrt(1/2)*a^4*d*sqrt(1/(a^7*d^2))*e^(4*I*d*x + 4*I*c)*log(1/16*(sqr
t(2)*sqrt(1/2)*(4*I*a^3*d*e^(2*I*d*x + 2*I*c) + 4*I*a^3*d)*sqrt(a/(e^(2*I*d
*x + 2*I*c) + 1))*sqrt(1/(a^7*d^2)) - 4*I)*e^(-I*d*x - I*c)/(a^3*d)) - I*sq
rt(1/2)*a^4*d*sqrt(1/(a^7*d^2))*e^(4*I*d*x + 4*I*c)*log(1/16*(sqrt(2)*sqrt(
1/2)*(-4*I*a^3*d*e^(2*I*d*x + 2*I*c) - 4*I*a^3*d)*sqrt(a/(e^(2*I*d*x + 2*I*
c) + 1))*sqrt(1/(a^7*d^2)) - 4*I)*e^(-I*d*x - I*c)/(a^3*d)) + sqrt(2)*sqrt(
a/(e^(2*I*d*x + 2*I*c) + 1))*(I*e^(4*I*d*x + 4*I*c) + 3*I*e^(2*I*d*x + 2*I*
c) + 2*I))*e^(-4*I*d*x - 4*I*c)/(a^4*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)^3}{(i\,a\tan(dx+c)+a)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate(sec(d*x + c)^3/(I*a*tan(d*x + c) + a)^(7/2), x)
```

maple [B] time = 1.25, size = 346, normalized size = 2.77

$$\frac{\left(64i\left(\cos^5(dx+c)\right)+64\sin(dx+c)\left(\cos^4(dx+c)\right)-i\cos(dx+c)\sqrt{2}\sqrt{-\frac{2\cos(dx+c)}{1+\cos(dx+c)}}\arctan\left(\frac{(i\cos(dx+c)-i+\sin(dx}{2\sin(dx+c)\sqrt{-\frac{2\cos}{1+\cos}}}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] 1/32/d*(64*I*cos(d*x+c)^5+64*sin(d*x+c)*cos(d*x+c)^4-I*cos(d*x+c)*(-2*cos(d
*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+
c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)-56*I*cos(d*x+c)^3-
I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c
))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)-2^(1/2)
*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I
+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))-24*co
s(d*x+c)^2*sin(d*x+c)+4*I*cos(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+
c))^(1/2)/a^4
```

maxima [B] time = 1.01, size = 976, normalized size = 7.81

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] 1/64*((cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(3
/4)*((4*I*sqrt(2)*cos(4*d*x + 4*c) + 4*sqrt(2)*sin(4*d*x + 4*c))*cos(3/2*ar
ctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 4*(sqrt(2)*cos(4*d*x + 4*c
) - I*sqrt(2)*sin(4*d*x + 4*c))*sin(3/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c) + 1)))*sqrt(a) + (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2
*d*x + 2*c) + 1)^(1/4)*((4*I*sqrt(2)*cos(4*d*x + 4*c) + 4*sqrt(2)*sin(4*d*x
 + 4*c))*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 4*(sqrt
(2)*cos(4*d*x + 4*c) - I*sqrt(2)*sin(4*d*x + 4*c))*sin(1/2*arctan2(sin(2*d*
x + 2*c), cos(2*d*x + 2*c) + 1)))*sqrt(a) + (2*sqrt(2)*arctan2((cos(2*d*x +
 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan
2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x
 + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c) + 1)) + 1) - 2*sqrt(2)*arctan2((cos(2*d*x + 2*c)^2 + sin(
2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*sin(1/2*arctan2(sin(2*d*x +
2*c), cos(2*d*x + 2*c) + 1)), (cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*
cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2
*c) + 1)) - 1) - I*sqrt(2)*log(sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2
 + 2*cos(2*d*x + 2*c) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*
c) + 1))^2 + sqrt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2
*c) + 1)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + 2*(co
s(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1
/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 1) + I*sqrt(2)*log(sq
rt(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*cos(1/
2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1))^2 + sqrt(cos(2*d*x + 2*c
)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)*sin(1/2*arctan2(sin(2*d*
x + 2*c), cos(2*d*x + 2*c) + 1))^2 - 2*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*
c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/4)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(
2*d*x + 2*c) + 1)) + 1))*sqrt(a))/(a^4*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\cos(c+d\,x)^3\,(a+a\tan(c+d\,x)\,1\mathrm{i})^{7/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^(7/2)),x)
```

```
[Out] int(1/(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^(7/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^3(c+dx)}{(ia(\tan(c+dx)-i))^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3/(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Integral(sec(c + d*x)**3/(I*a*(tan(c + d*x) - I))**(7/2), x)
```

3.391 $\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=157

$$\frac{5i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{64\sqrt{2}\,a^{7/2}d}+\frac{5i\sec(c+dx)}{64a^2d(a+ia\tan(c+dx))^{3/2}}+\frac{5i\sec(c+dx)}{48ad(a+ia\tan(c+dx))^{5/2}}+\frac{i\sec(c+dx)}{6d(a+ia\tan(c+dx))^{7/2}}$$

```
[Out] 5/128*I*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2))/a^
(7/2)/d*2^(1/2)+1/6*I*sec(d*x+c)/d/(a+I*a*tan(d*x+c))^(7/2)+5/48*I*sec(d*x+
c)/a/d/(a+I*a*tan(d*x+c))^(5/2)+5/64*I*sec(d*x+c)/a^2/d/(a+I*a*tan(d*x+c))^
(3/2)
```

Rubi [A] time = 0.16, antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.125$, Rules used = {3502, 3489, 206}

$$\frac{5i\sec(c+dx)}{64a^2d(a+ia\tan(c+dx))^{3/2}}+\frac{5i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{64\sqrt{2}\,a^{7/2}d}+\frac{5i\sec(c+dx)}{48ad(a+ia\tan(c+dx))^{5/2}}+\frac{i\sec(c+dx)}{6d(a+ia\tan(c+dx))^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((5*I)/64)*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[c + d*
x]])])/(Sqrt[2]*a^(7/2)*d) + ((I/6)*Sec[c + d*x])/(d*(a + I*a*Tan[c + d*x])
^(7/2)) + (((5*I)/48)*Sec[c + d*x])/(a*d*(a + I*a*Tan[c + d*x])^(5/2)) + ((
(5*I)/64)*Sec[c + d*x])/(a^2*d*(a + I*a*Tan[c + d*x])^(3/2))
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx = \frac{i\sec(c+dx)}{6d(a+ia\tan(c+dx))^{7/2}} + \frac{5\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx}{12a}$$

$$= \frac{i\sec(c+dx)}{6d(a+ia\tan(c+dx))^{7/2}} + \frac{5i\sec(c+dx)}{48ad(a+ia\tan(c+dx))^{5/2}} + \frac{5\int \frac{\sec(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,d}{32a^2}$$

$$= \frac{i\sec(c+dx)}{6d(a+ia\tan(c+dx))^{7/2}} + \frac{5i\sec(c+dx)}{48ad(a+ia\tan(c+dx))^{5/2}} + \frac{5i\sec(c+dx)}{64a^2d(a+ia\tan(c+}$$

$$= \frac{i\sec(c+dx)}{6d(a+ia\tan(c+dx))^{7/2}} + \frac{5i\sec(c+dx)}{48ad(a+ia\tan(c+dx))^{5/2}} + \frac{5i\sec(c+dx)}{64a^2d(a+ia\tan(c+}$$

$$= \frac{5i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{64\sqrt{2}a^{7/2}d} + \frac{i\sec(c+dx)}{6d(a+ia\tan(c+dx))^{7/2}} + \frac{5i\sec(c+dx}{48ad(a+ia\tan(c+}$$

Mathematica [A] time = 1.51, size = 119, normalized size = 0.76

$$-\frac{\sec^3(c+dx)\left(50i\sin(2(c+dx))+82\cos(2(c+dx))+\frac{30e^{4i(c+dx)}\tanh^{-1}\left(\sqrt{1+e^{2i(c+dx)}}\right)}{\sqrt{1+e^{2i(c+dx)}}}+52\right)}{384a^3d(\tan(c+dx)-i)^3\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] -1/384*(Sec[c + d*x]^3*(52 + (30*E^((4*I)*(c + d*x))*ArcTanh[Sqrt[1 + E^((2
*I)*(c + d*x))]])/Sqrt[1 + E^((2*I)*(c + d*x))] + 82*Cos[2*(c + d*x)] + (50
*I)*Sin[2*(c + d*x)]))/(a^3*d*(-I + Tan[c + d*x])^3*Sqrt[a + I*a*Tan[c + d*
x]])
```

fricas [B] time = 0.67, size = 278, normalized size = 1.77

$$\left(15i\sqrt{\frac{1}{2}}a^4d\sqrt{\frac{1}{a^7d^2}}e^{(6i\,dx+6i\,c)}\log\left(\frac{\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(160i\,a^3de^{(2i\,dx+2i\,c)}+160i\,a^3d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{a^7d^2}}+160i\right)e^{(-i\,dx-i\,c)}}{1024\,a^3d}\right)-15i\sqrt{\frac{1}{2}}a^4d\sqrt{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/384*(15*I*sqrt(1/2)*a^4*d*sqrt(1/(a^7*d^2))*e^(6*I*d*x + 6*I*c)*log(1/102
4*(sqrt(2)*sqrt(1/2)*(160*I*a^3*d*e^(2*I*d*x + 2*I*c) + 160*I*a^3*d)*sqrt(a
/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a^7*d^2)) + 160*I)*e^(-I*d*x - I*c)/(a^
3*d)) - 15*I*sqrt(1/2)*a^4*d*sqrt(1/(a^7*d^2))*e^(6*I*d*x + 6*I*c)*log(1/10
24*(sqrt(2)*sqrt(1/2)*(-160*I*a^3*d*e^(2*I*d*x + 2*I*c) - 160*I*a^3*d)*sqrt
(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a^7*d^2)) + 160*I)*e^(-I*d*x - I*c)/(
a^3*d)) + sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(33*I*e^(6*I*d*x + 6*I*
c) + 59*I*e^(4*I*d*x + 4*I*c) + 34*I*e^(2*I*d*x + 2*I*c) + 8*I))*e^(-6*I*d*
x - 6*I*c)/(a^4*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(dx+c)}{(i\,a\tan(dx+c)+a)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")

[Out] integrate(sec(d*x + c)/(I*a*tan(d*x + c) + a)^(7/2), x)

maple [B] time = 0.94, size = 373, normalized size = 2.38

$$\left(1024i\left(\cos^7\left(dx+c\right)\right)+1024\sin\left(dx+c\right)\left(\cos^6\left(dx+c\right)\right)-704i\left(\cos^5\left(dx+c\right)\right)+15i\cos\left(dx+c\right)\sqrt{2}\,\sqrt{-\frac{2\cos(dx}{1+\cos(d}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(sec(d*x+c)/(a+I*a*tan(d*x+c))^(7/2),x)

[Out] 1/768/d*(1024*I*cos(d*x+c)^7+1024*sin(d*x+c)*cos(d*x+c)^6-704*I*cos(d*x+c)^5+15*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)*cos(d*x+c)-192*sin(d*x+c)*cos(d*x+c)^4+15*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)+8*I*cos(d*x+c)^3+15*2^(1/2)*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))+40*cos(d*x+c)^2*sin(d*x+c)-60*I*cos(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/a^4

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec\left(dx+c\right)}{\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")

[Out] integrate(sec(d*x + c)/(I*a*tan(d*x + c) + a)^(7/2), x)

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\cos\left(c+d\,x\right)\,{\left(a+a\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^{7/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^(7/2)),x)

[Out] int(1/(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^(7/2)), x)

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec\left(c+dx\right)}{\left(ia\left(\tan\left(c+dx\right)-i\right)\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sec(d*x+c)/(a+I*a*tan(d*x+c))**(7/2),x)

[Out] Integral(sec(c + d*x)/(I*a*(tan(c + d*x) - I))**(7/2), x)

3.392 $\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=227

$$\frac{315i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{2048\sqrt{2}a^{7/2}d}-\frac{315i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{2048a^4d}+\frac{105i\cos(c+dx)}{1024a^3d\sqrt{a+ia\tan(c+dx)}}+\frac{2}{256a^2d(}$$

```
[Out] 315/4096*I*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2))
/a^(7/2)/d*2^(1/2)+105/1024*I*cos(d*x+c)/a^3/d/(a+I*a*tan(d*x+c))^(1/2)-315
/2048*I*cos(d*x+c)*(a+I*a*tan(d*x+c))^(1/2)/a^4/d+1/8*I*cos(d*x+c)/d/(a+I*a
*tan(d*x+c))^(7/2)+3/32*I*cos(d*x+c)/a/d/(a+I*a*tan(d*x+c))^(5/2)+21/256*I*
cos(d*x+c)/a^2/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.38, antiderivative size = 227, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = {3502, 3490, 3489, 206}

$$-\frac{315i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{2048a^4d}+\frac{105i\cos(c+dx)}{1024a^3d\sqrt{a+ia\tan(c+dx)}}+\frac{21i\cos(c+dx)}{256a^2d(a+ia\tan(c+dx))^{3/2}}+\frac{315i\tan}{}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((315*I)/2048)*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[c
+ d*x]])])/(Sqrt[2]*a^(7/2)*d) + ((I/8)*Cos[c + d*x])/(d*(a + I*a*Tan[c + d
*x])^(7/2)) + (((3*I)/32)*Cos[c + d*x])/(a*d*(a + I*a*Tan[c + d*x])^(5/2))
+ (((21*I)/256)*Cos[c + d*x])/(a^2*d*(a + I*a*Tan[c + d*x])^(3/2)) + (((105
*I)/1024)*Cos[c + d*x])/(a^3*d*Sqrt[a + I*a*Tan[c + d*x]]) - (((315*I)/2048
)*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])/(a^4*d)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3490

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] + Dist[a/(2*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b*Tan[e +
f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] &&
EqQ[m/2 + n, 0] && GtQ[n, 0]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
```

]

Rubi steps

$$\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx = \frac{i\cos(c+dx)}{8d(a+ia\tan(c+dx))^{7/2}} + \frac{9\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx}{16a}$$
$$= \frac{i\cos(c+dx)}{8d(a+ia\tan(c+dx))^{7/2}} + \frac{3i\cos(c+dx)}{32ad(a+ia\tan(c+dx))^{5/2}} + \frac{21\int \frac{\cos(c+dx)}{(a+ia\tan(c+dx))^{3/2}}\,dx}{64a^2}$$
$$= \frac{i\cos(c+dx)}{8d(a+ia\tan(c+dx))^{7/2}} + \frac{3i\cos(c+dx)}{32ad(a+ia\tan(c+dx))^{5/2}} + \frac{21i\cos(c+dx)}{256a^2d(a+ia\tan(c+d}$$
$$= \frac{i\cos(c+dx)}{8d(a+ia\tan(c+dx))^{7/2}} + \frac{3i\cos(c+dx)}{32ad(a+ia\tan(c+dx))^{5/2}} + \frac{21i\cos(c+dx)}{256a^2d(a+ia\tan(c+d}$$
$$= \frac{i\cos(c+dx)}{8d(a+ia\tan(c+dx))^{7/2}} + \frac{3i\cos(c+dx)}{32ad(a+ia\tan(c+dx))^{5/2}} + \frac{21i\cos(c+dx)}{256a^2d(a+ia\tan(c+d}$$
$$= \frac{i\cos(c+dx)}{8d(a+ia\tan(c+dx))^{7/2}} + \frac{3i\cos(c+dx)}{32ad(a+ia\tan(c+dx))^{5/2}} + \frac{21i\cos(c+dx)}{256a^2d(a+ia\tan(c+d}$$
$$= \frac{315i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{2048\sqrt{2}a^{7/2}d} + \frac{i\cos(c+dx)}{8d(a+ia\tan(c+dx))^{7/2}} + \frac{3i\cos(c+dx}{32ad(a+ia\tan(c+}$$

Mathematica [A] time = 2.19, size = 141, normalized size = 0.62

$$-\frac{\sec^3(c+dx)\left(474i\sin(2(c+dx)) - 288i\sin(4(c+dx)) + 826\cos(2(c+dx)) - 224\cos(4(c+dx)) + \frac{630e^{4i(c+dx)}\tan}{\sqrt{1+}}\right.}{4096a^3d(\tan(c+dx)-i)^3\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] -1/4096*(Sec[c + d*x]^3*(420 + (630*E^((4*I)*(c + d*x))*ArcTanh[Sqrt[1 + E^
((2*I)*(c + d*x))]])/Sqrt[1 + E^((2*I)*(c + d*x))] + 826*Cos[2*(c + d*x)] -
 224*Cos[4*(c + d*x)] + (474*I)*Sin[2*(c + d*x)] - (288*I)*Sin[4*(c + d*x)]
))/(a^3*d*(-I + Tan[c + d*x])^3*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.78, size = 300, normalized size = 1.32

$$\left(315i\sqrt{\frac{1}{2}}a^4d\sqrt{\frac{1}{a^7d^2}}e^{(8i\,dx+8i\,c)}\log\left(\frac{\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(322560i\,a^3de^{(2i\,dx+2i\,c)}+322560i\,a^3d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{a^7d^2}}+322560i\right)e^{(-i\,dx-i\,c)}}{1048576\,a^3d}\right) - 315i\sqrt{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/4096*(315*I*sqrt(1/2)*a^4*d*sqrt(1/(a^7*d^2))*e^(8*I*d*x + 8*I*c)*log(1/1
048576*(sqrt(2)*sqrt(1/2)*(322560*I*a^3*d*e^(2*I*d*x + 2*I*c) + 322560*I*a^
3*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a^7*d^2)) + 322560*I)*e^(-I*
d*x - I*c)/(a^3*d)) - 315*I*sqrt(1/2)*a^4*d*sqrt(1/(a^7*d^2))*e^(8*I*d*x +
8*I*c)*log(1/1048576*(sqrt(2)*sqrt(1/2)*(-322560*I*a^3*d*e^(2*I*d*x + 2*I*c
```

```
) - 322560*I*a^3*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a^7*d^2)) + 3
22560*I)*e^(-I*d*x - I*c)/(a^3*d)) + sqrt(2)*sqrt(a/(e^(2*I*d*x + 2*I*c) +
1))*(-128*I*e^(10*I*d*x + 10*I*c) + 197*I*e^(8*I*d*x + 8*I*c) + 535*I*e^(6*
I*d*x + 6*I*c) + 298*I*e^(4*I*d*x + 4*I*c) + 104*I*e^(2*I*d*x + 2*I*c) + 16
*I))*e^(-8*I*d*x - 8*I*c)/(a^4*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos(dx+c)}{(i\,a\tan(dx+c)+a)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate(cos(d*x + c)/(I*a*tan(d*x + c) + a)^(7/2), x)
```

maple [B] time = 1.17, size = 400, normalized size = 1.76

$$\frac{\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(8192i\left(\cos^{9}(dx+c)\right)+8192\sin(dx+c)\left(\cos^{8}(dx+c)\right)-5120i\left(\cos^{7}(dx+c)\right)-102\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)/(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] 1/8192/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(8192*I*cos(d*x+c)^
9+8192*sin(d*x+c)*cos(d*x+c)^8-5120*I*cos(d*x+c)^7-1024*sin(d*x+c)*cos(d*x+
c)^6+64*I*cos(d*x+c)^5+315*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/
2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/
2)*2^(1/2))*2^(1/2)*cos(d*x+c)+576*sin(d*x+c)*cos(d*x+c)^4+168*I*cos(d*x+c)
^3+315*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+si
n(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))*2^(1/2)+
315*2^(1/2)*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*c
os(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(
1/2))+840*cos(d*x+c)^2*sin(d*x+c)-1260*I*cos(d*x+c))/a^4
```

maxima [B] time = 0.93, size = 2781, normalized size = 12.25

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] 1/16384*((cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + sin(1/4*
arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2*cos(1/4*arctan2(sin(8*d*
x + 8*c), cos(8*d*x + 8*c))) + 1)^(3/4)*(((1300*I*sqrt(2)*cos(8*d*x + 8*c)
+ 1300*sqrt(2)*sin(8*d*x + 8*c))*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*
x + 8*c)))^2 + (1300*I*sqrt(2)*cos(8*d*x + 8*c) + 1300*sqrt(2)*sin(8*d*x +
8*c))*sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + (2600*I*sqrt
(2)*cos(8*d*x + 8*c) + 2600*sqrt(2)*sin(8*d*x + 8*c))*cos(1/4*arctan2(sin(8
*d*x + 8*c), cos(8*d*x + 8*c))) + 1300*I*sqrt(2)*cos(8*d*x + 8*c) + 1300*sq
rt(2)*sin(8*d*x + 8*c))*cos(7/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), c
os(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1
)) + (2572*I*sqrt(2)*cos(8*d*x + 8*c) + 2572*sqrt(2)*sin(8*d*x + 8*c))*cos(
3/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*a
rctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)) - (1300*(sqrt(2)*cos(8*d*
x + 8*c) - I*sqrt(2)*sin(8*d*x + 8*c))*cos(1/4*arctan2(sin(8*d*x + 8*c), co
```

s(8*d*x + 8*c)))^2 + 1300*(sqrt(2)*cos(8*d*x + 8*c) - I*sqrt(2)*sin(8*d*x + 8*c))*sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2600*(sqrt(2)*cos(8*d*x + 8*c) - I*sqrt(2)*sin(8*d*x + 8*c))*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1300*sqrt(2)*cos(8*d*x + 8*c) - 1300*I*sqrt(2)*sin(8*d*x + 8*c))*sin(7/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)) - 2572*(sqrt(2)*cos(8*d*x + 8*c) - I*sqrt(2)*sin(8*d*x + 8*c))*sin(3/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)))*sqrt(a) + (cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)^(1/4)*(((-3060*I*sqrt(2)*cos(8*d*x + 8*c) - 3060*sqrt(2)*sin(8*d*x + 8*c))*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + (-3060*I*sqrt(2)*cos(8*d*x + 8*c) - 3060*sqrt(2)*sin(8*d*x + 8*c))*sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + (-6120*I*sqrt(2)*cos(8*d*x + 8*c) - 6120*sqrt(2)*sin(8*d*x + 8*c))*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) - 3060*I*sqrt(2)*cos(8*d*x + 8*c) - 3060*sqrt(2)*sin(8*d*x + 8*c))*cos(5/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)) + (-748*I*sqrt(2)*cos(8*d*x + 8*c) - 748*sqrt(2)*sin(8*d*x + 8*c) - 512*I*sqrt(2))*cos(1/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)) + (3060*(sqrt(2)*cos(8*d*x + 8*c) - I*sqrt(2)*sin(8*d*x + 8*c))*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 3060*(sqrt(2)*cos(8*d*x + 8*c) - I*sqrt(2)*sin(8*d*x + 8*c))*sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 6120*(sqrt(2)*cos(8*d*x + 8*c) - I*sqrt(2)*sin(8*d*x + 8*c))*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 3060*sqrt(2)*cos(8*d*x + 8*c) - 3060*I*sqrt(2)*sin(8*d*x + 8*c))*sin(5/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)) + 4*(187*sqrt(2)*cos(8*d*x + 8*c) - 187*I*sqrt(2)*sin(8*d*x + 8*c) + 128*sqrt(2))*sin(1/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)))*sqrt(a) - (630*sqrt(2)*arctan2((cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)^(1/4)*sin(1/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)), (cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)) + 1) - 630*sqrt(2)*arctan2((cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)^(1/4)*sin(1/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)), (cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)) - 1) - 315*I*sqrt(2)*log(sqrt(cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)*cos(1/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1))^2 + sqrt(cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)*sin(1/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1))^2 + 2*(cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x

```
+ 8*c)))^2 + 2*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)^(1
/4)*cos(1/2*arctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), c
os(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)) + 1) + 315*I*sqrt
(2)*log(sqrt(cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + sin(1
/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2*cos(1/4*arctan2(sin(8
*d*x + 8*c), cos(8*d*x + 8*c))) + 1)*cos(1/2*arctan2(sin(1/4*arctan2(sin(8*
d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x
 + 8*c))) + 1))^2 + sqrt(cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)
))^2 + sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2*cos(1/4*a
rctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)*sin(1/2*arctan2(sin(1/4*ar
ctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2(sin(8*d*x + 8*c
), cos(8*d*x + 8*c))) + 1))^2 - 2*(cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*
d*x + 8*c)))^2 + sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c)))^2 + 2
*cos(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)^(1/4)*cos(1/2*ar
ctan2(sin(1/4*arctan2(sin(8*d*x + 8*c), cos(8*d*x + 8*c))), cos(1/4*arctan2
(sin(8*d*x + 8*c), cos(8*d*x + 8*c))) + 1)) + 1))*sqrt(a))/(a^4*d)
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\cos (c+d\,x)}{{\left(a+a\,\tan (c+d\,x)\,1{}\mathrm{i}\right)}^{7/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)/(a + a*tan(c + d*x)*1i)^(7/2),x)
```

```
[Out] int(cos(c + d*x)/(a + a*tan(c + d*x)*1i)^(7/2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.393 $\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=307

$$\frac{3003i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{16384\sqrt{2}a^{7/2}d}-\frac{1001i\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{10240a^4d}-\frac{3003i\cos(c+dx)\sqrt{a+ia\tan(c+dx)}}{16384a^4d}$$

```
[Out] 3003/32768*I*arctanh(1/2*sec(d*x+c)*a^(1/2)*2^(1/2)/(a+I*a*tan(d*x+c))^(1/2
))/a^(7/2)/d*2^(1/2)+1001/8192*I*cos(d*x+c)/a^3/d/(a+I*a*tan(d*x+c))^(1/2)+
429/5120*I*cos(d*x+c)^3/a^3/d/(a+I*a*tan(d*x+c))^(1/2)-3003/16384*I*cos(d*x
+c)*(a+I*a*tan(d*x+c))^(1/2)/a^4/d-1001/10240*I*cos(d*x+c)^3*(a+I*a*tan(d*x
+c))^(1/2)/a^4/d+1/10*I*cos(d*x+c)^3/d/(a+I*a*tan(d*x+c))^(7/2)+13/160*I*co
s(d*x+c)^3/a/d/(a+I*a*tan(d*x+c))^(5/2)+143/1920*I*cos(d*x+c)^3/a^2/d/(a+I*
a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.52, antiderivative size = 307, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = {3502, 3497, 3490, 3489, 206}

$$-\frac{1001i\cos^3(c+dx)\sqrt{a+ia\tan(c+dx)}}{10240a^4d}+\frac{429i\cos^3(c+dx)}{5120a^3d\sqrt{a+ia\tan(c+dx)}}+\frac{143i\cos^3(c+dx)}{1920a^2d(a+ia\tan(c+dx))^{3/2}}-\frac{3003i\cos}{}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (((3003*I)/16384)*ArcTanh[(Sqrt[a]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a + I*a*Tan[
c + d*x]])])/(Sqrt[2]*a^(7/2)*d) + ((I/10)*Cos[c + d*x]^3)/(d*(a + I*a*Tan[
c + d*x])^(7/2)) + (((13*I)/160)*Cos[c + d*x]^3)/(a*d*(a + I*a*Tan[c + d*x]
)^(5/2)) + (((143*I)/1920)*Cos[c + d*x]^3)/(a^2*d*(a + I*a*Tan[c + d*x])^(3
/2)) + (((1001*I)/8192)*Cos[c + d*x])/(a^3*d*Sqrt[a + I*a*Tan[c + d*x]]) +
(((429*I)/5120)*Cos[c + d*x]^3)/(a^3*d*Sqrt[a + I*a*Tan[c + d*x]]) - (((300
3*I)/16384)*Cos[c + d*x]*Sqrt[a + I*a*Tan[c + d*x]])/(a^4*d) - (((1001*I)/1
0240)*Cos[c + d*x]^3*Sqrt[a + I*a*Tan[c + d*x]])/(a^4*d)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3489

```
Int[sec[(e_.) + (f_.)*(x_)]/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]], x_S
ymbol] :> Dist[(-2*a)/(b*f), Subst[Int[1/(2 - a*x^2), x], x, Sec[e + f*x]/S
qrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3490

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] + Dist[a/(2*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b*Tan[e +
f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] &&
EqQ[m/2 + n, 0] && GtQ[n, 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
```

```
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx))^{7/2}}\,dx = \frac{i\cos^3(c+dx)}{10d(a+ia\tan(c+dx))^{7/2}} + \frac{13\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx))^{5/2}}\,dx}{20a}$$

$$= \frac{i\cos^3(c+dx)}{10d(a+ia\tan(c+dx))^{7/2}} + \frac{13i\cos^3(c+dx)}{160ad(a+ia\tan(c+dx))^{5/2}} + \frac{143\int \frac{\cos^3(c+dx)}{(a+ia\tan(c+dx)}}{320a^2}$$

$$= \frac{i\cos^3(c+dx)}{10d(a+ia\tan(c+dx))^{7/2}} + \frac{13i\cos^3(c+dx)}{160ad(a+ia\tan(c+dx))^{5/2}} + \frac{143i\cos^3(c}{1920a^2d(a+ia\tan}$$

$$= \frac{i\cos^3(c+dx)}{10d(a+ia\tan(c+dx))^{7/2}} + \frac{13i\cos^3(c+dx)}{160ad(a+ia\tan(c+dx))^{5/2}} + \frac{143i\cos^3(c}{1920a^2d(a+ia\tan}$$

$$= \frac{i\cos^3(c+dx)}{10d(a+ia\tan(c+dx))^{7/2}} + \frac{13i\cos^3(c+dx)}{160ad(a+ia\tan(c+dx))^{5/2}} + \frac{143i\cos^3(c}{1920a^2d(a+ia\tan}$$

$$= \frac{i\cos^3(c+dx)}{10d(a+ia\tan(c+dx))^{7/2}} + \frac{13i\cos^3(c+dx)}{160ad(a+ia\tan(c+dx))^{5/2}} + \frac{143i\cos^3(c}{1920a^2d(a+ia\tan}$$

$$= \frac{i\cos^3(c+dx)}{10d(a+ia\tan(c+dx))^{7/2}} + \frac{13i\cos^3(c+dx)}{160ad(a+ia\tan(c+dx))^{5/2}} + \frac{143i\cos^3(c}{1920a^2d(a+ia\tan}$$

$$= \frac{i\cos^3(c+dx)}{10d(a+ia\tan(c+dx))^{7/2}} + \frac{13i\cos^3(c+dx)}{160ad(a+ia\tan(c+dx))^{5/2}} + \frac{143i\cos^3(c}{1920a^2d(a+ia\tan}$$

$$= \frac{3003i\tanh^{-1}\left(\frac{\sqrt{a}\sec(c+dx)}{\sqrt{2}\sqrt{a+ia\tan(c+dx)}}\right)}{16384\sqrt{2}a^{7/2}d} + \frac{i\cos^3(c+dx)}{10d(a+ia\tan(c+dx))^{7/2}} + \frac{13i\cos^3(}{160ad(a+ia\,t}$$

Mathematica [A] time = 2.49, size = 175, normalized size = 0.57

$$-\frac{\sec^3(c+dx)\left(20048e^{-2i(c+dx)} + 71190e^{2i(c+dx)} + 5856e^{-4i(c+dx)} - 48640e^{4i(c+dx)} + 768e^{-6i(c+dx)} - 2560e^{6i(c+dx)}\right.}{491520a^3d(\tan(c+dx)-i)^3\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3/(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] -1/491520*((42140 + 20048/E^((2*I)*(c + d*x)) + 71190*E^((2*I)*(c + d*x)) +
 5856/E^((4*I)*(c + d*x)) - 48640*E^((4*I)*(c + d*x)) + 768/E^((6*I)*(c + d
*x)) - 2560*E^((6*I)*(c + d*x)) + (90090*E^((4*I)*(c + d*x))*ArcTanh[Sqrt[1
```

```
+ E^((2*I)*(c + d*x))]])/Sqrt[1 + E^((2*I)*(c + d*x))])*Sec[c + d*x]^3)/(a
^3*d*(-I + Tan[c + d*x])^3*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.61, size = 322, normalized size = 1.05

$$\left(45045i\sqrt{\frac{1}{2}}a^4d\sqrt{\frac{1}{a^7d^2}}e^{(10i\,dx+10i\,c)}\log\left(\frac{\left(\sqrt{2}\sqrt{\frac{1}{2}}\left(24600576i\,a^3de^{(2i\,dx+2i\,c)}+24600576i\,a^3d\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{1}{a^7d^2}}+24600576i\right)e^{(-i\,dx-i\,c)}}{67108864\,a^3d}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/491520*(45045*I*sqrt(1/2)*a^4*d*sqrt(1/(a^7*d^2))*e^(10*I*d*x + 10*I*c)*l
og(1/67108864*(sqrt(2)*sqrt(1/2)*(24600576*I*a^3*d*e^(2*I*d*x + 2*I*c) + 24
600576*I*a^3*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(1/(a^7*d^2)) + 24600
576*I)*e^(-I*d*x - I*c)/(a^3*d)) - 45045*I*sqrt(1/2)*a^4*d*sqrt(1/(a^7*d^2)
)*e^(10*I*d*x + 10*I*c)*log(1/67108864*(sqrt(2)*sqrt(1/2)*(-24600576*I*a^3*
d*e^(2*I*d*x + 2*I*c) - 24600576*I*a^3*d)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))
*sqrt(1/(a^7*d^2)) + 24600576*I)*e^(-I*d*x - I*c)/(a^3*d)) + sqrt(2)*sqrt(a
/(e^(2*I*d*x + 2*I*c) + 1))*(-1280*I*e^(14*I*d*x + 14*I*c) - 25600*I*e^(12*
I*d*x + 12*I*c) + 11275*I*e^(10*I*d*x + 10*I*c) + 56665*I*e^(8*I*d*x + 8*I*
c) + 31094*I*e^(6*I*d*x + 6*I*c) + 12952*I*e^(4*I*d*x + 4*I*c) + 3312*I*e^(
2*I*d*x + 2*I*c) + 384*I))*e^(-10*I*d*x - 10*I*c)/(a^4*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos(dx+c)^3}{(i\,a\tan(dx+c)+a)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate(cos(d*x + c)^3/(I*a*tan(d*x + c) + a)^(7/2), x)
```

maple [A] time = 1.45, size = 427, normalized size = 1.39

$$\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(786432i\left(\cos^{11}(dx+c)\right)+786432\sin(dx+c)\left(\cos^{10}(dx+c)\right)-466944i\left(\cos^{9}(dx+c)\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] 1/983040/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(786432*I*cos(d*x
+c)^11+786432*sin(d*x+c)*cos(d*x+c)^10-466944*I*cos(d*x+c)^9-73728*sin(d*x+
c)*cos(d*x+c)^8+5120*I*cos(d*x+c)^7+66560*sin(d*x+c)*cos(d*x+c)^6+9152*I*co
s(d*x+c)^5+45045*I*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2)*arctan(1/2*
(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)
*2^(1/2))*cos(d*x+c)+82368*sin(d*x+c)*cos(d*x+c)^4+45045*I*(-2*cos(d*x+c)/(
1+cos(d*x+c)))^(1/2)*2^(1/2)*arctan(1/2*(I*cos(d*x+c)-I+sin(d*x+c))/sin(d*x
+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/2))+24024*I*cos(d*x+c)^3+4504
5*2^(1/2)*sin(d*x+c)*(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*arctan(1/2*(I*cos
(d*x+c)-I+sin(d*x+c))/sin(d*x+c)/(-2*cos(d*x+c)/(1+cos(d*x+c)))^(1/2)*2^(1/
2))+120120*cos(d*x+c)^2*sin(d*x+c)-180180*I*cos(d*x+c))/a^4
```

maxima [B] time = 1.64, size = 5803, normalized size = 18.90

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] 1/1966080*((cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + si
n(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + 2*cos(1/5*arctan
2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + 1)^(3/4)*(((3160*I*sqrt(2)*cos
(10*d*x + 10*c) + 3160*sqrt(2)*sin(10*d*x + 10*c))*cos(1/5*arctan2(sin(10*d
*x + 10*c), cos(10*d*x + 10*c)))^2 + (3160*I*sqrt(2)*cos(10*d*x + 10*c) + 3
160*sqrt(2)*sin(10*d*x + 10*c))*sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10*
d*x + 10*c)))^2 + (33480*I*sqrt(2)*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(
10*d*x + 10*c)))^2 + 33480*I*sqrt(2)*sin(1/5*arctan2(sin(10*d*x + 10*c), co
s(10*d*x + 10*c)))^2 + 66960*I*sqrt(2)*cos(1/5*arctan2(sin(10*d*x + 10*c),
cos(10*d*x + 10*c))) + 33480*I*sqrt(2))*cos(4/5*arctan2(sin(10*d*x + 10*c),
 cos(10*d*x + 10*c))) + (6320*I*sqrt(2)*cos(10*d*x + 10*c) + 6320*sqrt(2)*s
in(10*d*x + 10*c))*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))
 + 33480*(sqrt(2)*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^
2 + sqrt(2)*sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + 2*
sqrt(2)*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + sqrt(2))
*sin(4/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + 3160*I*sqrt(2)*
cos(10*d*x + 10*c) + 3160*sqrt(2)*sin(10*d*x + 10*c))*cos(7/2*arctan2(sin(1
/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))), cos(1/5*arctan2(sin(10
*d*x + 10*c), cos(10*d*x + 10*c))) + 1)) + (1960*I*sqrt(2)*cos(10*d*x + 10*
c) + 46200*I*sqrt(2)*cos(4/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)
)) - 130560*I*sqrt(2)*cos(3/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c
))) + 24960*I*sqrt(2)*cos(2/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c
))) + 1960*sqrt(2)*sin(10*d*x + 10*c) + 46200*sqrt(2)*sin(4/5*arctan2(sin(1
0*d*x + 10*c), cos(10*d*x + 10*c))) - 130560*sqrt(2)*sin(3/5*arctan2(sin(10
*d*x + 10*c), cos(10*d*x + 10*c))) + 24960*sqrt(2)*sin(2/5*arctan2(sin(10*d
*x + 10*c), cos(10*d*x + 10*c))) - 5120*I*sqrt(2))*cos(3/2*arctan2(sin(1/5*
arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))), cos(1/5*arctan2(sin(10*d*
x + 10*c), cos(10*d*x + 10*c))) + 1)) - (3160*(sqrt(2)*cos(10*d*x + 10*c) -
 I*sqrt(2)*sin(10*d*x + 10*c))*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d
*x + 10*c)))^2 + 3160*(sqrt(2)*cos(10*d*x + 10*c) - I*sqrt(2)*sin(10*d*x +
10*c))*sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + 33480*(
sqrt(2)*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + sqrt(2
)*sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + 2*sqrt(2)*co
s(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + sqrt(2))*cos(4/5*a
rctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + 6320*(sqrt(2)*cos(10*d*x
+ 10*c) - I*sqrt(2)*sin(10*d*x + 10*c))*cos(1/5*arctan2(sin(10*d*x + 10*c),
 cos(10*d*x + 10*c))) - (33480*I*sqrt(2)*cos(1/5*arctan2(sin(10*d*x + 10*c)
, cos(10*d*x + 10*c)))^2 + 33480*I*sqrt(2)*sin(1/5*arctan2(sin(10*d*x + 10*
c), cos(10*d*x + 10*c)))^2 + 66960*I*sqrt(2)*cos(1/5*arctan2(sin(10*d*x + 1
0*c), cos(10*d*x + 10*c))) + 33480*I*sqrt(2))*sin(4/5*arctan2(sin(10*d*x +
10*c), cos(10*d*x + 10*c))) + 3160*sqrt(2)*cos(10*d*x + 10*c) - 3160*I*sqrt
(2)*sin(10*d*x + 10*c))*sin(7/2*arctan2(sin(1/5*arctan2(sin(10*d*x + 10*c),
 cos(10*d*x + 10*c))), cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*
c))) + 1)) - (1960*sqrt(2)*cos(10*d*x + 10*c) + 46200*sqrt(2)*cos(4/5*arcta
n2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) - 130560*sqrt(2)*cos(3/5*arctan
2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + 24960*sqrt(2)*cos(2/5*arctan2(
sin(10*d*x + 10*c), cos(10*d*x + 10*c))) - 1960*I*sqrt(2)*sin(10*d*x + 10*c
) - 46200*I*sqrt(2)*sin(4/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))
) + 130560*I*sqrt(2)*sin(3/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)
)) - 24960*I*sqrt(2)*sin(2/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)
)) - 5120*sqrt(2))*sin(3/2*arctan2(sin(1/5*arctan2(sin(10*d*x + 10*c), cos(
10*d*x + 10*c))), cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))
+ 1)))*sqrt(a) + (cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^
2 + sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + 2*cos(1/5*
arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + 1)^(1/4)*(((420*I*sqrt(2
)*cos(10*d*x + 10*c) + 420*sqrt(2)*sin(10*d*x + 10*c))*cos(1/5*arctan2(sin(
```

```
10*d*x + 10*c), cos(10*d*x + 10*c)))^4 + (420*I*sqrt(2)*cos(10*d*x + 10*c)
+ 420*sqrt(2)*sin(10*d*x + 10*c))*sin(1/5*arctan2(sin(10*d*x + 10*c), cos(1
0*d*x + 10*c)))^4 + (1680*I*sqrt(2)*cos(10*d*x + 10*c) + 1680*sqrt(2)*sin(1
0*d*x + 10*c))*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^3 +
 (2520*I*sqrt(2)*cos(10*d*x + 10*c) + 2520*sqrt(2)*sin(10*d*x + 10*c))*cos(
1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + ((840*I*sqrt(2)*co
s(10*d*x + 10*c) + 840*sqrt(2)*sin(10*d*x + 10*c))*cos(1/5*arctan2(sin(10*d
*x + 10*c), cos(10*d*x + 10*c)))^2 + (1680*I*sqrt(2)*cos(10*d*x + 10*c) + 1
680*sqrt(2)*sin(10*d*x + 10*c))*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*
d*x + 10*c))) + 840*I*sqrt(2)*cos(10*d*x + 10*c) + 840*sqrt(2)*sin(10*d*x +
 10*c))*sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + (1680*
I*sqrt(2)*cos(10*d*x + 10*c) + 1680*sqrt(2)*sin(10*d*x + 10*c))*cos(1/5*arc
tan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + 420*I*sqrt(2)*cos(10*d*x +
10*c) + 420*sqrt(2)*sin(10*d*x + 10*c))*cos(9/2*arctan2(sin(1/5*arctan2(sin
(10*d*x + 10*c), cos(10*d*x + 10*c))), cos(1/5*arctan2(sin(10*d*x + 10*c),
cos(10*d*x + 10*c))) + 1)) + ((-3584*I*sqrt(2)*cos(10*d*x + 10*c) - 3584*sq
rt(2)*sin(10*d*x + 10*c))*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x +
10*c)))^2 + (-3584*I*sqrt(2)*cos(10*d*x + 10*c) - 3584*sqrt(2)*sin(10*d*x +
 10*c))*sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + (-6132
0*I*sqrt(2)*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 - 61
320*I*sqrt(2)*sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 -
122640*I*sqrt(2)*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) -
 61320*I*sqrt(2))*cos(4/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))
+ (83520*I*sqrt(2)*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))
^2 + 83520*I*sqrt(2)*sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)
))^2 + 167040*I*sqrt(2)*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10
*c))) + 83520*I*sqrt(2))*cos(3/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 1
0*c))) + (-7168*I*sqrt(2)*cos(10*d*x + 10*c) - 7168*sqrt(2)*sin(10*d*x + 10
*c))*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) - 61320*(sqrt
(2)*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + sqrt(2)*si
n(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + 2*sqrt(2)*cos(1/
5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + sqrt(2))*sin(4/5*arcta
n2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + 83520*(sqrt(2)*cos(1/5*arctan
2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + sqrt(2)*sin(1/5*arctan2(sin(
10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + 2*sqrt(2)*cos(1/5*arctan2(sin(10*d
*x + 10*c), cos(10*d*x + 10*c))) + sqrt(2))*sin(3/5*arctan2(sin(10*d*x + 10
*c), cos(10*d*x + 10*c))) - 3584*I*sqrt(2)*cos(10*d*x + 10*c) - 3584*sqrt(2
)*sin(10*d*x + 10*c))*cos(5/2*arctan2(sin(1/5*arctan2(sin(10*d*x + 10*c), c
os(10*d*x + 10*c))), cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)
)) + 1)) + (-420*I*sqrt(2)*cos(10*d*x + 10*c) - 12600*I*sqrt(2)*cos(4/5*arc
tan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + 54720*I*sqrt(2)*cos(3/5*arc
tan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) - 21120*I*sqrt(2)*cos(2/5*arc
tan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) - 420*sqrt(2)*sin(10*d*x + 10
*c) - 12600*sqrt(2)*sin(4/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))
) + 54720*sqrt(2)*sin(3/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))
- 21120*sqrt(2)*sin(2/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) -
92160*I*sqrt(2))*cos(1/2*arctan2(sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10
*d*x + 10*c))), cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) +
1)) - 420*((sqrt(2)*cos(10*d*x + 10*c) - I*sqrt(2)*sin(10*d*x + 10*c))*cos(
1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^4 + (sqrt(2)*cos(10*d*
x + 10*c) - I*sqrt(2)*sin(10*d*x + 10*c))*sin(1/5*arctan2(sin(10*d*x + 10*c
), cos(10*d*x + 10*c)))^4 + 4*(sqrt(2)*cos(10*d*x + 10*c) - I*sqrt(2)*sin(1
0*d*x + 10*c))*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^3 +
 6*(sqrt(2)*cos(10*d*x + 10*c) - I*sqrt(2)*sin(10*d*x + 10*c))*cos(1/5*arct
an2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + 2*((sqrt(2)*cos(10*d*x + 1
0*c) - I*sqrt(2)*sin(10*d*x + 10*c))*cos(1/5*arctan2(sin(10*d*x + 10*c), co
s(10*d*x + 10*c)))^2 + 2*(sqrt(2)*cos(10*d*x + 10*c) - I*sqrt(2)*sin(10*d*x
 + 10*c))*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + sqrt(2
)*cos(10*d*x + 10*c) - I*sqrt(2)*sin(10*d*x + 10*c))*sin(1/5*arctan2(sin(10
```

```
*d*x + 10*c), cos(10*d*x + 10*c)))^2 + 4*(sqrt(2)*cos(10*d*x + 10*c) - I*sq
rt(2)*sin(10*d*x + 10*c))*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x +
10*c))) + sqrt(2)*cos(10*d*x + 10*c) - I*sqrt(2)*sin(10*d*x + 10*c))*sin(9/
2*arctan2(sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))), cos(1/5
*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + 1)) + (3584*(sqrt(2)*co
s(10*d*x + 10*c) - I*sqrt(2)*sin(10*d*x + 10*c))*cos(1/5*arctan2(sin(10*d*x
 + 10*c), cos(10*d*x + 10*c)))^2 + 3584*(sqrt(2)*cos(10*d*x + 10*c) - I*sqr
t(2)*sin(10*d*x + 10*c))*sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 1
0*c)))^2 + 61320*(sqrt(2)*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x +
10*c)))^2 + sqrt(2)*sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))
)^2 + 2*sqrt(2)*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) +
sqrt(2))*cos(4/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) - 83520*(
sqrt(2)*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + sqrt(2
)*sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + 2*sqrt(2)*co
s(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + sqrt(2))*cos(3/5*a
rctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + 7168*(sqrt(2)*cos(10*d*x
+ 10*c) - I*sqrt(2)*sin(10*d*x + 10*c))*cos(1/5*arctan2(sin(10*d*x + 10*c),
 cos(10*d*x + 10*c))) + (-61320*I*sqrt(2)*cos(1/5*arctan2(sin(10*d*x + 10*c
), cos(10*d*x + 10*c)))^2 - 61320*I*sqrt(2)*sin(1/5*arctan2(sin(10*d*x + 10
*c), cos(10*d*x + 10*c)))^2 - 122640*I*sqrt(2)*cos(1/5*arctan2(sin(10*d*x +
 10*c), cos(10*d*x + 10*c))) - 61320*I*sqrt(2))*sin(4/5*arctan2(sin(10*d*x
+ 10*c), cos(10*d*x + 10*c))) + (83520*I*sqrt(2)*cos(1/5*arctan2(sin(10*d*x
 + 10*c), cos(10*d*x + 10*c)))^2 + 83520*I*sqrt(2)*sin(1/5*arctan2(sin(10*d
*x + 10*c), cos(10*d*x + 10*c)))^2 + 167040*I*sqrt(2)*cos(1/5*arctan2(sin(1
0*d*x + 10*c), cos(10*d*x + 10*c))) + 83520*I*sqrt(2))*sin(3/5*arctan2(sin(
10*d*x + 10*c), cos(10*d*x + 10*c))) + 3584*sqrt(2)*cos(10*d*x + 10*c) - 35
84*I*sqrt(2)*sin(10*d*x + 10*c))*sin(5/2*arctan2(sin(1/5*arctan2(sin(10*d*x
 + 10*c), cos(10*d*x + 10*c))), cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*
d*x + 10*c))) + 1)) + (420*sqrt(2)*cos(10*d*x + 10*c) + 12600*sqrt(2)*cos(4
/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) - 54720*sqrt(2)*cos(3/5
*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + 21120*sqrt(2)*cos(2/5*a
rctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) - 420*I*sqrt(2)*sin(10*d*x
+ 10*c) - 12600*I*sqrt(2)*sin(4/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x +
10*c))) + 54720*I*sqrt(2)*sin(3/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x +
10*c))) - 21120*I*sqrt(2)*sin(2/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x +
10*c))) + 92160*sqrt(2))*sin(1/2*arctan2(sin(1/5*arctan2(sin(10*d*x + 10*c)
, cos(10*d*x + 10*c))), cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10
*c))) + 1)))*sqrt(a) - (90090*sqrt(2)*arctan2((cos(1/5*arctan2(sin(10*d*x +
 10*c), cos(10*d*x + 10*c)))^2 + sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10
*d*x + 10*c)))^2 + 2*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)
)) + 1)^(1/4)*sin(1/2*arctan2(sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*
x + 10*c))), cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + 1))
, (cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + sin(1/5*arc
tan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + 2*cos(1/5*arctan2(sin(10*
d*x + 10*c), cos(10*d*x + 10*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(1/5*arctan
2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))), cos(1/5*arctan2(sin(10*d*x + 10
*c), cos(10*d*x + 10*c))) + 1)) + 1) - 90090*sqrt(2)*arctan2((cos(1/5*arcta
n2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + sin(1/5*arctan2(sin(10*d*x
+ 10*c), cos(10*d*x + 10*c)))^2 + 2*cos(1/5*arctan2(sin(10*d*x + 10*c), cos
(10*d*x + 10*c))) + 1)^(1/4)*sin(1/2*arctan2(sin(1/5*arctan2(sin(10*d*x + 1
0*c), cos(10*d*x + 10*c))), cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x
+ 10*c))) + 1)), (cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^
2 + sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + 2*cos(1/5*
arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + 1)^(1/4)*cos(1/2*arctan2
(sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))), cos(1/5*arctan2(
sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + 1)) - 1) - 45045*I*sqrt(2)*log(s
qrt(cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + sin(1/5*ar
ctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + 2*cos(1/5*arctan2(sin(10
*d*x + 10*c), cos(10*d*x + 10*c))) + 1)*cos(1/2*arctan2(sin(1/5*arctan2(sin
```

```
(10*d*x + 10*c), cos(10*d*x + 10*c))), cos(1/5*arctan2(sin(10*d*x + 10*c),
cos(10*d*x + 10*c))) + 1))^2 + sqrt(cos(1/5*arctan2(sin(10*d*x + 10*c), cos
(10*d*x + 10*c)))^2 + sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c
)))^2 + 2*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + 1)*sin
(1/2*arctan2(sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))), cos(
1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + 1))^2 + 2*(cos(1/5*a
rctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + sin(1/5*arctan2(sin(10*
d*x + 10*c), cos(10*d*x + 10*c)))^2 + 2*cos(1/5*arctan2(sin(10*d*x + 10*c),
 cos(10*d*x + 10*c))) + 1)^(1/4)*cos(1/2*arctan2(sin(1/5*arctan2(sin(10*d*x
 + 10*c), cos(10*d*x + 10*c))), cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*
d*x + 10*c))) + 1)) + 1) + 45045*I*sqrt(2)*log(sqrt(cos(1/5*arctan2(sin(10*
d*x + 10*c), cos(10*d*x + 10*c)))^2 + sin(1/5*arctan2(sin(10*d*x + 10*c), c
os(10*d*x + 10*c)))^2 + 2*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x +
10*c))) + 1)*cos(1/2*arctan2(sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x
 + 10*c))), cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + 1))^
2 + sqrt(cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + sin(1
/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c)))^2 + 2*cos(1/5*arctan2(s
in(10*d*x + 10*c), cos(10*d*x + 10*c))) + 1)*sin(1/2*arctan2(sin(1/5*arctan
2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))), cos(1/5*arctan2(sin(10*d*x + 10
*c), cos(10*d*x + 10*c))) + 1))^2 - 2*(cos(1/5*arctan2(sin(10*d*x + 10*c),
cos(10*d*x + 10*c)))^2 + sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 1
0*c)))^2 + 2*cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + 1)^
(1/4)*cos(1/2*arctan2(sin(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c
))), cos(1/5*arctan2(sin(10*d*x + 10*c), cos(10*d*x + 10*c))) + 1)) + 1))*s
qrt(a))/(a^4*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\cos (c + d x)^3}{(a + a \tan (c + d x) \, 1\mathrm{i})^{7/2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3/(a + a*tan(c + d*x)*1i)^(7/2),x)
[Out] int(cos(c + d*x)^3/(a + a*tan(c + d*x)*1i)^(7/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3/(a+I*a*tan(d*x+c))**(7/2),x)
[Out] Timed out
```

3.394 $\int (e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=524

$$-\frac{ia^{3/2}e^{3/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}+\frac{ia^{3/2}e^{3/2}\sec(c+dx)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}+\frac{ia^{3}}{}$$

```
[Out] I*a*(e*sec(d*x+c))^(3/2)/d/(a+I*a*tan(d*x+c))^(1/2)-1/2*I*a^(3/2)*e^(3/2)*a
rctan(1-2^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*sec(d*x+c))^(1/
2))*sec(d*x+c)/d*2^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)+
1/2*I*a^(3/2)*e^(3/2)*arctan(1+2^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/a^(
1/2)/(e*sec(d*x+c))^(1/2))*sec(d*x+c)/d*2^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a
+I*a*tan(d*x+c))^(1/2)+1/4*I*a^(3/2)*e^(3/2)*ln(a-2^(1/2)*a^(1/2)*e^(1/2)*(
a-I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2)+cos(d*x+c)*(a-I*a*tan(d*x+c)))
*sec(d*x+c)/d*2^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)-1/4
*I*a^(3/2)*e^(3/2)*ln(a+2^(1/2)*a^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/(e
*sec(d*x+c))^(1/2)+cos(d*x+c)*(a-I*a*tan(d*x+c)))*sec(d*x+c)/d*2^(1/2)/(a-I
*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)
```

Rubi [A] time = 0.45, antiderivative size = 524, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.300$, Rules used = {3498, 3499, 3495, 297, 1162, 617, 204, 1165, 628}

$$-\frac{ia^{3/2}e^{3/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}+\frac{ia^{3/2}e^{3/2}\sec(c+dx)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}+\frac{ia^{3}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(3/2)*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (I*a*(e*Sec[c + d*x])^(3/2))/(d*Sqrt[a + I*a*Tan[c + d*x]]) - (I*a^(3/2)*e^
(3/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])/(Sqrt[a]*Sqrt
[e*Sec[c + d*x]])]*Sec[c + d*x])/(Sqrt[2]*d*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt
[a + I*a*Tan[c + d*x]]) + (I*a^(3/2)*e^(3/2)*ArcTan[1 + (Sqrt[2]*Sqrt[e]*Sq
rt[a - I*a*Tan[c + d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])]*Sec[c + d*x])/(Sq
rt[2]*d*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) + ((I/2)*a^(
3/2)*e^(3/2)*Log[a - (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])/S
qrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a - I*a*Tan[c + d*x])]*Sec[c + d*x])/(S
qrt[2]*d*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) - ((I/2)*a^
(3/2)*e^(3/2)*Log[a + (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])/
Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a - I*a*Tan[c + d*x])]*Sec[c + d*x])/(
Sqrt[2]*d*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3495

```
Int[Sqrt[(d_.)*sec[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[(-4*b*d^2)/f, Subst[Int[x^2/(a^2 + d^2*x^4), x],
 x, Sqrt[a + b*Tan[e + f*x]]/Sqrt[d*Sec[e + f*x]]], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3498

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m}, x] && EqQ[a^2 + b^2, 0] && GtQ[n, 0] && NeQ[m + n - 1, 0] && IntegersQ[
2*m, 2*n]
```

Rule 3499

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(3/2)/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_
.)*(x_)]], x_Symbol] :> Dist[(d*Sec[e + f*x])/(Sqrt[a - b*Tan[e + f*x]]*Sqr
t[a + b*Tan[e + f*x]]), Int[Sqrt[d*Sec[e + f*x]]*Sqrt[a - b*Tan[e + f*x]],
x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}\,dx = \frac{ia(e\sec(c+dx))^{3/2}}{d\sqrt{a+ia\tan(c+dx)}} + \frac{1}{2}a\int \frac{(e\sec(c+dx))^{3/2}}{\sqrt{a+ia\tan(c+dx)}}\,dx$$
$$= \frac{ia(e\sec(c+dx))^{3/2}}{d\sqrt{a+ia\tan(c+dx)}} + \frac{(ae\sec(c+dx))\int\sqrt{e\sec(c+dx)}\,\sqrt{a-i}}{2\sqrt{a-ia\tan(c+dx)}\,\sqrt{a+ia\tan}}$$
$$= \frac{ia(e\sec(c+dx))^{3/2}}{d\sqrt{a+ia\tan(c+dx)}} + \frac{\left(2ia^2e^3\sec(c+dx)\right)\mathrm{Subst}\left(\int\frac{x^2}{a^2+e^2x^4}\,dx\right.}{d\sqrt{a-ia\tan(c+dx)}\,\sqrt{a+ia\tan}}$$
$$= \frac{ia(e\sec(c+dx))^{3/2}}{d\sqrt{a+ia\tan(c+dx)}} - \frac{\left(ia^2e^2\sec(c+dx)\right)\mathrm{Subst}\left(\int\frac{a-ex^2}{a^2+e^2x^4}\,dx,\right.}{d\sqrt{a-ia\tan(c+dx)}\,\sqrt{a+ia\tan}}$$
$$= \frac{ia(e\sec(c+dx))^{3/2}}{d\sqrt{a+ia\tan(c+dx)}} + \frac{\left(ia^2e\sec(c+dx)\right)\mathrm{Subst}\left(\int\frac{1}{\frac{a}{e}-\frac{\sqrt{2}\sqrt{a}x}{\sqrt{e}}+x^2}\right.}{2d\sqrt{a-ia\tan(c+dx)}\,\sqrt{a+ia}}$$
$$= \frac{ia(e\sec(c+dx))^{3/2}}{d\sqrt{a+ia\tan(c+dx)}} + \frac{ia^{3/2}e^{3/2}\log\left(a-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\right.}{2\sqrt{2}\,d\sqrt{a-ia\tan(c}}$$
$$= \frac{ia(e\sec(c+dx))^{3/2}}{d\sqrt{a+ia\tan(c+dx)}} - \frac{ia^{3/2}e^{3/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\,d\sqrt{a-ia\tan(c+dx)}\,\sqrt{a+ia\tan(}}$$

Mathematica [A] time = 1.75, size = 373, normalized size = 0.71

$$\frac{e(\cos(c)-i\sin(c))\sqrt{a+ia\tan(c+dx)}\,\sqrt{e\sec(c+dx)}\left(\sqrt{-\sin(c)-i\cos(c)-1}\,\sqrt{-\sin(c)+i\cos(c)+1}\,\sqrt{\tan}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(3/2)*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (e*Sqrt[e*Sec[c + d*x]]*(Cos[c] - I*Sin[c])*(ArcTanh[(Sqrt[1 + I*Cos[c] - S
in[c]]*Sqrt[I - Tan[(d*x)/2]])/(Sqrt[-1 + I*Cos[c] + Sin[c]]*Sqrt[I + Tan[(
d*x)/2]])]*Cos[c + d*x]*Sqrt[-1 - I*Cos[c] - Sin[c]]*Sqrt[1 + I*Cos[c] - Si
n[c]]*Sqrt[I + Tan[(d*x)/2]] + Sqrt[-1 + I*Cos[c] + Sin[c]]*(Sqrt[-1 - I*Co
s[c] - Sin[c]]*(I*Cos[d*x] + Sin[d*x])*Sqrt[I - Tan[(d*x)/2]] - ArcTanh[(Sq
rt[1 - I*Cos[c] + Sin[c]]*Sqrt[I - Tan[(d*x)/2]])/(Sqrt[-1 - I*Cos[c] - Sin
[c]]*Sqrt[I + Tan[(d*x)/2]])]*Cos[c + d*x]*Sqrt[1 - I*Cos[c] + Sin[c]]*Sqrt
[I + Tan[(d*x)/2]]))*Sqrt[a + I*a*Tan[c + d*x]])/(d*Sqrt[-1 - I*Cos[c] - Si
n[c]]*Sqrt[-1 + I*Cos[c] + Sin[c]]*Sqrt[I - Tan[(d*x)/2]])
```

fricas [A] time = 0.55, size = 418, normalized size = 0.80

$$\frac{4ie\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}e^{\left(\frac{1}{2}idx+\frac{1}{2}ic\right)}+\sqrt{\frac{iae^3}{d^2}}\,d\log\left(\frac{2\left(ee^{(2idx+2ic)}+e\right)\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}e^{\left(\frac{1}{2}idx+\frac{1}{2}ic\right)}+2i\sqrt{\frac{iae^3}{d^2}}}{e}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="frica
s")
```

```
[Out] 1/2*(4*I*e*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) +
1))*e^(1/2*I*d*x + 1/2*I*c) + sqrt(I*a*e^3/d^2)*d*log((2*(e*e^(2*I*d*x + 2*
I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1
))*e^(1/2*I*d*x + 1/2*I*c) + 2*I*sqrt(I*a*e^3/d^2)*d)/e) - sqrt(I*a*e^3/d^2
)*d*log((2*(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sq
rt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) - 2*I*sqrt(I*a*e^3/
d^2)*d)/e) + sqrt(-I*a*e^3/d^2)*d*log(2*((e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a
/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x
+ 1/2*I*c) + I*sqrt(-I*a*e^3/d^2)*d)/e) - sqrt(-I*a*e^3/d^2)*d*log(2*((e*e^
(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x
 + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) - I*sqrt(-I*a*e^3/d^2)*d)/e))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec (dx+c))^{\frac{3}{2}} \sqrt{i a \tan (dx+c)+a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] integrate((e*sec(d*x + c))^(3/2)*sqrt(I*a*tan(d*x + c) + a), x)
```

maple [A] time = 1.37, size = 309, normalized size = 0.59

$$\frac{\left(\frac{e}{\cos(dx+c)}\right)^{\frac{3}{2}} \sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\ \cos(dx+c)\left(-1+\cos(dx+c)\right)^{2}\left(i\cos(dx+c)\operatorname{arctanh}\left(\frac{\sqrt{\frac{1}{1+\cos(dx+c)}}\ (\cos(dx+c)+}{2}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 1/2/d*(e/cos(d*x+c))^(3/2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*c
os(d*x+c)*(-1+cos(d*x+c))^2*(I*cos(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1
/2)*(cos(d*x+c)+1+sin(d*x+c)))-I*cos(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^
(1/2)*(cos(d*x+c)+1-sin(d*x+c)))+2*I*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)-2*
cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)+cos(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)
))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+cos(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)
))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))-2*(1/(1+cos(d*x+c)))^(1/2))/sin(d*x+c)^
3/(I*sin(d*x+c)+cos(d*x+c)-1)/(1/(1+cos(d*x+c)))^(3/2)
```

maxima [B] time = 1.21, size = 1875, normalized size = 3.58

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxim
a")
```

```
[Out] -((16*sqrt(2)*e*cos(2*d*x + 2*c) + 16*I*sqrt(2)*e*sin(2*d*x + 2*c) + 16*sqr
t(2)*e)*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))
) + 1, sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) +
(16*sqrt(2)*e*cos(2*d*x + 2*c) + 16*I*sqrt(2)*e*sin(2*d*x + 2*c) + 16*sqrt(
2)*e)*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
+ 1, -sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (
16*sqrt(2)*e*cos(2*d*x + 2*c) + 16*I*sqrt(2)*e*sin(2*d*x + 2*c) + 16*sqrt(2
)*e)*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) -
```

```
 1, sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (16
*sqrt(2)*e*cos(2*d*x + 2*c) + 16*I*sqrt(2)*e*sin(2*d*x + 2*c) + 16*sqrt(2)*
e)*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 1
, -sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (16*
I*sqrt(2)*e*cos(2*d*x + 2*c) - 16*sqrt(2)*e*sin(2*d*x + 2*c) + 16*I*sqrt(2)
*e)*arctan2(sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) +
sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))), sqrt(2)*cos(1/4*arcta
n2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c))) + 1) + (-16*I*sqrt(2)*e*cos(2*d*x + 2*c) + 16*sqrt(2)*e
*sin(2*d*x + 2*c) - 16*I*sqrt(2)*e)*arctan2(-sqrt(2)*sin(1/4*arctan2(sin(2*
d*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*
x + 2*c))), -sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) +
 cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - 128*e*cos(1/4*
arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + (8*sqrt(2)*e*cos(2*d*x + 2*c
) + 8*I*sqrt(2)*e*sin(2*d*x + 2*c) + 8*sqrt(2)*e)*log(2*sqrt(2)*sin(1/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/4*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c))) + 2*(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*
x + 2*c))) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(
1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*cos(1/4*arctan2(sin(
2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(
2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2
 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (8
*sqrt(2)*e*cos(2*d*x + 2*c) + 8*I*sqrt(2)*e*sin(2*d*x + 2*c) + 8*sqrt(2)*e)
*log(-2*sqrt(2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/
4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 2*(sqrt(2)*cos(1/4*arctan2
(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 1)*cos(1/2*arctan2(sin(2*d*x + 2*c)
, cos(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
^2 + 2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), c
os(2*d*x + 2*c))) + 1) + (8*I*sqrt(2)*e*cos(2*d*x + 2*c) - 8*sqrt(2)*e*sin(
2*d*x + 2*c) + 8*I*sqrt(2)*e)*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2
+ 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2*sqrt(2
)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) + (-8*I*sqrt(2)
*e*cos(2*d*x + 2*c) + 8*sqrt(2)*e*sin(2*d*x + 2*c) - 8*I*sqrt(2)*e)*log(2*c
os(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(s
in(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x
 + 2*c), cos(2*d*x + 2*c))) - 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), c
os(2*d*x + 2*c))) + 2) + (8*I*sqrt(2)*e*cos(2*d*x + 2*c) - 8*sqrt(2)*e*sin(
2*d*x + 2*c) + 8*I*sqrt(2)*e)*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2
- 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2*sqrt(2
)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) + (-8*I*sqrt(2)
*e*cos(2*d*x + 2*c) + 8*sqrt(2)*e*sin(2*d*x + 2*c) - 8*I*sqrt(2)*e)*log(2*c
os(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(s
in(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x
 + 2*c), cos(2*d*x + 2*c))) - 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), c
os(2*d*x + 2*c))) + 2) - 128*I*e*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*
x + 2*c))))*sqrt(a)*sqrt(e)/(d*(-64*I*cos(2*d*x + 2*c) + 64*sin(2*d*x + 2*c
) - 64*I))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(\frac{e}{\cos(c+d\,x)}\right)^{3/2}\,\sqrt{a+a\tan(c+d\,x)\,1\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] int((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(c+dx))^{\frac{3}{2}}\sqrt{ia(\tan(c+dx)-i)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(3/2)*(a+I*a*tan(d*x+c))**(1/2),x)
[Out] Integral((e*sec(c + d*x))**(3/2)*sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.395 $\int \sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=323

$$\frac{i\sqrt{2}\sqrt{a}\sqrt{e}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{d}-\frac{i\sqrt{2}\sqrt{a}\sqrt{e}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{d}-i\sqrt{a}\sqrt{e}\log\left(-\frac{\sqrt{2}\sqrt{a}}{}\right.$$

```
[Out] -1/2*I*ln(a-2^(1/2)*a^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))
^(1/2)+cos(d*x+c)*(a+I*a*tan(d*x+c)))*a^(1/2)*e^(1/2)/d*2^(1/2)+1/2*I*ln(a+
2^(1/2)*a^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2)+cos(d
*x+c)*(a+I*a*tan(d*x+c)))*a^(1/2)*e^(1/2)/d*2^(1/2)+I*arctan(1-2^(1/2)*e^(1
/2)*(a+I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*sec(d*x+c))^(1/2))*2^(1/2)*a^(1/2)*
e^(1/2)/d-I*arctan(1+2^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*se
c(d*x+c))^(1/2))*2^(1/2)*a^(1/2)*e^(1/2)/d
```

Rubi [A] time = 0.19, antiderivative size = 323, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.233, Rules used = {3495, 297, 1162, 617, 204, 1165, 628}

$$\frac{i\sqrt{2}\sqrt{a}\sqrt{e}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{d}-\frac{i\sqrt{2}\sqrt{a}\sqrt{e}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{d}-i\sqrt{a}\sqrt{e}\log\left(-\frac{\sqrt{2}\sqrt{a}}{}\right.$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Sec[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (I*Sqrt[2]*Sqrt[a]*Sqrt[e]*ArcTan[1 - (Sqrt[2]*Sqrt[e]*Sqrt[a + I*a*Tan[c +
 d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])]])/d - (I*Sqrt[2]*Sqrt[a]*Sqrt[e]*Arc
Tan[1 + (Sqrt[2]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]])/(Sqrt[a]*Sqrt[e*Sec[c
+ d*x]])]])/d - (I*Sqrt[a]*Sqrt[e]*Log[a - (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a +
 I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a + I*a*Tan[c + d*
x])])/(Sqrt[2]*d) + (I*Sqrt[a]*Sqrt[e]*Log[a + (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqr
t[a + I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a + I*a*Tan[c
 + d*x])])/(Sqrt[2]*d)
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3495

```
Int[Sqrt[(d_.)*sec[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[(-4*b*d^2)/f, Subst[Int[x^2/(a^2 + d^2*x^4), x],
 x, Sqrt[a + b*Tan[e + f*x]]/Sqrt[d*Sec[e + f*x]]], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}\,dx = -\frac{(4iae^2)\,\text{Subst}\left(\int \frac{x^2}{a^2+e^2x^4}\,dx, x, \frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\right)}{d}$$

$$= \frac{(2iae)\,\text{Subst}\left(\int \frac{a-ex^2}{a^2+e^2x^4}\,dx, x, \frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\right)}{d} - \frac{(2iae)\,\text{Subst}\left(\int \frac{a+ex^2}{a^2+e^2x^4}\right.}{d}$$

$$= -\frac{(ia)\,\text{Subst}\left(\int \frac{1}{\frac{a}{e}-\frac{\sqrt{2}\sqrt{a}x}{\sqrt{e}}+x^2}\,dx, x, \frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\right)}{d} - \frac{(ia)\,\text{Subst}\left(\int \frac{}{\frac{a}{e}+\frac{\sqrt{}}{}}\right.}{}$$

$$= -\frac{i\sqrt{a}\sqrt{e}\log\left(a-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}+\cos(c+dx)(a+ia\tan(c+\right.}{\sqrt{2}d}$$

$$= \frac{i\sqrt{2}\sqrt{a}\sqrt{e}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{d} - \frac{i\sqrt{2}\sqrt{a}\sqrt{e}\tan^{-1}\left(1+\right.}{d}$$

Mathematica [A] time = 1.66, size = 277, normalized size = 0.86

$$-\frac{2e\sqrt{\tan\left(\frac{dx}{2}\right)+i}\sqrt{a+ia\tan(c+dx)}\left(\sqrt{-\sin(c)-i\cos(c)-1}\sqrt{-\sin(c)+i\cos(c)+1}\tanh^{-1}\left(\frac{\sqrt{\sin(c)-i\cos(c)+1}}{\sqrt{-\sin(c)-i\cos(c)-1}}\right.\right.}{d\sqrt{i\sin(2c)+\cos(2c)+1}\sqrt{-\tan\left(\right.}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Sec[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (-2*e*(ArcTanh[(Sqrt[1 - I*Cos[c] + Sin[c]]*Sqrt[I - Tan[(d*x)/2]])/(Sqrt[-
1 - I*Cos[c] - Sin[c]]*Sqrt[I + Tan[(d*x)/2]])]*Sqrt[-1 - I*Cos[c] - Sin[c]
]*Sqrt[1 + I*Cos[c] - Sin[c]] - ArcTanh[(Sqrt[1 + I*Cos[c] - Sin[c]]*Sqrt[I
 - Tan[(d*x)/2]])/(Sqrt[-1 + I*Cos[c] + Sin[c]]*Sqrt[I + Tan[(d*x)/2]])]*Sq
rt[1 - I*Cos[c] + Sin[c]]*Sqrt[-1 + I*Cos[c] + Sin[c]])*Sqrt[I + Tan[(d*x)/
2]]*Sqrt[a + I*a*Tan[c + d*x]])/(d*Sqrt[e*Sec[c + d*x]]*Sqrt[1 + Cos[2*c] +
 I*Sin[2*c]]*Sqrt[I - Tan[(d*x)/2]])
```

fricas [A] time = 0.65, size = 323, normalized size = 1.00

$$\frac{1}{2}\sqrt{\frac{4i\,ae}{d^2}}\log\left(2\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(e^{(2i\,dx+2i\,c)}+1\right)e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+d\sqrt{\frac{4i\,ae}{d^2}}\right)-\frac{1}{2}\sqrt{\frac{4i\,ae}{d^2}}\log\left(2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="frica
s")
```

```
[Out] 1/2*sqrt(4*I*a*e/d^2)*log(2*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*
I*d*x + 2*I*c) + 1))*(e^(2*I*d*x + 2*I*c) + 1)*e^(1/2*I*d*x + 1/2*I*c) + d*
sqrt(4*I*a*e/d^2)) - 1/2*sqrt(4*I*a*e/d^2)*log(2*sqrt(a/(e^(2*I*d*x + 2*I*c
) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(e^(2*I*d*x + 2*I*c) + 1)*e^(1/2*
I*d*x + 1/2*I*c) - d*sqrt(4*I*a*e/d^2)) - 1/2*sqrt(-4*I*a*e/d^2)*log(2*sqrt
(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(e^(2*I*d*x
 + 2*I*c) + 1)*e^(1/2*I*d*x + 1/2*I*c) + d*sqrt(-4*I*a*e/d^2)) + 1/2*sqrt(-
4*I*a*e/d^2)*log(2*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2
*I*c) + 1))*(e^(2*I*d*x + 2*I*c) + 1)*e^(1/2*I*d*x + 1/2*I*c) - d*sqrt(-4*I
*a*e/d^2))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{e\sec\left(dx+c\right)}\sqrt{i\,a\tan\left(dx+c\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] integrate(sqrt(e*sec(d*x + c))*sqrt(I*a*tan(d*x + c) + a), x)
```

maple [A] time = 1.33, size = 230, normalized size = 0.71

$$-\frac{\sqrt{\frac{e}{\cos(dx+c)}}\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\cos\left(dx+c\right)\left(-1+\cos\left(dx+c\right)\right)\left(i\,\mathrm{arctanh}\left(\frac{\sqrt{\frac{1}{1+\cos(dx+c)}}\,(\cos(dx+c)+1+\sin(dx+c)}{2}\right.\right.}{d\sin\left(dx+c\right)(i}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] -1/d*(e/cos(d*x+c))^(1/2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*co
s(d*x+c)*(-1+cos(d*x+c))*(I*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c
)+1+sin(d*x+c)))-I*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d
*x+c)))-arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))-arc
tanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c))))/sin(d*x+c)/(I
*sin(d*x+c)+cos(d*x+c)-1)/(1/(1+cos(d*x+c)))^(1/2)
```

maxima [B] time = 0.84, size = 1400, normalized size = 4.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxim
a")
```

```
[Out] 1/4*(-2*I*sqrt(2)*arctan2(sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos
(3/2*d*x + 3/2*c))) + 1, sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(
3/2*d*x + 3/2*c))) + 1) - 2*I*sqrt(2)*arctan2(sqrt(2)*cos(1/3*arctan2(sin(3
/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1, -sqrt(2)*sin(1/3*arctan2(sin(3
/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) - 2*I*sqrt(2)*arctan2(sqrt(2)*
cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 1, sqrt(2)*s
in(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) - 2*I*sqrt
(2)*arctan2(sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2
*c))) - 1, -sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2
*c))) + 1) - 2*sqrt(2)*arctan2(sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c)
, cos(3/2*d*x + 3/2*c))) + sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*
x + 3/2*c))), sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3
/2*c))) + cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1)
 + 2*sqrt(2)*arctan2(-sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2
*d*x + 3/2*c))) + sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c
))), -sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))
+ cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) + I*sqr
t(2)*log(2*sqrt(2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*
c)))*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2*(sqrt
(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1)*cos(2
/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + cos(2/3*arctan2(s
in(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*cos(1/3*arctan2(sin(3/2*d
*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + sin(2/3*arctan2(sin(3/2*d*x + 3/2*c
), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3
/2*d*x + 3/2*c)))^2 + 2*sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3
/2*d*x + 3/2*c))) + 1) - I*sqrt(2)*log(-2*sqrt(2)*sin(2/3*arctan2(sin(3/2*d
*x + 3/2*c), cos(3/2*d*x + 3/2*c)))*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), c
os(3/2*d*x + 3/2*c))) - 2*(sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), co
s(3/2*d*x + 3/2*c))) - 1)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x
 + 3/2*c))) + cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^
2 + 2*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + sin(
2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arct
an2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 - 2*sqrt(2)*cos(1/3*arct
an2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) + sqrt(2)*log(2*cos(1
/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arcta
n2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sqrt(2)*cos(1/3*arcta
n2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2*sqrt(2)*sin(1/3*arctan2
(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2) - sqrt(2)*log(2*cos(1/3*
arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2(
sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sqrt(2)*cos(1/3*arctan2(
sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 2*sqrt(2)*sin(1/3*arctan2(si
n(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2) + sqrt(2)*log(2*cos(1/3*arc
tan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2(sin
(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 - 2*sqrt(2)*cos(1/3*arctan2(sin
(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2*sqrt(2)*sin(1/3*arctan2(sin(3
/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2) - sqrt(2)*log(2*cos(1/3*arctan
2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2(sin(3/
2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 - 2*sqrt(2)*cos(1/3*arctan2(sin(3/
2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 2*sqrt(2)*sin(1/3*arctan2(sin(3/2*
d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2))*sqrt(a)*sqrt(e)/d
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \sqrt{\frac{e}{\cos (c+d\,x)}}\,\sqrt{a+a\tan (c+d\,x)\,1\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^(1/2),x)
[Out] int((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{e\sec(c+dx)}\,\sqrt{ia(\tan(c+dx)-i)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(1/2)*(a+I*a*tan(d*x+c))**(1/2),x)
[Out] Integral(sqrt(e*sec(c + d*x))*sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.396 $\int \frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\,dx$

Optimal. Leaf size=36

$$-\frac{2i\sqrt{a+ia\tan(c+dx)}}{d\sqrt{e\sec(c+dx)}}$$

```
[Out] -2*I*(a+I*a*tan(d*x+c))^(1/2)/d/(e*sec(d*x+c))^(1/2)
```

Rubi [A] time = 0.06, antiderivative size = 36, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.033$, Rules used = {3488}

$$-\frac{2i\sqrt{a+ia\tan(c+dx)}}{d\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a + I*a*Tan[c + d*x]]/Sqrt[e*Sec[c + d*x]],x]
```

```
[Out] ((-2*I)*Sqrt[a + I*a*Tan[c + d*x]])/(d*Sqrt[e*Sec[c + d*x]])
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rubi steps

$$\int \frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\,dx = -\frac{2i\sqrt{a+ia\tan(c+dx)}}{d\sqrt{e\sec(c+dx)}}$$

Mathematica [A] time = 0.06, size = 36, normalized size = 1.00

$$-\frac{2i\sqrt{a+ia\tan(c+dx)}}{d\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a + I*a*Tan[c + d*x]]/Sqrt[e*Sec[c + d*x]],x]
```

```
[Out] ((-2*I)*Sqrt[a + I*a*Tan[c + d*x]])/(d*Sqrt[e*Sec[c + d*x]])
```

fricas [B] time = 1.62, size = 64, normalized size = 1.78

$$\frac{2\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(-i\,e^{(2i\,dx+2i\,c)}-i\right)e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}}{de}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2),x, algorithm="frica
s")
```

```
[Out] 2*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(-I*e
^(2*I*d*x + 2*I*c) - I)*e^(1/2*I*d*x + 1/2*I*c)/(d*e)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{i\, a \tan\left(dx+c\right)+a}}{\sqrt{e \sec\left(dx+c\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)/sqrt(e*sec(d*x + c)), x)
```

maple [A] time = 1.25, size = 56, normalized size = 1.56

$$-\frac{2 i \cos\left(dx+c\right) \sqrt{\frac{a\left(i \sin\left(dx+c\right)+\cos\left(dx+c\right)\right)}{\cos\left(dx+c\right)}}\, \sqrt{\frac{e}{\cos\left(dx+c\right)}}}{de}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2),x)
```

```
[Out] -2*I/d*cos(d*x+c)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(e/cos(d*x
+c))^(1/2)/e
```

maxima [B] time = 0.49, size = 76, normalized size = 2.11

$$-\frac{2 i \sqrt{a} \sqrt{-\frac{2 i \sin\left(dx+c\right)}{\cos\left(dx+c\right)+1}+\frac{\sin\left(dx+c\right)^{2}}{\left(\cos\left(dx+c\right)+1\right)^{2}}-1}}{d \sqrt{e} \sqrt{-\frac{\sin\left(dx+c\right)^{2}}{\left(\cos\left(dx+c\right)+1\right)^{2}}-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2),x, algorithm="maxim
a")
```

```
[Out] -2*I*sqrt(a)*sqrt(-2*I*sin(d*x + c)/(cos(d*x + c) + 1) + sin(d*x + c)^2/(co
s(d*x + c) + 1)^2 - 1)/(d*sqrt(e)*sqrt(-sin(d*x + c)^2/(cos(d*x + c) + 1)^2
 - 1))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\sqrt{a+a \tan\left(c+d\,x\right)\,1{}\mathrm{i}}}{\sqrt{\frac{e}{\cos\left(c+d\,x\right)}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(1/2)/(e/cos(c + d*x))^(1/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^(1/2)/(e/cos(c + d*x))^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{i a \left(\tan\left(c+dx\right)-i\right)}}{\sqrt{e \sec\left(c+dx\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**(1/2)/(e*sec(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(I*a*(tan(c + d*x) - I))/sqrt(e*sec(c + d*x)), x)
```

3.397 $\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\sec(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=81

$$\frac{4ia\sqrt{e\sec(c+dx)}}{3de^2\sqrt{a+ia\tan(c+dx)}}-\frac{2i\sqrt{a+ia\tan(c+dx)}}{3d(e\sec(c+dx))^{3/2}}$$

```
[Out] 4/3*I*a*(e*sec(d*x+c))^(1/2)/d/e^2/(a+I*a*tan(d*x+c))^(1/2)-2/3*I*(a+I*a*ta
n(d*x+c))^(1/2)/d/(e*sec(d*x+c))^(3/2)
```

Rubi [A] time = 0.13, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {3497, 3488}

$$\frac{4ia\sqrt{e\sec(c+dx)}}{3de^2\sqrt{a+ia\tan(c+dx)}}-\frac{2i\sqrt{a+ia\tan(c+dx)}}{3d(e\sec(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a + I*a*Tan[c + d*x]]/(e*Sec[c + d*x])^(3/2),x]
```

```
[Out] (((4*I)/3)*a*Sqrt[e*Sec[c + d*x]])/(d*e^2*Sqrt[a + I*a*Tan[c + d*x]]) - (((
2*I)/3)*Sqrt[a + I*a*Tan[c + d*x]])/(d*(e*Sec[c + d*x])^(3/2))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rubi steps

$$\begin{aligned}\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\sec(c+dx))^{3/2}}\,dx &= -\frac{2i\sqrt{a+ia\tan(c+dx)}}{3d(e\sec(c+dx))^{3/2}}+\frac{(2a)\int \frac{\sqrt{e\sec(c+dx)}}{\sqrt{a+ia\tan(c+dx)}}\,dx}{3e^2}\\ &= \frac{4ia\sqrt{e\sec(c+dx)}}{3de^2\sqrt{a+ia\tan(c+dx)}}-\frac{2i\sqrt{a+ia\tan(c+dx)}}{3d(e\sec(c+dx))^{3/2}}\end{aligned}$$

Mathematica [A] time = 0.19, size = 48, normalized size = 0.59

$$\frac{2(2\tan(c+dx)+i)\sqrt{a+ia\tan(c+dx)}}{3d(e\sec(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a + I*a*Tan[c + d*x]]/(e*Sec[c + d*x])^(3/2),x]
```

[Out] (2*(I + 2*Tan[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])/(3*d*(e*Sec[c + d*x])^(3/2))

fricas [A] time = 0.70, size = 75, normalized size = 0.93

$$\frac{\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(-i\,e^{(4i\,dx+4i\,c)}+2i\,e^{(2i\,dx+2i\,c)}+3i\right)e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{3\,de^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(3/2),x, algorithm="fricas")

[Out] 1/3*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(-I*e^(4*I*d*x + 4*I*c) + 2*I*e^(2*I*d*x + 2*I*c) + 3*I)*e^(-1/2*I*d*x - 1/2*I*c)/(d*e^2)

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{i\,a\tan\left(dx+c\right)+a}}{\left(e\sec\left(dx+c\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(3/2),x, algorithm="giac")

[Out] integrate(sqrt(I*a*tan(d*x + c) + a)/(e*sec(d*x + c))^(3/2), x)

maple [A] time = 1.30, size = 75, normalized size = 0.93

$$\frac{2\left(i\cos\left(dx+c\right)+2\sin\left(dx+c\right)\right)\left(\cos^2\left(dx+c\right)\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(\frac{e}{\cos(dx+c)}\right)^{\frac{3}{2}}}{3d\,e^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(3/2),x)

[Out] 2/3/d*(I*cos(d*x+c)+2*sin(d*x+c))*cos(d*x+c)^2*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(e/cos(d*x+c))^(3/2)/e^3

maxima [A] time = 0.92, size = 54, normalized size = 0.67

$$\frac{\sqrt{a}\left(-i\,\cos\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right)+3i\,\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+\sin\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right)+3\,\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)}{3\,de^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(3/2),x, algorithm="maxima")

[Out] 1/3*sqrt(a)*(-I*cos(3/2*d*x + 3/2*c) + 3*I*cos(1/2*d*x + 1/2*c) + sin(3/2*d*x + 3/2*c) + 3*sin(1/2*d*x + 1/2*c))/(d*e^(3/2))

mupad [B] time = 4.63, size = 86, normalized size = 1.06

$$\frac{\sqrt{\frac{e}{\cos(c+d\,x)}}\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}\,\left(\cos\left(2\,c+2\,d\,x\right)\,1\mathrm{i}+2\,\sin\left(2\,c+2\,d\,x\right)+1\mathrm{i}\right)}{3\,d\,e^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(1/2)/(e/cos(c + d*x))^(3/2),x)
```

```
[Out] ((e/cos(c + d*x))^(1/2)*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))/(
cos(2*c + 2*d*x) + 1))^(1/2)*(cos(2*c + 2*d*x)*1i + 2*sin(2*c + 2*d*x) + 1i
))/(3*d*e^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{ia\left(\tan\left(c+dx\right)-i\right)}}{\left(e\sec\left(c+dx\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**(1/2)/(e*sec(d*x+c))**(3/2),x)
```

```
[Out] Integral(sqrt(I*a*(tan(c + d*x) - I))/(e*sec(c + d*x))**(3/2), x)
```

3.398 $\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\sec(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=122

$$\frac{8ia}{15de^2\sqrt{a+ia\tan(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{16i\sqrt{a+ia\tan(c+dx)}}{15de^2\sqrt{e\sec(c+dx)}}-\frac{2i\sqrt{a+ia\tan(c+dx)}}{5d(e\sec(c+dx))^{5/2}}$$

```
[Out] 8/15*I*a/d/e^2/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)-2/5*I*(a+I*a*t
an(d*x+c))^(1/2)/d/(e*sec(d*x+c))^(5/2)-16/15*I*(a+I*a*tan(d*x+c))^(1/2)/d/
e^2/(e*sec(d*x+c))^(1/2)
```

Rubi [A] time = 0.20, antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {3497, 3502, 3488}

$$\frac{8ia}{15de^2\sqrt{a+ia\tan(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{16i\sqrt{a+ia\tan(c+dx)}}{15de^2\sqrt{e\sec(c+dx)}}-\frac{2i\sqrt{a+ia\tan(c+dx)}}{5d(e\sec(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a + I*a*Tan[c + d*x]]/(e*Sec[c + d*x])^(5/2),x]
```

```
[Out] (((8*I)/15)*a)/(d*e^2*Sqrt[e*Sec[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) - ((
(2*I)/5)*Sqrt[a + I*a*Tan[c + d*x]])/(d*(e*Sec[c + d*x])^(5/2)) - (((16*I)/
15)*Sqrt[a + I*a*Tan[c + d*x]])/(d*e^2*Sqrt[e*Sec[c + d*x]])
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\sec(c+dx))^{5/2}}\,dx = -\frac{2i\sqrt{a+ia\tan(c+dx)}}{5d(e\sec(c+dx))^{5/2}} + \frac{(4a)\int \frac{1}{\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}}\,dx}{5e^2}$$

$$= \frac{8ia}{15de^2\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}} - \frac{2i\sqrt{a+ia\tan(c+dx)}}{5d(e\sec(c+dx))^{5/2}} + \frac{8\int \frac{\sqrt{a+ia\tan(c+}}{\sqrt{e\sec(c+d}}}{15e^2}$$

$$= \frac{8ia}{15de^2\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}} - \frac{2i\sqrt{a+ia\tan(c+dx)}}{5d(e\sec(c+dx))^{5/2}} - \frac{16i\sqrt{a+ia\tan}}{15de^2\sqrt{e\sec(}}$$

Mathematica [A] time = 0.22, size = 63, normalized size = 0.52

$$\frac{i\sqrt{a+ia\tan(c+dx)}\,(-4i\sin(2(c+dx))+\cos(2(c+dx))-15)}{15de^2\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a + I*a*Tan[c + d*x]]/(e*Sec[c + d*x])^(5/2),x]
```

```
[Out] ((I/15)*(-15 + Cos[2*(c + d*x)] - (4*I)*Sin[2*(c + d*x)])*Sqrt[a + I*a*Tan[
c + d*x]])/(d*e^2*Sqrt[e*Sec[c + d*x]])
```

fricas [A] time = 0.73, size = 86, normalized size = 0.70

$$\frac{\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}\left(-3ie^{(6idx+6ic)}-33ie^{(4idx+4ic)}-25ie^{(2idx+2ic)}+5i\right)e^{\left(-\frac{3}{2}idx-\frac{3}{2}ic\right)}}{30\,de^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(5/2),x, algorithm="frica
s")
```

```
[Out] 1/30*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(-
3*I*e^(6*I*d*x + 6*I*c) - 33*I*e^(4*I*d*x + 4*I*c) - 25*I*e^(2*I*d*x + 2*I*
c) + 5*I)*e^(-3/2*I*d*x - 3/2*I*c)/(d*e^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{i\,a\tan(dx+c)+a}}{(e\sec(dx+c))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(5/2),x, algorithm="giac"
)
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)/(e*sec(d*x + c))^(5/2), x)
```

maple [A] time = 1.30, size = 85, normalized size = 0.70

$$\frac{2\left(i\left(\cos^2(dx+c)\right)+4\cos(dx+c)\sin(dx+c)-8i\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(\frac{e}{\cos(dx+c)}\right)^{\frac{5}{2}}\left(\cos^3(dx+c)\right)}{15d\,e^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(5/2),x)
```

```
[Out] 2/15/d*(I*cos(d*x+c)^2+4*cos(d*x+c)*sin(d*x+c)-8*I)*(a*(I*sin(d*x+c)+cos(d*
x+c))/cos(d*x+c))^(1/2)*(e/cos(d*x+c))^(5/2)*cos(d*x+c)^3/e^5
```

maxima [A] time = 0.72, size = 130, normalized size = 1.07

$$\frac{\sqrt{a}\left(5i\cos\left(\frac{3}{2}dx+\frac{3}{2}c\right)-3i\cos\left(\frac{5}{3}\arctan\left(\sin\left(\frac{3}{2}dx+\frac{3}{2}c\right),\cos\left(\frac{3}{2}dx+\frac{3}{2}c\right)\right)\right)-30i\cos\left(\frac{1}{3}\arctan\left(\sin\left(\frac{3}{2}d\right.\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(5/2),x, algorithm="maxim
a")
```

```
[Out] 1/30*sqrt(a)*(5*I*cos(3/2*d*x + 3/2*c) - 3*I*cos(5/3*arctan2(sin(3/2*d*x +
3/2*c), cos(3/2*d*x + 3/2*c))) - 30*I*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c),
 cos(3/2*d*x + 3/2*c))) + 5*sin(3/2*d*x + 3/2*c) + 3*sin(5/3*arctan2(sin(3/
2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 30*sin(1/3*arctan2(sin(3/2*d*x + 3
/2*c), cos(3/2*d*x + 3/2*c))))/(d*e^(5/2))
```

mupad [B] time = 4.68, size = 101, normalized size = 0.83

$$\frac{\sqrt{\frac{e}{\cos(c+d\,x)}}\,\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}\,\left(4\,\sin\left(c+d\,x\right)+4\,\sin\left(3\,c+3\,d\,x\right)-\cos\left(c+d\,x\right)\,29\mathrm{i}+\cos\left(3\,c+\right.\right.}{30\,d\,e^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(1/2)/(e/cos(c + d*x))^(5/2),x)
```

```
[Out] ((e/cos(c + d*x))^(1/2)*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))/(
cos(2*c + 2*d*x) + 1))^(1/2)*(4*sin(c + d*x) - cos(c + d*x)*29i + cos(3*c +
 3*d*x)*1i + 4*sin(3*c + 3*d*x)))/(30*d*e^3)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{ia\left(\tan\left(c+dx\right)-i\right)}}{\left(e\sec\left(c+dx\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**(1/2)/(e*sec(d*x+c))**(5/2),x)
```

```
[Out] Integral(sqrt(I*a*(tan(c + d*x) - I))/(e*sec(c + d*x))**(5/2), x)
```

3.399 $\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\sec(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=164

$$\frac{32ia\sqrt{e\sec(c+dx)}}{35de^4\sqrt{a+ia\tan(c+dx)}}+\frac{12ia}{35de^2\sqrt{a+ia\tan(c+dx)}\,(e\sec(c+dx))^{3/2}}-\frac{16i\sqrt{a+ia\tan(c+dx)}}{35de^2(e\sec(c+dx))^{3/2}}-\frac{2i\sqrt{a+ia\tan(c}}{7d(e\sec(c+d}$$

```
[Out] 12/35*I*a/d/e^2/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2)+32/35*I*a*(e*
sec(d*x+c))^(1/2)/d/e^4/(a+I*a*tan(d*x+c))^(1/2)-2/7*I*(a+I*a*tan(d*x+c))^(
1/2)/d/(e*sec(d*x+c))^(7/2)-16/35*I*(a+I*a*tan(d*x+c))^(1/2)/d/e^2/(e*sec(d
*x+c))^(3/2)
```

Rubi [A] time = 0.28, antiderivative size = 164, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {3497, 3502, 3488}

$$\frac{32ia\sqrt{e\sec(c+dx)}}{35de^4\sqrt{a+ia\tan(c+dx)}}+\frac{12ia}{35de^2\sqrt{a+ia\tan(c+dx)}\,(e\sec(c+dx))^{3/2}}-\frac{16i\sqrt{a+ia\tan(c+dx)}}{35de^2(e\sec(c+dx))^{3/2}}-\frac{2i\sqrt{a+ia\tan(c}}{7d(e\sec(c+d}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a + I*a*Tan[c + d*x]]/(e*Sec[c + d*x])^(7/2),x]
```

```
[Out] (((12*I)/35)*a)/(d*e^2*(e*Sec[c + d*x])^(3/2)*Sqrt[a + I*a*Tan[c + d*x]]) +
 (((32*I)/35)*a*Sqrt[e*Sec[c + d*x]])/(d*e^4*Sqrt[a + I*a*Tan[c + d*x]]) -
(((2*I)/7)*Sqrt[a + I*a*Tan[c + d*x]])/(d*(e*Sec[c + d*x])^(7/2)) - (((16*I
)/35)*Sqrt[a + I*a*Tan[c + d*x]])/(d*e^2*(e*Sec[c + d*x])^(3/2))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\sec(c+dx))^{7/2}}\,dx = -\frac{2i\sqrt{a+ia\tan(c+dx)}}{7d(e\sec(c+dx))^{7/2}} + \frac{(6a)\int \frac{1}{(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}}\,dx}{7e^2}$$

$$= \frac{12ia}{35de^2(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}} - \frac{2i\sqrt{a+ia\tan(c+dx)}}{7d(e\sec(c+dx))^{7/2}} + \frac{24\int \frac{\sqrt{a+i}}{(e\,se}}{3}$$

$$= \frac{12ia}{35de^2(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}} - \frac{2i\sqrt{a+ia\tan(c+dx)}}{7d(e\sec(c+dx))^{7/2}} - \frac{16i\sqrt{a+i}}{35de^2(e\,s}$$

$$= \frac{12ia}{35de^2(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}} + \frac{32ia\sqrt{e\sec(c+dx)}}{35de^4\sqrt{a+ia\tan(c+dx)}} - \frac{2i\sqrt{a}}{7d(e}$$

Mathematica [A] time = 0.27, size = 80, normalized size = 0.49

$$\frac{\sqrt{a+ia\tan(c+dx)}\,(70\sin(c+dx)+6\sin(3(c+dx))+35i\cos(c+dx)+i\cos(3(c+dx)))}{70de^3\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a + I*a*Tan[c + d*x]]/(e*Sec[c + d*x])^(7/2),x]
```

```
[Out] (((35*I)*Cos[c + d*x] + I*Cos[3*(c + d*x)] + 70*Sin[c + d*x] + 6*Sin[3*(c +
 d*x)])*Sqrt[a + I*a*Tan[c + d*x]])/(70*d*e^3*Sqrt[e*Sec[c + d*x]])
```

fricas [A] time = 0.64, size = 97, normalized size = 0.59

$$\frac{\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(-5i\,e^{(8i\,dx+8i\,c)}-40i\,e^{(6i\,dx+6i\,c)}+70i\,e^{(4i\,dx+4i\,c)}+112i\,e^{(2i\,dx+2i\,c)}+7i\right)e^{\left(-\frac{5}{2}i\,dx-\frac{5}{2}i\,c\right)}}{140\,de^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(7/2),x, algorithm="frica
s")
```

```
[Out] 1/140*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(
-5*I*e^(8*I*d*x + 8*I*c) - 40*I*e^(6*I*d*x + 6*I*c) + 70*I*e^(4*I*d*x + 4*I
*c) + 112*I*e^(2*I*d*x + 2*I*c) + 7*I)*e^(-5/2*I*d*x - 5/2*I*c)/(d*e^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{i\,a\tan(dx+c)+a}}{(e\sec(dx+c))^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(7/2),x, algorithm="giac"
)
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)/(e*sec(d*x + c))^(7/2), x)
```

maple [A] time = 1.37, size = 102, normalized size = 0.62

$$\frac{2\left(i\left(\cos^3(dx+c)\right)+6\left(\cos^2(dx+c)\right)\sin(dx+c)+8i\cos(dx+c)+16\sin(dx+c)\right)\left(\cos^4(dx+c)\right)\sqrt{\frac{a(i\sin(d}{}}}{35d\,e^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(7/2),x)
```

```
[Out] 2/35/d*(I*cos(d*x+c)^3+6*cos(d*x+c)^2*sin(d*x+c)+8*I*cos(d*x+c)+16*sin(d*x+
c))*cos(d*x+c)^4*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(e/cos(d*x+
c))^(7/2)/e^7
```

maxima [A] time = 0.88, size = 178, normalized size = 1.09

$$\frac{\sqrt{a}\left(7i\cos\left(\frac{5}{2}dx+\frac{5}{2}c\right)-5i\cos\left(\frac{7}{5}\arctan\left(\sin\left(\frac{5}{2}dx+\frac{5}{2}c\right),\cos\left(\frac{5}{2}dx+\frac{5}{2}c\right)\right)\right)-35i\cos\left(\frac{3}{5}\arctan\left(\sin\left(\frac{5}{2}dx+\right.\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(7/2),x, algorithm="maxim
a")
```

```
[Out] 1/140*sqrt(a)*(7*I*cos(5/2*d*x + 5/2*c) - 5*I*cos(7/5*arctan2(sin(5/2*d*x +
 5/2*c), cos(5/2*d*x + 5/2*c))) - 35*I*cos(3/5*arctan2(sin(5/2*d*x + 5/2*c)
, cos(5/2*d*x + 5/2*c))) + 105*I*cos(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(
5/2*d*x + 5/2*c))) + 7*sin(5/2*d*x + 5/2*c) + 5*sin(7/5*arctan2(sin(5/2*d*x
 + 5/2*c), cos(5/2*d*x + 5/2*c))) + 35*sin(3/5*arctan2(sin(5/2*d*x + 5/2*c)
, cos(5/2*d*x + 5/2*c))) + 105*sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/
2*d*x + 5/2*c))))/(d*e^(7/2))
```

mupad [B] time = 5.16, size = 109, normalized size = 0.66

$$\frac{\sqrt{\frac{e}{\cos(c+d\,x)}}\,\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}\,\left(\cos\left(2\,c+2\,d\,x\right)\,36\mathrm{i}+\cos\left(4\,c+4\,d\,x\right)\,1\mathrm{i}+76\,\sin\left(2\,c+2\,d\,x\right)+6\,\mathrm{s}\right.}{140\,d\,e^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(1/2)/(e/cos(c + d*x))^(7/2),x)
```

```
[Out] ((e/cos(c + d*x))^(1/2)*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))/(
cos(2*c + 2*d*x) + 1))^(1/2)*(cos(2*c + 2*d*x)*36i + cos(4*c + 4*d*x)*1i +
76*sin(2*c + 2*d*x) + 6*sin(4*c + 4*d*x) + 35i))/(140*d*e^4)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**(1/2)/(e*sec(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.400 $\int (e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))^{3/2}\,dx$

Optimal. Leaf size=453

$$\frac{7ia^{3/2}e^{5/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{8\sqrt{2}d}-\frac{7ia^{3/2}e^{5/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{8\sqrt{2}d}-\frac{7ia^{3/2}e^{5/2}\log\left(-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{}}{\sqrt{e\sec}}\right.}{}$$

```
[Out] 7/16*I*a^(3/2)*e^(5/2)*arctan(1-2^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/a^
(1/2)/(e*sec(d*x+c))^(1/2))/d*2^(1/2)-7/16*I*a^(3/2)*e^(5/2)*arctan(1+2^(1/
2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*sec(d*x+c))^(1/2))/d*2^(1/2)
-7/32*I*a^(3/2)*e^(5/2)*ln(a-2^(1/2)*a^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/
2)/(e*sec(d*x+c))^(1/2)+cos(d*x+c)*(a+I*a*tan(d*x+c)))/d*2^(1/2)+7/32*I*a^(
3/2)*e^(5/2)*ln(a+2^(1/2)*a^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/(e*sec(d
*x+c))^(1/2)+cos(d*x+c)*(a+I*a*tan(d*x+c)))/d*2^(1/2)+7/12*I*a^2*(e*sec(d*x
+c))^(5/2)/d/(a+I*a*tan(d*x+c))^(1/2)+1/3*I*a*(e*sec(d*x+c))^(5/2)*(a+I*a*t
an(d*x+c))^(1/2)/d-7/8*I*a*e^2*(e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^(1/2
)/d
```

Rubi [A] time = 0.51, antiderivative size = 453, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 9, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {3498, 3501, 3495, 297, 1162, 617, 204, 1165, 628}

$$\frac{7ia^{3/2}e^{5/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{8\sqrt{2}d}-\frac{7ia^{3/2}e^{5/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{8\sqrt{2}d}-\frac{7ia^{3/2}e^{5/2}\log\left(-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{}}{\sqrt{e\sec}}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(5/2)*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((7*I)/8)*a^(3/2)*e^(5/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e]*Sqrt[a + I*a*Tan[c +
 d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])])/(Sqrt[2]*d) - (((7*I)/8)*a^(3/2)*e
^(5/2)*ArcTan[1 + (Sqrt[2]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]])/(Sqrt[a]*Sqr
t[e*Sec[c + d*x]])])/(Sqrt[2]*d) - (((7*I)/16)*a^(3/2)*e^(5/2)*Log[a - (Sqr
t[2]*Sqrt[a]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos
[c + d*x]*(a + I*a*Tan[c + d*x])])/(Sqrt[2]*d) + (((7*I)/16)*a^(3/2)*e^(5/2
)*Log[a + (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]])/Sqrt[e*Sec[c
 + d*x]] + Cos[c + d*x]*(a + I*a*Tan[c + d*x])])/(Sqrt[2]*d) + (((7*I)/12)*
a^2*(e*Sec[c + d*x])^(5/2))/(d*Sqrt[a + I*a*Tan[c + d*x]]) - (((7*I)/8)*a*e
^2*Sqrt[e*Sec[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]])/d + ((I/3)*a*(e*Sec[c +
 d*x])^(5/2)*Sqrt[a + I*a*Tan[c + d*x]])/d
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
```

```
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3495

```
Int[Sqrt[(d_.)*sec[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[(-4*b*d^2)/f, Subst[Int[x^2/(a^2 + d^2*x^4), x],
 x, Sqrt[a + b*Tan[e + f*x]]/Sqrt[d*Sec[e + f*x]]], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3498

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m}, x] && EqQ[a^2 + b^2, 0] && GtQ[n, 0] && NeQ[m + n - 1, 0] && IntegersQ[
2*m, 2*n]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rubi steps

$$\int (e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))^{3/2}\,dx = \frac{ia(e\sec(c+dx))^{5/2}\sqrt{a+ia\tan(c+dx)}}{3d}+\frac{1}{6}(7a)\int (e\sec(c+dx$$

$$= \frac{7ia^2(e\sec(c+dx))^{5/2}}{12d\sqrt{a+ia\tan(c+dx)}}+\frac{ia(e\sec(c+dx))^{5/2}\sqrt{a+ia\tan(c+d}}{3d}$$

$$= \frac{7ia^2(e\sec(c+dx))^{5/2}}{12d\sqrt{a+ia\tan(c+dx)}}-\frac{7iae^2\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+}}{8d}$$

$$= \frac{7ia^2(e\sec(c+dx))^{5/2}}{12d\sqrt{a+ia\tan(c+dx)}}-\frac{7iae^2\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+}}{8d}$$

$$= \frac{7ia^2(e\sec(c+dx))^{5/2}}{12d\sqrt{a+ia\tan(c+dx)}}-\frac{7iae^2\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+}}{8d}$$

$$= \frac{7ia^2(e\sec(c+dx))^{5/2}}{12d\sqrt{a+ia\tan(c+dx)}}-\frac{7iae^2\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+}}{8d}$$

$$= -\frac{7ia^{3/2}e^{5/2}\log\left(a-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}+\cos(c+dx)(a+ia\right.}{16\sqrt{2}\,d}$$

$$= \frac{7ia^{3/2}e^{5/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{8\sqrt{2}\,d}-\frac{7ia^{3/2}e^{5/2}\tan^{-1}\left(1+\right.}{8}$$

Mathematica [A] time = 4.15, size = 376, normalized size = 0.83

$$-\frac{a\sqrt{a+ia\tan(c+dx)}\,(e\sec(c+dx))^{5/2}\left(2i\sqrt{i\sin(2c)+\cos(2c)+1}\sqrt{-\tan\left(\frac{dx}{2}\right)+i}\,(14i\sin(2c+2dx)+7\cos\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(5/2)*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] -1/96*(a*(e*Sec[c + d*x])^(5/2)*((2*I)*Sqrt[1 + Cos[2*c] + I*Sin[2*c]]*(-9
+ 7*Cos[2*c + 2*d*x] + (14*I)*Sin[2*c + 2*d*x])*Sqrt[I - Tan[(d*x)/2]] + 84
*ArcTanh[(Sqrt[1 - I*Cos[c] + Sin[c]]*Sqrt[I - Tan[(d*x)/2]])/(Sqrt[-1 - I*
Cos[c] - Sin[c]]*Sqrt[I + Tan[(d*x)/2]])]*Cos[c + d*x]^3*Sqrt[-1 - I*Cos[c]
 - Sin[c]]*Sqrt[1 + I*Cos[c] - Sin[c]]*Sqrt[I + Tan[(d*x)/2]] - 84*ArcTanh[
(Sqrt[1 + I*Cos[c] - Sin[c]]*Sqrt[I - Tan[(d*x)/2]])/(Sqrt[-1 + I*Cos[c] +
Sin[c]]*Sqrt[I + Tan[(d*x)/2]])]*Cos[c + d*x]^3*Sqrt[1 - I*Cos[c] + Sin[c]]
*Sqrt[-1 + I*Cos[c] + Sin[c]]*Sqrt[I + Tan[(d*x)/2]])*Sqrt[a + I*a*Tan[c +
d*x]])/(d*Sqrt[1 + Cos[2*c] + I*Sin[2*c]]*Sqrt[I - Tan[(d*x)/2]])
```

fricas [A] time = 0.67, size = 644, normalized size = 1.42

$$\frac{\left(-21i\,ae^2e^{(5i\,dx+5i\,c)}+18i\,ae^2e^{(3i\,dx+3i\,c)}+7i\,ae^2e^{(i\,dx+i\,c)}\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+6\sqrt{\frac{49i\,a^3e^5}{64\,d^2}}\left(de^{(4i\right.}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="frica
s")
```

```
[Out] 1/12*((-21*I*a*e^2*e^(5*I*d*x + 5*I*c) + 18*I*a*e^2*e^(3*I*d*x + 3*I*c) + 7
*I*a*e^2*e^(I*d*x + I*c))*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*
d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 6*sqrt(49/64*I*a^3*e^5/d^2)*(d
*e^(4*I*d*x + 4*I*c) + 2*d*e^(2*I*d*x + 2*I*c) + d)*log(2/7*(7*(a*e^2*e^(2*
I*d*x + 2*I*c) + a*e^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*
x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 8*sqrt(49/64*I*a^3*e^5/d^2)*d)/(
a*e^2)) - 6*sqrt(49/64*I*a^3*e^5/d^2)*(d*e^(4*I*d*x + 4*I*c) + 2*d*e^(2*I*d
*x + 2*I*c) + d)*log(2/7*(7*(a*e^2*e^(2*I*d*x + 2*I*c) + a*e^2)*sqrt(a/(e^(
2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2
*I*c) - 8*sqrt(49/64*I*a^3*e^5/d^2)*d)/(a*e^2)) - 6*sqrt(-49/64*I*a^3*e^5/d
^2)*(d*e^(4*I*d*x + 4*I*c) + 2*d*e^(2*I*d*x + 2*I*c) + d)*log(2/7*(7*(a*e^2
*e^(2*I*d*x + 2*I*c) + a*e^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(
2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 8*sqrt(-49/64*I*a^3*e^5/d^
2)*d)/(a*e^2)) + 6*sqrt(-49/64*I*a^3*e^5/d^2)*(d*e^(4*I*d*x + 4*I*c) + 2*d*
e^(2*I*d*x + 2*I*c) + d)*log(2/7*(7*(a*e^2*e^(2*I*d*x + 2*I*c) + a*e^2)*sqr
t(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d
*x + 1/2*I*c) - 8*sqrt(-49/64*I*a^3*e^5/d^2)*d)/(a*e^2)))/(d*e^(4*I*d*x + 4
*I*c) + 2*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(e\sec\left(dx+c\right)\right)^{\frac{5}{2}} \left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac"
)
```

```
[Out] integrate((e*sec(d*x + c))^(5/2)*(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [A] time = 1.26, size = 414, normalized size = 0.91

$$-\left(\frac{e}{\cos(dx+c)}\right)^{\frac{5}{2}} \sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\,\left(-1+\cos\left(dx+c\right)\right)^{3} \left(21i\left(\cos^{3}\left(dx+c\right)\right)\operatorname{arctanh}\left(\frac{\sqrt{\frac{1}{1+\cos(dx+c)}}\,(\cos(dx+c)+1+\sin(\cdots}{2}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(5/2)*(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] -1/48/d*(e/cos(d*x+c))^(5/2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)
*(-1+cos(d*x+c))^3*(21*I*cos(d*x+c)^3*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*
(cos(d*x+c)+1+sin(d*x+c)))-21*I*cos(d*x+c)^3*arctanh(1/2*(1/(1+cos(d*x+c)))
^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))+42*I*cos(d*x+c)^2*sin(d*x+c)*(1/(1+cos(d*
x+c)))^(1/2)+28*I*cos(d*x+c)*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)+42*cos(d*x
+c)^3*(1/(1+cos(d*x+c)))^(1/2)-21*cos(d*x+c)^3*arctanh(1/2*(1/(1+cos(d*x+c)
))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))-21*cos(d*x+c)^3*arctanh(1/2*(1/(1+cos(d
*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))-16*I*sin(d*x+c)*(1/(1+cos(d*x+c)))
^(1/2)+14*cos(d*x+c)^2*(1/(1+cos(d*x+c)))^(1/2)-44*cos(d*x+c)*(1/(1+cos(d*x
+c)))^(1/2)-16*(1/(1+cos(d*x+c)))^(1/2))/sin(d*x+c)^5/(I*sin(d*x+c)+cos(d*x
+c)-1)/(1/(1+cos(d*x+c)))^(5/2)*a
```

maxima [B] time = 1.42, size = 3015, normalized size = 6.66

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxim
a")
```

```
[Out] -(64512*a*e^2*cos(11/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 55296
*a*e^2*cos(7/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 21504*a*e^2*c
os(3/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 64512*I*a*e^2*sin(11/
4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 55296*I*a*e^2*sin(7/4*arct
an2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 21504*I*a*e^2*sin(3/4*arctan2(si
n(2*d*x + 2*c), cos(2*d*x + 2*c))) + (8064*sqrt(2)*a*e^2*cos(6*d*x + 6*c) +
 24192*sqrt(2)*a*e^2*cos(4*d*x + 4*c) + 24192*sqrt(2)*a*e^2*cos(2*d*x + 2*c
) + 8064*I*sqrt(2)*a*e^2*sin(6*d*x + 6*c) + 24192*I*sqrt(2)*a*e^2*sin(4*d*x
 + 4*c) + 24192*I*sqrt(2)*a*e^2*sin(2*d*x + 2*c) + 8064*sqrt(2)*a*e^2)*arct
an2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1, sqrt(
2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (8064*sqrt(2
)*a*e^2*cos(6*d*x + 6*c) + 24192*sqrt(2)*a*e^2*cos(4*d*x + 4*c) + 24192*sqr
t(2)*a*e^2*cos(2*d*x + 2*c) + 8064*I*sqrt(2)*a*e^2*sin(6*d*x + 6*c) + 24192
*I*sqrt(2)*a*e^2*sin(4*d*x + 4*c) + 24192*I*sqrt(2)*a*e^2*sin(2*d*x + 2*c)
+ 8064*sqrt(2)*a*e^2)*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c))) + 1, -sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
 2*c))) + 1) + (8064*sqrt(2)*a*e^2*cos(6*d*x + 6*c) + 24192*sqrt(2)*a*e^2*c
os(4*d*x + 4*c) + 24192*sqrt(2)*a*e^2*cos(2*d*x + 2*c) + 8064*I*sqrt(2)*a*e
^2*sin(6*d*x + 6*c) + 24192*I*sqrt(2)*a*e^2*sin(4*d*x + 4*c) + 24192*I*sqrt
(2)*a*e^2*sin(2*d*x + 2*c) + 8064*sqrt(2)*a*e^2)*arctan2(sqrt(2)*cos(1/4*ar
ctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 1, sqrt(2)*sin(1/4*arctan2(sin
(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (8064*sqrt(2)*a*e^2*cos(6*d*x + 6*
c) + 24192*sqrt(2)*a*e^2*cos(4*d*x + 4*c) + 24192*sqrt(2)*a*e^2*cos(2*d*x +
 2*c) + 8064*I*sqrt(2)*a*e^2*sin(6*d*x + 6*c) + 24192*I*sqrt(2)*a*e^2*sin(4
*d*x + 4*c) + 24192*I*sqrt(2)*a*e^2*sin(2*d*x + 2*c) + 8064*sqrt(2)*a*e^2)*
arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 1, -
sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (8064*I
*sqrt(2)*a*e^2*cos(6*d*x + 6*c) + 24192*I*sqrt(2)*a*e^2*cos(4*d*x + 4*c) +
24192*I*sqrt(2)*a*e^2*cos(2*d*x + 2*c) - 8064*sqrt(2)*a*e^2*sin(6*d*x + 6*c
) - 24192*sqrt(2)*a*e^2*sin(4*d*x + 4*c) - 24192*sqrt(2)*a*e^2*sin(2*d*x +
2*c) + 8064*I*sqrt(2)*a*e^2)*arctan2(sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*
c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
)), sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*
arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (-8064*I*sqrt(2)*a*e^2*
cos(6*d*x + 6*c) - 24192*I*sqrt(2)*a*e^2*cos(4*d*x + 4*c) - 24192*I*sqrt(2)
*a*e^2*cos(2*d*x + 2*c) + 8064*sqrt(2)*a*e^2*sin(6*d*x + 6*c) + 24192*sqrt(
2)*a*e^2*sin(4*d*x + 4*c) + 24192*sqrt(2)*a*e^2*sin(2*d*x + 2*c) - 8064*I*s
qrt(2)*a*e^2)*arctan2(-sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))), -sqrt(2)*c
os(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (4032*sqrt(2)*a*e^2*cos(6*d*x + 6*c)
 + 12096*sqrt(2)*a*e^2*cos(4*d*x + 4*c) + 12096*sqrt(2)*a*e^2*cos(2*d*x + 2
*c) + 4032*I*sqrt(2)*a*e^2*sin(6*d*x + 6*c) + 12096*I*sqrt(2)*a*e^2*sin(4*d
*x + 4*c) + 12096*I*sqrt(2)*a*e^2*sin(2*d*x + 2*c) + 4032*sqrt(2)*a*e^2)*lo
g(2*sqrt(2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/4*ar
ctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2*(sqrt(2)*cos(1/4*arctan2(sin
(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 +
 2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2
(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c
), cos(2*d*x + 2*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c))) + 1) + (4032*sqrt(2)*a*e^2*cos(6*d*x + 6*c) + 12096*sqrt(2)*a
*e^2*cos(4*d*x + 4*c) + 12096*sqrt(2)*a*e^2*cos(2*d*x + 2*c) + 4032*I*sqrt(
2)*a*e^2*sin(6*d*x + 6*c) + 12096*I*sqrt(2)*a*e^2*sin(4*d*x + 4*c) + 12096*
I*sqrt(2)*a*e^2*sin(2*d*x + 2*c) + 4032*sqrt(2)*a*e^2)*log(-2*sqrt(2)*sin(1
```

```
/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/4*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c))) - 2*(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c))) - 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
+ cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*cos(1/4*arctan
2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c)
, cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*
c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1
) - (-4032*I*sqrt(2)*a*e^2*cos(6*d*x + 6*c) - 12096*I*sqrt(2)*a*e^2*cos(4*d
*x + 4*c) - 12096*I*sqrt(2)*a*e^2*cos(2*d*x + 2*c) + 4032*sqrt(2)*a*e^2*sin
(6*d*x + 6*c) + 12096*sqrt(2)*a*e^2*sin(4*d*x + 4*c) + 12096*sqrt(2)*a*e^2*
sin(2*d*x + 2*c) - 4032*I*sqrt(2)*a*e^2)*log(2*cos(1/4*arctan2(sin(2*d*x +
2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
 + 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) - (4
032*I*sqrt(2)*a*e^2*cos(6*d*x + 6*c) + 12096*I*sqrt(2)*a*e^2*cos(4*d*x + 4*
c) + 12096*I*sqrt(2)*a*e^2*cos(2*d*x + 2*c) - 4032*sqrt(2)*a*e^2*sin(6*d*x
+ 6*c) - 12096*sqrt(2)*a*e^2*sin(4*d*x + 4*c) - 12096*sqrt(2)*a*e^2*sin(2*d
*x + 2*c) + 4032*I*sqrt(2)*a*e^2)*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), c
os(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))
)^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 2*sq
rt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) - (-4032*I*
sqrt(2)*a*e^2*cos(6*d*x + 6*c) - 12096*I*sqrt(2)*a*e^2*cos(4*d*x + 4*c) - 1
2096*I*sqrt(2)*a*e^2*cos(2*d*x + 2*c) + 4032*sqrt(2)*a*e^2*sin(6*d*x + 6*c)
 + 12096*sqrt(2)*a*e^2*sin(4*d*x + 4*c) + 12096*sqrt(2)*a*e^2*sin(2*d*x + 2
*c) - 4032*I*sqrt(2)*a*e^2)*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 -
2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2*sqrt(2)*
sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) - (4032*I*sqrt(2)
*a*e^2*cos(6*d*x + 6*c) + 12096*I*sqrt(2)*a*e^2*cos(4*d*x + 4*c) + 12096*I*
sqrt(2)*a*e^2*cos(2*d*x + 2*c) - 4032*sqrt(2)*a*e^2*sin(6*d*x + 6*c) - 1209
6*sqrt(2)*a*e^2*sin(4*d*x + 4*c) - 12096*sqrt(2)*a*e^2*sin(2*d*x + 2*c) + 4
032*I*sqrt(2)*a*e^2)*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*
c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sqrt(
2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 2*sqrt(2)*sin(1/4
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2))*sqrt(a)*sqrt(e)/(d*(-36
864*I*cos(6*d*x + 6*c) - 110592*I*cos(4*d*x + 4*c) - 110592*I*cos(2*d*x + 2
*c) + 36864*sin(6*d*x + 6*c) + 110592*sin(4*d*x + 4*c) + 110592*sin(2*d*x +
 2*c) - 36864*I))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(\frac{e}{\cos (c+d\,x)}\right)^{5/2}\,{\left(a+a\,\tan \left(c+d\,x\right)\,1{}\mathrm{i}\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(5/2)*(a + a*tan(c + d*x)*1i)^(3/2),x)
```

```
[Out] int((e/cos(c + d*x))^(5/2)*(a + a*tan(c + d*x)*1i)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(5/2)*(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

3.401 $\int (e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^{3/2}\,dx$

Optimal. Leaf size=571

$$-\frac{5ia^{5/2}e^{3/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{4\sqrt{2}d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}+\frac{5ia^{5/2}e^{3/2}\sec(c+dx)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{4\sqrt{2}d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}+$$

```
[Out] 5/4*I*a^2*(e*sec(d*x+c))^(3/2)/d/(a+I*a*tan(d*x+c))^(1/2)-5/8*I*a^(5/2)*e^(
3/2)*arctan(1-2^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*sec(d*x+c
))^(1/2))*sec(d*x+c)/d*2^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^
(1/2)+5/8*I*a^(5/2)*e^(3/2)*arctan(1+2^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/
2)/a^(1/2)/(e*sec(d*x+c))^(1/2))*sec(d*x+c)/d*2^(1/2)/(a-I*a*tan(d*x+c))^(1
/2)/(a+I*a*tan(d*x+c))^(1/2)+5/16*I*a^(5/2)*e^(3/2)*ln(a-2^(1/2)*a^(1/2)*e^
(1/2)*(a-I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2)+cos(d*x+c)*(a-I*a*tan(d
*x+c)))*sec(d*x+c)/d*2^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1
/2)-5/16*I*a^(5/2)*e^(3/2)*ln(a+2^(1/2)*a^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^
(1/2)/(e*sec(d*x+c))^(1/2)+cos(d*x+c)*(a-I*a*tan(d*x+c)))*sec(d*x+c)/d*2^(1
/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)+1/2*I*a*(e*sec(d*x+c)
)^(3/2)*(a+I*a*tan(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.54, antiderivative size = 571, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 9, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {3498, 3499, 3495, 297, 1162, 617, 204, 1165, 628}

$$-\frac{5ia^{5/2}e^{3/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{4\sqrt{2}d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}+\frac{5ia^{5/2}e^{3/2}\sec(c+dx)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{4\sqrt{2}d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}+$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((5*I)/4)*a^2*(e*Sec[c + d*x])^(3/2))/(d*Sqrt[a + I*a*Tan[c + d*x]]) - (((
5*I)/4)*a^(5/2)*e^(3/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*
x]])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])]*Sec[c + d*x])/(Sqrt[2]*d*Sqrt[a - I*a*
Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) + (((5*I)/4)*a^(5/2)*e^(3/2)*ArcT
an[1 + (Sqrt[2]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])/(Sqrt[a]*Sqrt[e*Sec[c +
 d*x]])]*Sec[c + d*x])/(Sqrt[2]*d*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*T
an[c + d*x]]) + (((5*I)/8)*a^(5/2)*e^(3/2)*Log[a - (Sqrt[2]*Sqrt[a]*Sqrt[e]
*Sqrt[a - I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a - I*a*T
an[c + d*x])]*Sec[c + d*x])/(Sqrt[2]*d*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a +
I*a*Tan[c + d*x]]) - (((5*I)/8)*a^(5/2)*e^(3/2)*Log[a + (Sqrt[2]*Sqrt[a]*Sq
rt[e]*Sqrt[a - I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a -
I*a*Tan[c + d*x])]*Sec[c + d*x])/(Sqrt[2]*d*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt
[a + I*a*Tan[c + d*x]]) + ((I/2)*a*(e*Sec[c + d*x])^(3/2)*Sqrt[a + I*a*Tan[
c + d*x]])/d
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
```

```
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3495

```
Int[Sqrt[(d_.)*sec[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[(-4*b*d^2)/f, Subst[Int[x^2/(a^2 + d^2*x^4), x],
 x, Sqrt[a + b*Tan[e + f*x]]/Sqrt[d*Sec[e + f*x]]], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3498

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m}, x] && EqQ[a^2 + b^2, 0] && GtQ[n, 0] && NeQ[m + n - 1, 0] && IntegersQ[
2*m, 2*n]
```

Rule 3499

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(3/2)/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_
.)*(x_)]], x_Symbol] :> Dist[(d*Sec[e + f*x])/(Sqrt[a - b*Tan[e + f*x]]*Sqr
t[a + b*Tan[e + f*x]]), Int[Sqrt[d*Sec[e + f*x]]*Sqrt[a - b*Tan[e + f*x]],
x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^{3/2}\,dx = \frac{ia(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}}{2d} + \frac{1}{4}(5a)\int (e\sec(c+d$$

$$= \frac{5ia^2(e\sec(c+dx))^{3/2}}{4d\sqrt{a+ia\tan(c+dx)}} + \frac{ia(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+d}}{2d}$$

$$= \frac{5ia^2(e\sec(c+dx))^{3/2}}{4d\sqrt{a+ia\tan(c+dx)}} + \frac{ia(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+d}}{2d}$$

$$= \frac{5ia^2(e\sec(c+dx))^{3/2}}{4d\sqrt{a+ia\tan(c+dx)}} + \frac{ia(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+d}}{2d}$$

$$= \frac{5ia^2(e\sec(c+dx))^{3/2}}{4d\sqrt{a+ia\tan(c+dx)}} + \frac{ia(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+d}}{2d}$$

$$= \frac{5ia^2(e\sec(c+dx))^{3/2}}{4d\sqrt{a+ia\tan(c+dx)}} + \frac{ia(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+d}}{2d}$$

$$= \frac{5ia^2(e\sec(c+dx))^{3/2}}{4d\sqrt{a+ia\tan(c+dx)}} + \frac{5ia^{5/2}e^{3/2}\log\left(a-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a-ia\tan(c+}}{\sqrt{e\sec(c+dx)}}\right.}{8\sqrt{2}\,d\sqrt{a-ia\tan}}$$

$$= \frac{5ia^2(e\sec(c+dx))^{3/2}}{4d\sqrt{a+ia\tan(c+dx)}} - \frac{5ia^{5/2}e^{3/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+d}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right.}{4\sqrt{2}\,d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia}}$$

Mathematica [B] time = 56.13, size = 11319, normalized size = 19.82

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] Result too large to show
```

fricas [A] time = 1.14, size = 538, normalized size = 0.94

$$\frac{\left(9i\,aee^{(2i\,dx+2i\,c)}+5i\,ae\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+\sqrt{\frac{25i\,a^3e^3}{16\,d^2}}\left(de^{(2i\,dx+2i\,c)}+d\right)\log\left(\frac{10\left(aee^{(2i\,dx+2i\,c)}+ae\right)}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="frica
s")
```

```
[Out] 1/2*((9*I*a*e*e^(2*I*d*x + 2*I*c) + 5*I*a*e)*sqrt(a/(e^(2*I*d*x + 2*I*c) +
1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + sqrt(25/16*
I*a^3*e^3/d^2)*(d*e^(2*I*d*x + 2*I*c) + d)*log(1/5*(10*(a*e*e^(2*I*d*x + 2*
I*c) + a*e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) +
 1))*e^(1/2*I*d*x + 1/2*I*c) + 8*I*sqrt(25/16*I*a^3*e^3/d^2)*d)/(a*e)) - sq
rt(25/16*I*a^3*e^3/d^2)*(d*e^(2*I*d*x + 2*I*c) + d)*log(1/5*(10*(a*e*e^(2*I
*d*x + 2*I*c) + a*e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x +
 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) - 8*I*sqrt(25/16*I*a^3*e^3/d^2)*d)/(a
*e)) + sqrt(-25/16*I*a^3*e^3/d^2)*(d*e^(2*I*d*x + 2*I*c) + d)*log(1/5*(10*(
```

```
a*e*e^(2*I*d*x + 2*I*c) + a*e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^
(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 8*I*sqrt(-25/16*I*a^3*e^3
/d^2)*d)/(a*e)) - sqrt(-25/16*I*a^3*e^3/d^2)*(d*e^(2*I*d*x + 2*I*c) + d)*lo
g(1/5*(10*(a*e*e^(2*I*d*x + 2*I*c) + a*e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))
*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) - 8*I*sqrt(-25/1
6*I*a^3*e^3/d^2)*d)/(a*e)))/(d*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e \sec (dx + c))^{\frac{3}{2}} (i\, a \tan (dx + c) + a)^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac"
)
```

```
[Out] integrate((e*sec(d*x + c))^(3/2)*(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [A] time = 1.29, size = 363, normalized size = 0.64

$$\frac{\left(\frac{e}{\cos(dx+c)}\right)^{\frac{3}{2}} \sqrt{\frac{a(i \sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\, (-1 + \cos (dx + c))^2 \left(5i \left(\cos^2 (dx + c)\right) \operatorname{arctanh}\left(\frac{\sqrt{\frac{1}{1+\cos(dx+c)}}\, (\cos(dx+c)+1+\sin(dx+}{2}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] 1/8/d*(e/cos(d*x+c))^(3/2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(
-1+cos(d*x+c))^2*(5*I*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(co
s(d*x+c)+1+sin(d*x+c)))-5*I*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/
2)*(cos(d*x+c)+1-sin(d*x+c)))+10*I*cos(d*x+c)*sin(d*x+c)*(1/(1+cos(d*x+c)))
^(1/2)+5*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+si
n(d*x+c)))+5*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+
1-sin(d*x+c)))-10*cos(d*x+c)^2*(1/(1+cos(d*x+c)))^(1/2)-4*I*sin(d*x+c)*(1/(
1+cos(d*x+c)))^(1/2)-14*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)-4*(1/(1+cos(d*x
+c)))^(1/2))/sin(d*x+c)^3/(I*sin(d*x+c)+cos(d*x+c)-1)/(1/(1+cos(d*x+c)))^(3
/2)*a
```

maxima [B] time = 1.11, size = 2380, normalized size = 4.17

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxim
a")
```

```
[Out] (4608*a*e*cos(5/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2560*a*e*c
os(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 4608*I*a*e*sin(5/4*ar
ctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2560*I*a*e*sin(1/4*arctan2(sin
(2*d*x + 2*c), cos(2*d*x + 2*c))) - (320*sqrt(2)*a*e*cos(4*d*x + 4*c) + 640
*sqrt(2)*a*e*cos(2*d*x + 2*c) + 320*I*sqrt(2)*a*e*sin(4*d*x + 4*c) + 640*I*
sqrt(2)*a*e*sin(2*d*x + 2*c) + 320*sqrt(2)*a*e)*arctan2(sqrt(2)*cos(1/4*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1, sqrt(2)*sin(1/4*arctan2(sin(
2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (320*sqrt(2)*a*e*cos(4*d*x + 4*c) +
 640*sqrt(2)*a*e*cos(2*d*x + 2*c) + 320*I*sqrt(2)*a*e*sin(4*d*x + 4*c) + 64
0*I*sqrt(2)*a*e*sin(2*d*x + 2*c) + 320*sqrt(2)*a*e)*arctan2(sqrt(2)*cos(1/4
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1, -sqrt(2)*sin(1/4*arctan2
```

```
(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (320*sqrt(2)*a*e*cos(4*d*x + 4
*c) + 640*sqrt(2)*a*e*cos(2*d*x + 2*c) + 320*I*sqrt(2)*a*e*sin(4*d*x + 4*c)
 + 640*I*sqrt(2)*a*e*sin(2*d*x + 2*c) + 320*sqrt(2)*a*e)*arctan2(sqrt(2)*co
s(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 1, sqrt(2)*sin(1/4*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (320*sqrt(2)*a*e*cos(4*d*x
 + 4*c) + 640*sqrt(2)*a*e*cos(2*d*x + 2*c) + 320*I*sqrt(2)*a*e*sin(4*d*x +
4*c) + 640*I*sqrt(2)*a*e*sin(2*d*x + 2*c) + 320*sqrt(2)*a*e)*arctan2(sqrt(2
)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 1, -sqrt(2)*sin(1/
4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (320*I*sqrt(2)*a*e*co
s(4*d*x + 4*c) + 640*I*sqrt(2)*a*e*cos(2*d*x + 2*c) - 320*sqrt(2)*a*e*sin(4
*d*x + 4*c) - 640*sqrt(2)*a*e*sin(2*d*x + 2*c) + 320*I*sqrt(2)*a*e)*arctan2
(sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))), sqrt(2)*cos(1/4*arctan2(sin(2*d*
x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c))) + 1) - (-320*I*sqrt(2)*a*e*cos(4*d*x + 4*c) - 640*I*sqrt(2)*a*e*co
s(2*d*x + 2*c) + 320*sqrt(2)*a*e*sin(4*d*x + 4*c) + 640*sqrt(2)*a*e*sin(2*d
*x + 2*c) - 320*I*sqrt(2)*a*e)*arctan2(-sqrt(2)*sin(1/4*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2
*c))), -sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(
1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (160*sqrt(2)*a*e*co
s(4*d*x + 4*c) + 320*sqrt(2)*a*e*cos(2*d*x + 2*c) + 160*I*sqrt(2)*a*e*sin(4
*d*x + 4*c) + 320*I*sqrt(2)*a*e*sin(2*d*x + 2*c) + 160*sqrt(2)*a*e)*log(2*s
qrt(2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/4*arctan2
(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2*(sqrt(2)*cos(1/4*arctan2(sin(2*d*
x + 2*c), cos(2*d*x + 2*c))) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*co
s(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(
2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c))) + 1) + (160*sqrt(2)*a*e*cos(4*d*x + 4*c) + 320*sqrt(2)*a*e*cos(2*d
*x + 2*c) + 160*I*sqrt(2)*a*e*sin(4*d*x + 4*c) + 320*I*sqrt(2)*a*e*sin(2*d*
x + 2*c) + 160*sqrt(2)*a*e)*log(-2*sqrt(2)*sin(1/2*arctan2(sin(2*d*x + 2*c)
, cos(2*d*x + 2*c)))*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) -
 2*(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 1)*cos(1
/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x
 + 2*c), cos(2*d*x + 2*c)))^2 + 2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*
sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*
arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (160*I*sqrt(2)*a*e*cos(
4*d*x + 4*c) + 320*I*sqrt(2)*a*e*cos(2*d*x + 2*c) - 160*sqrt(2)*a*e*sin(4*d
*x + 4*c) - 320*sqrt(2)*a*e*sin(2*d*x + 2*c) + 160*I*sqrt(2)*a*e)*log(2*cos
(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin
(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c))) + 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c))) + 2) - (-160*I*sqrt(2)*a*e*cos(4*d*x + 4*c) - 320*I*sqrt(2)
*a*e*cos(2*d*x + 2*c) + 160*sqrt(2)*a*e*sin(4*d*x + 4*c) + 320*sqrt(2)*a*e*
sin(2*d*x + 2*c) - 160*I*sqrt(2)*a*e)*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c
), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2
*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) -
2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) - (160*
I*sqrt(2)*a*e*cos(4*d*x + 4*c) + 320*I*sqrt(2)*a*e*cos(2*d*x + 2*c) - 160*s
qrt(2)*a*e*sin(4*d*x + 4*c) - 320*sqrt(2)*a*e*sin(2*d*x + 2*c) + 160*I*sqrt
(2)*a*e)*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*s
in(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*a
rctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2*sqrt(2)*sin(1/4*arctan2(sin
(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) - (-160*I*sqrt(2)*a*e*cos(4*d*x + 4*
c) - 320*I*sqrt(2)*a*e*cos(2*d*x + 2*c) + 160*sqrt(2)*a*e*sin(4*d*x + 4*c)
+ 320*sqrt(2)*a*e*sin(2*d*x + 2*c) - 160*I*sqrt(2)*a*e)*log(2*cos(1/4*arcta
n2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2
```

```
*c), cos(2*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c))) - 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2
*c))) + 2))*sqrt(a)*sqrt(e)/(d*(-1024*I*cos(4*d*x + 4*c) - 2048*I*cos(2*d*x
 + 2*c) + 1024*sin(4*d*x + 4*c) + 2048*sin(2*d*x + 2*c) - 1024*I))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(\frac{e}{\cos (c + d\,x)}\right)^{3/2}\,(a + a\tan (c + d\,x)\;1\mathrm{i})^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^(3/2),x)
[Out] int((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(3/2)*(a+I*a*tan(d*x+c))**(3/2),x)
[Out] Timed out
```

3.402 $\int \sqrt{e \sec(c+dx)}\,(a+ia\tan(c+dx))^{3/2}\,dx$

Optimal. Leaf size=364

$$\frac{3ia^{3/2}\sqrt{e}\,\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\,d}-\frac{3ia^{3/2}\sqrt{e}\,\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\,d}-3ia^{3/2}\sqrt{e}\,\log\Bigg(-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{}}{\sqrt{e\,\mathrm{se}}}$$

```
[Out] 3/2*I*a^(3/2)*arctan(1-2^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*
sec(d*x+c))^(1/2))*e^(1/2)/d*2^(1/2)-3/2*I*a^(3/2)*arctan(1+2^(1/2)*e^(1/2)
*(a+I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*sec(d*x+c))^(1/2))*e^(1/2)/d*2^(1/2)-3
/4*I*a^(3/2)*ln(a-2^(1/2)*a^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/(e*sec(d
*x+c))^(1/2)+cos(d*x+c)*(a+I*a*tan(d*x+c)))*e^(1/2)/d*2^(1/2)+3/4*I*a^(3/2)
*ln(a+2^(1/2)*a^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2)
+cos(d*x+c)*(a+I*a*tan(d*x+c)))*e^(1/2)/d*2^(1/2)+I*a*(e*sec(d*x+c))^(1/2)*
(a+I*a*tan(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.32, antiderivative size = 364, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {3498, 3495, 297, 1162, 617, 204, 1165, 628}

$$\frac{3ia^{3/2}\sqrt{e}\,\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\,d}-\frac{3ia^{3/2}\sqrt{e}\,\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\,d}-3ia^{3/2}\sqrt{e}\,\log\Bigg(-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{}}{\sqrt{e\,\mathrm{se}}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] ((3*I)*a^(3/2)*Sqrt[e]*ArcTan[1 - (Sqrt[2]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x
]])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])]])/(Sqrt[2]*d) - ((3*I)*a^(3/2)*Sqrt[e]*A
rcTan[1 + (Sqrt[2]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]])/(Sqrt[a]*Sqrt[e*Sec[
c + d*x]])]])/(Sqrt[2]*d) - (((3*I)/2)*a^(3/2)*Sqrt[e]*Log[a - (Sqrt[2]*Sqrt
[a]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]
*(a + I*a*Tan[c + d*x])]])/(Sqrt[2]*d) + (((3*I)/2)*a^(3/2)*Sqrt[e]*Log[a +
(Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] +
 Cos[c + d*x]*(a + I*a*Tan[c + d*x])]])/(Sqrt[2]*d) + (I*a*Sqrt[e*Sec[c + d*
x]]*Sqrt[a + I*a*Tan[c + d*x]])/d
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3495

```
Int[Sqrt[(d_.)*sec[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[(-4*b*d^2)/f, Subst[Int[x^2/(a^2 + d^2*x^4), x],
 x, Sqrt[a + b*Tan[e + f*x]]/Sqrt[d*Sec[e + f*x]]], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3498

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m}, x] && EqQ[a^2 + b^2, 0] && GtQ[n, 0] && NeQ[m + n - 1, 0] && IntegersQ[
2*m, 2*n]
```

Rubi steps

$$\int \sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^{3/2}\,dx = \frac{ia\sqrt{e\sec(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}{d}+\frac{1}{2}(3a)\int \sqrt{e\sec(c+dx)}\,\sqrt{a \cdots$$

$$= \frac{ia\sqrt{e\sec(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}{d}-\frac{\left(6ia^2e^2\right)\text{Subst}\left(\int \frac{x^2}{a^2+e^2x^4}\,d \cdots\right.}{d}$$

$$= \frac{ia\sqrt{e\sec(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}{d}+\frac{\left(3ia^2e\right)\text{Subst}\left(\int \frac{a-ex^2}{a^2+e^2x^4}\,dx \cdots\right.}{d}$$

$$= \frac{ia\sqrt{e\sec(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}{d}-\frac{\left(3ia^2\right)\text{Subst}\left(\int \frac{1}{\frac{a}{e}-\frac{\sqrt{2}\sqrt{a}\,x}{\sqrt{e}}+x \cdots}\right.}{2d}$$

$$= -\frac{3ia^{3/2}\sqrt{e}\,\log\left(a-\frac{\sqrt{2}\sqrt{a}\,\sqrt{e}\,\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}+\cos(c+dx)(a+ia\tan(\cdots\right.}{2\sqrt{2}\,d}$$

$$= \frac{3ia^{3/2}\sqrt{e}\,\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\,\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\,\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\,d}-\frac{3ia^{3/2}\sqrt{e}\,\tan^{-1}\left(1+\frac{\sqrt{2} \cdots}{\cdots}\right.}{\sqrt{2}\,d}$$

Mathematica [A] time = 3.35, size = 338, normalized size = 0.93

$$\frac{ae\sqrt{a+ia\tan(c+dx)}\left(-3\sqrt{-\sin(c)-i\cos(c)-1}\sqrt{-\sin(c)+i\cos(c)+1}\sqrt{\tan\left(\frac{dx}{2}\right)+i}\tanh^{-1}\left(\frac{\sqrt{\sin(c)-i\cos(c}}{\sqrt{-\sin(c)-i\cos}}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (a*e*(I*Sec[c + d*x]*Sqrt[1 + Cos[2*c] + I*Sin[2*c]]*Sqrt[I - Tan[(d*x)/2]]
 - 3*ArcTanh[(Sqrt[1 - I*Cos[c] + Sin[c]]*Sqrt[I - Tan[(d*x)/2]])/(Sqrt[-1
- I*Cos[c] - Sin[c]]*Sqrt[I + Tan[(d*x)/2]])]*Sqrt[-1 - I*Cos[c] - Sin[c]]*
Sqrt[1 + I*Cos[c] - Sin[c]]*Sqrt[I + Tan[(d*x)/2]] + 3*ArcTanh[(Sqrt[1 + I*
Cos[c] - Sin[c]]*Sqrt[I - Tan[(d*x)/2]])/(Sqrt[-1 + I*Cos[c] + Sin[c]]*Sqrt
[I + Tan[(d*x)/2]])]*Sqrt[1 - I*Cos[c] + Sin[c]]*Sqrt[-1 + I*Cos[c] + Sin[c
]]*Sqrt[I + Tan[(d*x)/2]])*Sqrt[a + I*a*Tan[c + d*x]])/(d*Sqrt[e*Sec[c + d*
x]]*Sqrt[1 + Cos[2*c] + I*Sin[2*c]]*Sqrt[I - Tan[(d*x)/2]])
```

fricas [A] time = 0.59, size = 420, normalized size = 1.15

$$\frac{4ia\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}e^{\left(\frac{3}{2}idx+\frac{3}{2}ic\right)}+\sqrt{\frac{9ia^3e}{d^2}}d\log\left(\frac{2\left(3\left(ae^{(2idx+2ic)}+a\right)\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}e^{\left(\frac{1}{2}idx+\frac{1}{2}ic\right)}+\sqrt{9i}\right.}{3a}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="frica
s")
```

```
[Out] 1/2*(4*I*a*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) +
1))*e^(3/2*I*d*x + 3/2*I*c) + sqrt(9*I*a^3*e/d^2)*d*log(2/3*(3*(a*e^(2*I*d*
x + 2*I*c) + a)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*
c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + sqrt(9*I*a^3*e/d^2)*d)/a) - sqrt(9*I*a^3
*e/d^2)*d*log(2/3*(3*(a*e^(2*I*d*x + 2*I*c) + a)*sqrt(a/(e^(2*I*d*x + 2*I*c
) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) - sqrt(9*
I*a^3*e/d^2)*d)/a) - sqrt(-9*I*a^3*e/d^2)*d*log(2/3*(3*(a*e^(2*I*d*x + 2*I*
c) + a)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))
*e^(1/2*I*d*x + 1/2*I*c) + sqrt(-9*I*a^3*e/d^2)*d)/a) + sqrt(-9*I*a^3*e/d^2
)*d*log(2/3*(3*(a*e^(2*I*d*x + 2*I*c) + a)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1)
)*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) - sqrt(-9*I*a^3
*e/d^2)*d)/a))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{e\sec(dx+c)}\,(ia\tan(dx+c)+a)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac"
)
```

```
[Out] integrate(sqrt(e*sec(d*x + c))*(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [A] time = 1.30, size = 304, normalized size = 0.84

$$-\frac{\sqrt{\frac{e}{\cos(dx+c)}}\,\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\,(-1+\cos(dx+c))\left(3i\cos(dx+c)\operatorname{arctanh}\left(\frac{\sqrt{\frac{1}{1+\cos(dx+c)}}\,(\cos(dx+c)+1+\sin(dx+c))}{2}\right)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] -1/2/d*(e/cos(d*x+c))^(1/2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*
(-1+cos(d*x+c))*(3*I*cos(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d
*x+c)+1+sin(d*x+c)))-3*I*cos(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(c
os(d*x+c)+1-sin(d*x+c)))-2*I*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)-3*cos(d*x+
c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))-3*cos(d*
x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))-2*cos(
d*x+c)*(1/(1+cos(d*x+c)))^(1/2)-2*(1/(1+cos(d*x+c)))^(1/2))/sin(d*x+c)/(1/(
1+cos(d*x+c)))^(1/2)/(I*sin(d*x+c)+cos(d*x+c)-1)*a
```

maxima [B] time = 1.13, size = 1881, normalized size = 5.17

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxim
a")
```

```
[Out] -((48*sqrt(2)*a*cos(2*d*x + 2*c) + 48*I*sqrt(2)*a*sin(2*d*x + 2*c) + 48*sqr
t(2)*a)*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))
) + 1, sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) +
(48*sqrt(2)*a*cos(2*d*x + 2*c) + 48*I*sqrt(2)*a*sin(2*d*x + 2*c) + 48*sqrt(
2)*a)*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
+ 1, -sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (
48*sqrt(2)*a*cos(2*d*x + 2*c) + 48*I*sqrt(2)*a*sin(2*d*x + 2*c) + 48*sqrt(2
)*a)*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) -
 1, sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (48
*sqrt(2)*a*cos(2*d*x + 2*c) + 48*I*sqrt(2)*a*sin(2*d*x + 2*c) + 48*sqrt(2)*
a)*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 1
, -sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (48*
I*sqrt(2)*a*cos(2*d*x + 2*c) - 48*sqrt(2)*a*sin(2*d*x + 2*c) + 48*I*sqrt(2)
*a)*arctan2(sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) +
sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))), sqrt(2)*cos(1/4*arcta
n2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c))) + 1) - (-48*I*sqrt(2)*a*cos(2*d*x + 2*c) + 48*sqrt(2)*a
*sin(2*d*x + 2*c) - 48*I*sqrt(2)*a)*arctan2(-sqrt(2)*sin(1/4*arctan2(sin(2*
d*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*
x + 2*c))), -sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) +
 cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - 128*a*cos(3/4*
arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - (24*sqrt(2)*a*cos(2*d*x + 2*
c) + 24*I*sqrt(2)*a*sin(2*d*x + 2*c) + 24*sqrt(2)*a)*log(2*sqrt(2)*sin(1/2*
arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/4*arctan2(sin(2*d*x + 2*
c), cos(2*d*x + 2*c))) + 2*(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c))) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + c
os(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*cos(1/4*arctan2(s
in(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), c
os(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))
)^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) +
 (24*sqrt(2)*a*cos(2*d*x + 2*c) + 24*I*sqrt(2)*a*sin(2*d*x + 2*c) + 24*sqrt
```

```
(2)*a)*log(-2*sqrt(2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*
sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 2*(sqrt(2)*cos(1/4*a
rctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 1)*cos(1/2*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
2*c)))^2 + 2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1
/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c))) + 1) - (-24*I*sqrt(2)*a*cos(2*d*x + 2*c) + 24*sqrt(
2)*a*sin(2*d*x + 2*c) - 24*I*sqrt(2)*a)*log(2*cos(1/4*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
 2*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
+ 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) - (24
*I*sqrt(2)*a*cos(2*d*x + 2*c) - 24*sqrt(2)*a*sin(2*d*x + 2*c) + 24*I*sqrt(2
)*a)*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1
/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt(2)*cos(1/4*arcta
n2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 2*sqrt(2)*sin(1/4*arctan2(sin(2*d
*x + 2*c), cos(2*d*x + 2*c))) + 2) - (-24*I*sqrt(2)*a*cos(2*d*x + 2*c) + 24
*sqrt(2)*a*sin(2*d*x + 2*c) - 24*I*sqrt(2)*a)*log(2*cos(1/4*arctan2(sin(2*d
*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2
*c))) + 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2)
 - (24*I*sqrt(2)*a*cos(2*d*x + 2*c) - 24*sqrt(2)*a*sin(2*d*x + 2*c) + 24*I*
sqrt(2)*a)*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2
*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 2*sqrt(2)*sin(1/4*arctan2(s
in(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) - 128*I*a*sin(3/4*arctan2(sin(2*d*
x + 2*c), cos(2*d*x + 2*c))))*sqrt(a)*sqrt(e)/(d*(-64*I*cos(2*d*x + 2*c) +
64*sin(2*d*x + 2*c) - 64*I))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \sqrt{\frac{e}{\cos(c+d\,x)}}\,\left(a+a\tan(c+d\,x)\,1\mathrm{i}\right)^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^(3/2),x)
[Out] int((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{e\sec(c+dx)}\,\left(ia\left(\tan(c+dx)-i\right)\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(1/2)*(a+I*a*tan(d*x+c))**(3/2),x)
[Out] Integral(sqrt(e*sec(c + d*x))*(I*a*(tan(c + d*x) - I))**(3/2), x)
```

3.403 $\int \frac{(a+ia\tan(c+dx))^{3/2}}{\sqrt{e\sec(c+dx)}}\,dx$

Optimal. Leaf size=520

$$\frac{i\sqrt{2}\,a^{5/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{d\sqrt{e}\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}-\frac{i\sqrt{2}\,a^{5/2}\sec(c+dx)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{d\sqrt{e}\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}-\frac{ia^{5/2}\,\text{se}}{}$$

```
[Out] -1/2*I*a^(5/2)*ln(a-2^(1/2)*a^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/(e*sec
(d*x+c))^(1/2)+cos(d*x+c)*(a-I*a*tan(d*x+c)))*sec(d*x+c)/d*2^(1/2)/e^(1/2)/
(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)+1/2*I*a^(5/2)*ln(a+2^(1/2
)*a^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2)+cos(d*x+c)*
(a-I*a*tan(d*x+c)))*sec(d*x+c)/d*2^(1/2)/e^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(
a+I*a*tan(d*x+c))^(1/2)+I*a^(5/2)*arctan(1-2^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c
))^(1/2)/a^(1/2)/(e*sec(d*x+c))^(1/2))*sec(d*x+c)*2^(1/2)/d/e^(1/2)/(a-I*a*
tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)-I*a^(5/2)*arctan(1+2^(1/2)*e^(1/
2)*(a-I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*sec(d*x+c))^(1/2))*sec(d*x+c)*2^(1/2
)/d/e^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)-4*I*a*(a+I*a*
tan(d*x+c))^(1/2)/d/(e*sec(d*x+c))^(1/2)
```

Rubi [A] time = 0.43, antiderivative size = 520, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {3496, 3499, 3495, 297, 1162, 617, 204, 1165, 628}

$$\frac{i\sqrt{2}\,a^{5/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{d\sqrt{e}\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}-\frac{i\sqrt{2}\,a^{5/2}\sec(c+dx)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{d\sqrt{e}\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}-\frac{ia^{5/2}\,\text{se}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^(3/2)/Sqrt[e*Sec[c + d*x]],x]
```

```
[Out] (I*Sqrt[2]*a^(5/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])/
(Sqrt[a]*Sqrt[e*Sec[c + d*x]])]*Sec[c + d*x])/(d*Sqrt[e]*Sqrt[a - I*a*Tan[c
 + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) - (I*Sqrt[2]*a^(5/2)*ArcTan[1 + (Sqrt[
2]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])]*Sec[
c + d*x])/(d*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]])
 - (I*a^(5/2)*Log[a - (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])/
Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a - I*a*Tan[c + d*x])]*Sec[c + d*x])/(
Sqrt[2]*d*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) +
(I*a^(5/2)*Log[a + (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])/Sqr
t[e*Sec[c + d*x]] + Cos[c + d*x]*(a - I*a*Tan[c + d*x])]*Sec[c + d*x])/(Sqr
t[2]*d*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) - ((4
*I)*a*Sqrt[a + I*a*Tan[c + d*x]])/(d*Sqrt[e*Sec[c + d*x]])
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3495

```
Int[Sqrt[(d_.)*sec[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[(-4*b*d^2)/f, Subst[Int[x^2/(a^2 + d^2*x^4), x],
 x, Sqrt[a + b*Tan[e + f*x]]/Sqrt[d*Sec[e + f*x]]], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3499

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(3/2)/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_
.)*(x_)]], x_Symbol] :> Dist[(d*Sec[e + f*x])/(Sqrt[a - b*Tan[e + f*x]]*Sqr
t[a + b*Tan[e + f*x]]), Int[Sqrt[d*Sec[e + f*x]]*Sqrt[a - b*Tan[e + f*x]],
x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^{3/2}}{\sqrt{e\sec(c+dx)}}\,dx = -\frac{4ia\sqrt{a+ia\tan(c+dx)}}{d\sqrt{e\sec(c+dx)}} - \frac{a^2\int \frac{(e\sec(c+dx))^{3/2}}{\sqrt{a+ia\tan(c+dx)}}\,dx}{e^2}$$

$$= -\frac{4ia\sqrt{a+ia\tan(c+dx)}}{d\sqrt{e\sec(c+dx)}} - \frac{\left(a^2\sec(c+dx)\right)\int \sqrt{e\sec(c+dx)}\sqrt{a-ia\tan(c+dx)}}{e\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}$$

$$= -\frac{4ia\sqrt{a+ia\tan(c+dx)}}{d\sqrt{e\sec(c+dx)}} - \frac{\left(4ia^3e\sec(c+dx)\right)\text{Subst}\left(\int \frac{x^2}{a^2+e^2x^4}\,dx, x, \frac{\sqrt{a-ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\right.}{d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}$$

$$= -\frac{4ia\sqrt{a+ia\tan(c+dx)}}{d\sqrt{e\sec(c+dx)}} + \frac{\left(2ia^3\sec(c+dx)\right)\text{Subst}\left(\int \frac{a-ex^2}{a^2+e^2x^4}\,dx, x, \frac{\sqrt{a-ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\right.}{d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}$$

$$= -\frac{4ia\sqrt{a+ia\tan(c+dx)}}{d\sqrt{e\sec(c+dx)}} - \frac{\left(ia^3\sec(c+dx)\right)\text{Subst}\left(\int \frac{1}{\frac{a}{e}-\frac{\sqrt{2}\sqrt{a}x}{\sqrt{e}}+x^2}\,dx, x, \frac{\sqrt{a-ia\tan(c}}{\sqrt{e\sec(c+}}\right.}{de\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}$$

$$= -\frac{ia^{5/2}\log\left(a-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}+\cos(c+dx)(a-ia\tan(c+dx))\right)\sec(c+dx}{\sqrt{2}d\sqrt{e}\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}$$

$$= \frac{i\sqrt{2}a^{5/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)\sec(c+dx)}{d\sqrt{e}\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}} - \frac{i\sqrt{2}a^{5/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a-}}{\sqrt{a}\sqrt{e}}\right.}{d\sqrt{e}\sqrt{a-ia\tan(c+dx)}}$$

Mathematica [B] time = 6.17, size = 11314, normalized size = 21.76

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^(3/2)/Sqrt[e*Sec[c + d*x]],x]
[Out] Result too large to show
```

fricas [A] time = 0.57, size = 460, normalized size = 0.88

$$-\frac{de\sqrt{\frac{4ia^3}{d^2e}}\log\left(\frac{2\left(ae^{(2idx+2ic)}+a\right)\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}e^{\left(\frac{1}{2}idx+\frac{1}{2}ic\right)}+ide\sqrt{\frac{4ia^3}{d^2e}}}{a}\right)-de\sqrt{\frac{4ia^3}{d^2e}}\log\left(\frac{2\left(ae^{(2idx+2ic)}+a\right)\sqrt{\frac{a}{e^{(2idx+2ic)}}}}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(3/2)/(e*sec(d*x+c))^(1/2),x, algorithm="frica
s")
[Out] -1/2*(d*e*sqrt(4*I*a^3/(d^2*e))*log((2*(a*e^(2*I*d*x + 2*I*c) + a)*sqrt(a/(
e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x +
1/2*I*c) + I*d*e*sqrt(4*I*a^3/(d^2*e)))/a) - d*e*sqrt(4*I*a^3/(d^2*e))*log(
(2*(a*e^(2*I*d*x + 2*I*c) + a)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^
(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) - I*d*e*sqrt(4*I*a^3/(d^2*e
)))/a) + d*e*sqrt(-4*I*a^3/(d^2*e))*log((2*(a*e^(2*I*d*x + 2*I*c) + a)*sqrt
(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*
x + 1/2*I*c) + I*d*e*sqrt(-4*I*a^3/(d^2*e)))/a) - d*e*sqrt(-4*I*a^3/(d^2*e)
)*log((2*(a*e^(2*I*d*x + 2*I*c) + a)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt
(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) - I*d*e*sqrt(-4*I*a^3
/(d^2*e)))/a) - 2*(-4*I*a*e^(2*I*d*x + 2*I*c) - 4*I*a)*sqrt(a/(e^(2*I*d*x +
```

```
2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))/(d
*e)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(i\,a\tan(dx+c)+a)^{\frac{3}{2}}}{\sqrt{e\sec(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(3/2)/(e*sec(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(3/2)/sqrt(e*sec(d*x + c)), x)
```

maple [A] time = 1.24, size = 286, normalized size = 0.55

$$-\frac{\left(i\operatorname{arctanh}\left(\frac{\sqrt{\frac{1}{1+\cos(dx+c)}}\,(\cos(dx+c)+1+\sin(dx+c))}{2}\right)\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sin(dx+c)-i\operatorname{arctanh}\left(\frac{\sqrt{\frac{1}{1+\cos(dx+c)}}\,(\cos(dx+c)+1-\sin}{2}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^(3/2)/(e*sec(d*x+c))^(1/2),x)
```

```
[Out] -1/d*(I*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))*(1/
(1+cos(d*x+c)))^(1/2)*sin(d*x+c)-I*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(co
s(d*x+c)+1-sin(d*x+c)))*(1/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)+arctanh(1/2*(1/
(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))*(1/(1+cos(d*x+c)))^(1/2)*s
in(d*x+c)+arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))*(
1/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)+4*I*cos(d*x+c)-4*I-4*sin(d*x+c))*(a*(I*s
in(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/(I*sin(d*x+c)+cos(d*x+c)-1)/(e/cos(
d*x+c))^(1/2)*a
```

maxima [B] time = 0.90, size = 1462, normalized size = 2.81

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(3/2)/(e*sec(d*x+c))^(1/2),x, algorithm="maxim
a")
```

```
[Out] 1/4*(2*I*sqrt(2)*a*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*
d*x + 2*c))) + 1, sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c
))) + 1) + 2*I*sqrt(2)*a*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c),
cos(2*d*x + 2*c))) + 1, -sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*
x + 2*c))) + 1) + 2*I*sqrt(2)*a*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c))) - 1, sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c))) + 1) + 2*I*sqrt(2)*a*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c))) - 1, -sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c))) + 1) - 2*sqrt(2)*a*arctan2(sqrt(2)*sin(1/4*arctan2(
sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c))), sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c
))) + cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + 2*sqrt(2)
*a*arctan2(-sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) +
sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))), -sqrt(2)*cos(1/4*arct
an2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x + 2*c)
, cos(2*d*x + 2*c))) + 1) + I*sqrt(2)*a*log(2*sqrt(2)*sin(1/2*arctan2(sin(2
```

```
*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c))) + 2*(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
 + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arctan
2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*cos(1/4*arctan2(sin(2*d*x + 2*
c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*
c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt(
2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - I*sqrt(2)*a*
log(-2*sqrt(2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/4
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 2*(sqrt(2)*cos(1/4*arctan2(
sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 1)*cos(1/2*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^
2 + 2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arct
an2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x +
2*c), cos(2*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c))) + 1) - sqrt(2)*a*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), c
os(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))
)^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2*sq
rt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) + sqrt(2)*a
*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*a
rctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(s
in(2*d*x + 2*c), cos(2*d*x + 2*c))) - 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c))) + 2) - sqrt(2)*a*log(2*cos(1/4*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*
x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
)) + 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) +
sqrt(2)*a*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*
sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*
arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 2*sqrt(2)*sin(1/4*arctan2(si
n(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) - 16*I*a*cos(1/4*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c))) + 16*a*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c))))*sqrt(a)/(d*sqrt(e))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + a\tan(c + d\,x)\,1\mathrm{i})^{3/2}}{\sqrt{\frac{e}{\cos(c+d\,x)}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(3/2)/(e/cos(c + d*x))^(1/2),x)
[Out] int((a + a*tan(c + d*x)*1i)^(3/2)/(e/cos(c + d*x))^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ia\,(\tan(c + dx) - i))^{\frac{3}{2}}}{\sqrt{e\sec(c + dx)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**(3/2)/(e*sec(d*x+c))**(1/2),x)
[Out] Integral((I*a*(tan(c + d*x) - I))**(3/2)/sqrt(e*sec(c + d*x)), x)
```

3.404 $\int \frac{(a+ia\tan(c+dx))^{3/2}}{(e\sec(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=38

$$-\frac{2i(a+ia\tan(c+dx))^{3/2}}{3d(e\sec(c+dx))^{3/2}}$$

```
[Out] -2/3*I*(a+I*a*tan(d*x+c))^(3/2)/d/(e*sec(d*x+c))^(3/2)
```

Rubi [A] time = 0.09, antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.033, Rules used = {3488}

$$-\frac{2i(a+ia\tan(c+dx))^{3/2}}{3d(e\sec(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^(3/2)/(e*Sec[c + d*x])^(3/2),x]
```

```
[Out] (((-2*I)/3)*(a + I*a*Tan[c + d*x])^(3/2))/(d*(e*Sec[c + d*x])^(3/2))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^{3/2}}{(e\sec(c+dx))^{3/2}}\,dx=-\frac{2i(a+ia\tan(c+dx))^{3/2}}{3d(e\sec(c+dx))^{3/2}}$$

Mathematica [A] time = 0.07, size = 38, normalized size = 1.00

$$-\frac{2i(a+ia\tan(c+dx))^{3/2}}{3d(e\sec(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^(3/2)/(e*Sec[c + d*x])^(3/2),x]
```

```
[Out] (((-2*I)/3)*(a + I*a*Tan[c + d*x])^(3/2))/(d*(e*Sec[c + d*x])^(3/2))
```

fricas [B] time = 0.47, size = 76, normalized size = 2.00

$$\frac{2\left(-i\,ae^{(3i\,dx+3i\,c)}-i\,ae^{(i\,dx+i\,c)}\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\,\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}}{3\,de^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(3/2)/(e*sec(d*x+c))^(3/2),x, algorithm="frica
s")
```

```
[Out] 2/3*(-I*a*e^(3*I*d*x + 3*I*c) - I*a*e^(I*d*x + I*c))*sqrt(a/(e^(2*I*d*x + 2
*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(d*e^
2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(i\,a\tan(dx+c)+a)^{\frac{3}{2}}}{(e\sec(dx+c))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(3/2)/(e*sec(d*x+c))^(3/2),x, algorithm="giac"
)
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(3/2)/(e*sec(d*x + c))^(3/2), x)
```

maple [B] time = 1.20, size = 76, normalized size = 2.00

$$-\frac{2\left(i\cos(dx+c)-\sin(dx+c)\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\,\left(\frac{e}{\cos(dx+c)}\right)^{\frac{3}{2}}\left(\cos^2(dx+c)\right)a}{3d\,e^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^(3/2)/(e*sec(d*x+c))^(3/2),x)
```

```
[Out] -2/3/d*(I*cos(d*x+c)-sin(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(
1/2)*(e/cos(d*x+c))^(3/2)*cos(d*x+c)^2/e^3*a
```

maxima [B] time = 0.87, size = 76, normalized size = 2.00

$$-\frac{2i\,a^{\frac{3}{2}}\left(-\frac{2i\sin(dx+c)}{\cos(dx+c)+1}+\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-1\right)^{\frac{3}{2}}}{3\,de^{\frac{3}{2}}\left(-\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-1\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(3/2)/(e*sec(d*x+c))^(3/2),x, algorithm="maxim
a")
```

```
[Out] -2/3*I*a^(3/2)*(-2*I*sin(d*x + c)/(cos(d*x + c) + 1) + sin(d*x + c)^2/(cos(
d*x + c) + 1)^2 - 1)^(3/2)/(d*e^(3/2)*(-sin(d*x + c)^2/(cos(d*x + c) + 1)^2
 - 1)^(3/2))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{(a+a\tan(c+d\,x)\,1\mathrm{i})^{3/2}}{\left(\frac{e}{\cos(c+d\,x)}\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(3/2)/(e/cos(c + d*x))^(3/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^(3/2)/(e/cos(c + d*x))^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ia(\tan(c+dx)-i))^{\frac{3}{2}}}{(e\sec(c+dx))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**(3/2)/(e*sec(d*x+c))**(3/2),x)
```

```
[Out] Integral((I*a*(tan(c + d*x) - I))**(3/2)/(e*sec(c + d*x))**(3/2), x)
```

3.405 $\int \frac{(a+ia\tan(c+dx))^{3/2}}{(e\sec(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=81

$$-\frac{4ia\sqrt{a+ia\tan(c+dx)}}{5de^2\sqrt{e\sec(c+dx)}}-\frac{2i(a+ia\tan(c+dx))^{3/2}}{5d(e\sec(c+dx))^{5/2}}$$

```
[Out] -4/5*I*a*(a+I*a*tan(d*x+c))^(1/2)/d/e^2/(e*sec(d*x+c))^(1/2)-2/5*I*(a+I*a*t
an(d*x+c))^(3/2)/d/(e*sec(d*x+c))^(5/2)
```

Rubi [A] time = 0.16, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {3497, 3488}

$$-\frac{4ia\sqrt{a+ia\tan(c+dx)}}{5de^2\sqrt{e\sec(c+dx)}}-\frac{2i(a+ia\tan(c+dx))^{3/2}}{5d(e\sec(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^(3/2)/(e*Sec[c + d*x])^(5/2),x]
```

```
[Out] (((-4*I)/5)*a*Sqrt[a + I*a*Tan[c + d*x]])/(d*e^2*Sqrt[e*Sec[c + d*x]]) - ((
(2*I)/5)*(a + I*a*Tan[c + d*x])^(3/2))/(d*(e*Sec[c + d*x])^(5/2))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rubi steps

$$\begin{aligned}\int \frac{(a+ia\tan(c+dx))^{3/2}}{(e\sec(c+dx))^{5/2}}\,dx &= -\frac{2i(a+ia\tan(c+dx))^{3/2}}{5d(e\sec(c+dx))^{5/2}}+\frac{(2a)\int \frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\,dx}{5e^2}\\ &= -\frac{4ia\sqrt{a+ia\tan(c+dx)}}{5de^2\sqrt{e\sec(c+dx)}}-\frac{2i(a+ia\tan(c+dx))^{3/2}}{5d(e\sec(c+dx))^{5/2}}\end{aligned}$$

Mathematica [A] time = 0.38, size = 84, normalized size = 1.04

$$-\frac{2a(2\tan(c+dx)+3i)(\cos(dx)-i\sin(dx))\sqrt{a+ia\tan(c+dx)}\,(\cos(c+2dx)+i\sin(c+2dx))}{5de(e\sec(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^(3/2)/(e*Sec[c + d*x])^(5/2),x]
```

```
[Out] (-2*a*(Cos[d*x] - I*Sin[d*x])*(Cos[c + 2*d*x] + I*Sin[c + 2*d*x])*(3*I + 2*
Tan[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])/(5*d*e*(e*Sec[c + d*x])^(3/2))
```

fricas [A] time = 0.78, size = 79, normalized size = 0.98

$$\frac{\left(-i\,ae^{(4i\,dx+4i\,c)}-6i\,ae^{(2i\,dx+2i\,c)}-5i\,a\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}}{5\,de^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(3/2)/(e*sec(d*x+c))^(5/2),x, algorithm="frica
s")
```

```
[Out] 1/5*(-I*a*e^(4*I*d*x + 4*I*c) - 6*I*a*e^(2*I*d*x + 2*I*c) - 5*I*a)*sqrt(a/(
e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x +
1/2*I*c)/(d*e^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(i\,a\tan(dx+c)+a)^{\frac{3}{2}}}{(e\sec(dx+c))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(3/2)/(e*sec(d*x+c))^(5/2),x, algorithm="giac"
)
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(3/2)/(e*sec(d*x + c))^(5/2), x)
```

maple [A] time = 1.19, size = 86, normalized size = 1.06

$$-\frac{2\left(i\left(\cos^2(dx+c)\right)-\cos(dx+c)\sin(dx+c)+2i\right)\left(\cos^3(dx+c)\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(\frac{e}{\cos(dx+c)}\right)^{\frac{5}{2}}a}{5d\,e^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^(3/2)/(e*sec(d*x+c))^(5/2),x)
```

```
[Out] -2/5/d*(I*cos(d*x+c)^2-cos(d*x+c)*sin(d*x+c)+2*I)*cos(d*x+c)^3*(a*(I*sin(d*
x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(e/cos(d*x+c))^(5/2)/e^5*a
```

maxima [A] time = 0.96, size = 59, normalized size = 0.73

$$\frac{\left(-i\,a\cos\left(\frac{5}{2}\,dx+\frac{5}{2}\,c\right)-5i\,a\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+a\sin\left(\frac{5}{2}\,dx+\frac{5}{2}\,c\right)+5\,a\sin\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right)\sqrt{a}}{5\,de^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(3/2)/(e*sec(d*x+c))^(5/2),x, algorithm="maxim
a")
```

```
[Out] 1/5*(-I*a*cos(5/2*d*x + 5/2*c) - 5*I*a*cos(1/2*d*x + 1/2*c) + a*sin(5/2*d*x
 + 5/2*c) + 5*a*sin(1/2*d*x + 1/2*c))*sqrt(a)/(d*e^(5/2))
```

mupad [B] time = 4.71, size = 102, normalized size = 1.26

$$-\frac{a\sqrt{\frac{e}{\cos(c+d\,x)}}\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}\,(-\sin(c+d\,x)-\sin(3\,c+3\,d\,x)+\cos(c+d\,x)\,11\mathrm{i}+\cos(3\,c+3}{10\,d\,e^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(3/2)/(e/cos(c + d*x))^(5/2),x)
```

```
[Out] -(a*(e/cos(c + d*x))^(1/2)*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1)
)/(cos(2*c + 2*d*x) + 1))^(1/2)*(cos(c + d*x)*11i - sin(c + d*x) + cos(3*c
+ 3*d*x)*1i - sin(3*c + 3*d*x)))/(10*d*e^3)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**(3/2)/(e*sec(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.406 $\int \frac{(a+ia\tan(c+dx))^{3/2}}{(e\sec(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=125

$$\frac{16ia^2\sqrt{e\sec(c+dx)}}{21de^4\sqrt{a+ia\tan(c+dx)}}-\frac{8ia\sqrt{a+ia\tan(c+dx)}}{21de^2(e\sec(c+dx))^{3/2}}-\frac{2i(a+ia\tan(c+dx))^{3/2}}{7d(e\sec(c+dx))^{7/2}}$$

```
[Out] 16/21*I*a^2*(e*sec(d*x+c))^(1/2)/d/e^4/(a+I*a*tan(d*x+c))^(1/2)-8/21*I*a*(a
+I*a*tan(d*x+c))^(1/2)/d/e^2/(e*sec(d*x+c))^(3/2)-2/7*I*(a+I*a*tan(d*x+c))^
(3/2)/d/(e*sec(d*x+c))^(7/2)
```

Rubi [A] time = 0.23, antiderivative size = 125, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$, Rules used = {3497, 3488}

$$\frac{16ia^2\sqrt{e\sec(c+dx)}}{21de^4\sqrt{a+ia\tan(c+dx)}}-\frac{8ia\sqrt{a+ia\tan(c+dx)}}{21de^2(e\sec(c+dx))^{3/2}}-\frac{2i(a+ia\tan(c+dx))^{3/2}}{7d(e\sec(c+dx))^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^(3/2)/(e*Sec[c + d*x])^(7/2),x]
```

```
[Out] (((16*I)/21)*a^2*Sqrt[e*Sec[c + d*x]])/(d*e^4*Sqrt[a + I*a*Tan[c + d*x]]) -
 (((8*I)/21)*a*Sqrt[a + I*a*Tan[c + d*x]])/(d*e^2*(e*Sec[c + d*x])^(3/2)) -
 (((2*I)/7)*(a + I*a*Tan[c + d*x])^(3/2))/(d*(e*Sec[c + d*x])^(7/2))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rubi steps

$$\begin{aligned}\int \frac{(a+ia\tan(c+dx))^{3/2}}{(e\sec(c+dx))^{7/2}}\,dx &= -\frac{2i(a+ia\tan(c+dx))^{3/2}}{7d(e\sec(c+dx))^{7/2}}+\frac{(4a)\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\sec(c+dx))^{3/2}}\,dx}{7e^2}\\ &= -\frac{8ia\sqrt{a+ia\tan(c+dx)}}{21de^2(e\sec(c+dx))^{3/2}}-\frac{2i(a+ia\tan(c+dx))^{3/2}}{7d(e\sec(c+dx))^{7/2}}+\frac{\left(8a^2\right)\int \frac{\sqrt{e\sec(c+dx)}}{\sqrt{a+ia\tan(c+dx)}}\,dx}{21e^4}\\ &= \frac{16ia^2\sqrt{e\sec(c+dx)}}{21de^4\sqrt{a+ia\tan(c+dx)}}-\frac{8ia\sqrt{a+ia\tan(c+dx)}}{21de^2(e\sec(c+dx))^{3/2}}-\frac{2i(a+ia\tan(c+dx))^{3/2}}{7d(e\sec(c+dx))^{7/2}}\end{aligned}$$

Mathematica [A] time = 0.46, size = 98, normalized size = 0.78

$$\frac{a(\cos(dx)-i\sin(dx))\sqrt{a+ia\tan(c+dx)}\,(12\sin(2(c+dx))+9i\cos(2(c+dx))-7i)(\cos(c+2dx)+i\sin(c+2dx$$
$$21de^3\sqrt{e\sec(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^(3/2)/(e*Sec[c + d*x])^(7/2),x]
```

```
[Out] (a*(Cos[d*x] - I*Sin[d*x])*(-7*I + (9*I)*Cos[2*(c + d*x)] + 12*Sin[2*(c + d
*x)])*(Cos[c + 2*d*x] + I*Sin[c + 2*d*x])*Sqrt[a + I*a*Tan[c + d*x]])/(21*d
*e^3*Sqrt[e*Sec[c + d*x]])
```

fricas [A] time = 0.56, size = 91, normalized size = 0.73

$$\frac{\left(-3 i a e^{(6 i dx+6 i c)}-17 i a e^{(4 i dx+4 i c)}+7 i a e^{(2 i dx+2 i c)}+21 i a\right)\sqrt{\frac{a}{e^{(2 i dx+2 i c)}+1}}\sqrt{\frac{e}{e^{(2 i dx+2 i c)}+1}}e^{\left(-\frac{1}{2} i dx-\frac{1}{2} i c\right)}}{42 de^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(3/2)/(e*sec(d*x+c))^(7/2),x, algorithm="frica
s")
```

```
[Out] 1/42*(-3*I*a*e^(6*I*d*x + 6*I*c) - 17*I*a*e^(4*I*d*x + 4*I*c) + 7*I*a*e^(2*
I*d*x + 2*I*c) + 21*I*a)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d
*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(d*e^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(i a \tan (dx+c)+a)^{\frac{3}{2}}}{(e \sec (dx+c))^{\frac{7}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(3/2)/(e*sec(d*x+c))^(7/2),x, algorithm="giac"
)
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(3/2)/(e*sec(d*x + c))^(7/2), x)
```

maple [A] time = 1.28, size = 103, normalized size = 0.82

$$-\frac{2\left(3 i \left(\cos^3 (dx+c)\right)-3\left(\cos^2 (dx+c)\right)\sin (dx+c)-4 i \cos (dx+c)-8 \sin (dx+c)\right)\sqrt{\frac{a(i \sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}}{21 d\, e^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^(3/2)/(e*sec(d*x+c))^(7/2),x)
```

```
[Out] -2/21/d*(3*I*cos(d*x+c)^3-3*cos(d*x+c)^2*sin(d*x+c)-4*I*cos(d*x+c)-8*sin(d*
x+c))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(e/cos(d*x+c))^(7/2)*c
os(d*x+c)^4/e^7*a
```

maxima [A] time = 1.07, size = 84, normalized size = 0.67

$$\frac{\left(-3 i a \cos\left(\frac{7}{2} dx+\frac{7}{2} c\right)-14 i a \cos\left(\frac{3}{2} dx+\frac{3}{2} c\right)+21 i a \cos\left(\frac{1}{2} dx+\frac{1}{2} c\right)+3 a \sin\left(\frac{7}{2} dx+\frac{7}{2} c\right)+14 a \sin\left(\frac{3}{2} dx+\right.\right.}{42 de^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(3/2)/(e*sec(d*x+c))^(7/2),x, algorithm="maxim
a")
```

```
[Out] 1/42*(-3*I*a*cos(7/2*d*x + 7/2*c) - 14*I*a*cos(3/2*d*x + 3/2*c) + 21*I*a*co
s(1/2*d*x + 1/2*c) + 3*a*sin(7/2*d*x + 7/2*c) + 14*a*sin(3/2*d*x + 3/2*c) +
 21*a*sin(1/2*d*x + 1/2*c))*sqrt(a)/(d*e^(7/2))
```

mupad [B] time = 4.92, size = 110, normalized size = 0.88

$$\frac{a\sqrt{\frac{e}{\cos(c+d\,x)}}\,\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}\,\left(\cos\left(2\,c+2\,d\,x\right)\,4\mathrm{i}-\cos\left(4\,c+4\,d\,x\right)\,3\mathrm{i}+38\,\sin\left(2\,c+2\,d\,x\right)+3\,\mathrm{s}\right.}{84\,d\,e^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(3/2)/(e/cos(c + d*x))^(7/2),x)
```

```
[Out] (a*(e/cos(c + d*x))^(1/2)*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))
/(cos(2*c + 2*d*x) + 1))^(1/2)*(cos(2*c + 2*d*x)*4i - cos(4*c + 4*d*x)*3i +
 38*sin(2*c + 2*d*x) + 3*sin(4*c + 4*d*x) + 7i))/(84*d*e^4)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**(3/2)/(e*sec(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.407 $\int \frac{(a+ia\tan(c+dx))^{3/2}}{(e\sec(c+dx))^{9/2}}\,dx$

Optimal. Leaf size=167

$$\frac{16ia^2}{45de^4\sqrt{a+ia\tan(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{32ia\sqrt{a+ia\tan(c+dx)}}{45de^4\sqrt{e\sec(c+dx)}}-\frac{4ia\sqrt{a+ia\tan(c+dx)}}{15de^2(e\sec(c+dx))^{5/2}}-\frac{2i(a+ia\tan(c\cdots}{9d(e\sec(c+\cdots}$$

```
[Out] 16/45*I*a^2/d/e^4/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)-4/15*I*a*(a
+I*a*tan(d*x+c))^(1/2)/d/e^2/(e*sec(d*x+c))^(5/2)-32/45*I*a*(a+I*a*tan(d*x+
c))^(1/2)/d/e^4/(e*sec(d*x+c))^(1/2)-2/9*I*(a+I*a*tan(d*x+c))^(3/2)/d/(e*se
c(d*x+c))^(9/2)
```

Rubi [A] time = 0.29, antiderivative size = 167, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {3497, 3502, 3488}

$$\frac{16ia^2}{45de^4\sqrt{a+ia\tan(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{32ia\sqrt{a+ia\tan(c+dx)}}{45de^4\sqrt{e\sec(c+dx)}}-\frac{4ia\sqrt{a+ia\tan(c+dx)}}{15de^2(e\sec(c+dx))^{5/2}}-\frac{2i(a+ia\tan(c\cdots}{9d(e\sec(c+\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^(3/2)/(e*Sec[c + d*x])^(9/2),x]
```

```
[Out] (((16*I)/45)*a^2)/(d*e^4*Sqrt[e*Sec[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) -
 (((4*I)/15)*a*Sqrt[a + I*a*Tan[c + d*x]])/(d*e^2*(e*Sec[c + d*x])^(5/2)) -
 (((32*I)/45)*a*Sqrt[a + I*a*Tan[c + d*x]])/(d*e^4*Sqrt[e*Sec[c + d*x]]) -
(((2*I)/9)*(a + I*a*Tan[c + d*x])^(3/2))/(d*(e*Sec[c + d*x])^(9/2))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^{3/2}}{(e\sec(c+dx))^{9/2}}\,dx = -\frac{2i(a+ia\tan(c+dx))^{3/2}}{9d(e\sec(c+dx))^{9/2}} + \frac{(2a)\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\sec(c+dx))^{5/2}}\,dx}{3e^2}$$

$$= -\frac{4ia\sqrt{a+ia\tan(c+dx)}}{15de^2(e\sec(c+dx))^{5/2}} - \frac{2i(a+ia\tan(c+dx))^{3/2}}{9d(e\sec(c+dx))^{9/2}} + \frac{(8a^2)\int \frac{1}{\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan}}}{15e^4}$$

$$= \frac{16ia^2}{45de^4\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}} - \frac{4ia\sqrt{a+ia\tan(c+dx)}}{15de^2(e\sec(c+dx))^{5/2}} - \frac{2i(a+ia\tan}{9d(e\sec(}$$

$$= \frac{16ia^2}{45de^4\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}} - \frac{4ia\sqrt{a+ia\tan(c+dx)}}{15de^2(e\sec(c+dx))^{5/2}} - \frac{32ia\sqrt{a+i}}{45de^4\sqrt{e}}$$

Mathematica [A] time = 0.59, size = 113, normalized size = 0.68

$$\frac{a(\cos(dx)-i\sin(dx))\sqrt{a+ia\tan(c+dx)}\,(-54\sin(c+dx)+10\sin(3(c+dx))-81i\cos(c+dx)+5i\cos(3(c+dx}{90de^4\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^(3/2)/(e*Sec[c + d*x])^(9/2),x]
```

```
[Out] (a*(Cos[d*x] - I*Sin[d*x])*((-81*I)*Cos[c + d*x] + (5*I)*Cos[3*(c + d*x)] -
 54*Sin[c + d*x] + 10*Sin[3*(c + d*x)])*(Cos[c + 2*d*x] + I*Sin[c + 2*d*x])
*Sqrt[a + I*a*Tan[c + d*x]])/(90*d*e^4*Sqrt[e*Sec[c + d*x]])
```

fricas [A] time = 1.02, size = 103, normalized size = 0.62

$$\frac{\left(-5i\,ae^{(8i\,dx+8i\,c)}-32i\,ae^{(6i\,dx+6i\,c)}-162i\,ae^{(4i\,dx+4i\,c)}-120i\,ae^{(2i\,dx+2i\,c)}+15i\,a\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{3}{2}i\,dx-\frac{3}{2}i}}{180\,de^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(3/2)/(e*sec(d*x+c))^(9/2),x, algorithm="frica
s")
```

```
[Out] 1/180*(-5*I*a*e^(8*I*d*x + 8*I*c) - 32*I*a*e^(6*I*d*x + 6*I*c) - 162*I*a*e^
(4*I*d*x + 4*I*c) - 120*I*a*e^(2*I*d*x + 2*I*c) + 15*I*a)*sqrt(a/(e^(2*I*d*
x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(-3/2*I*d*x - 3/2*I*c)
/(d*e^5)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(i\,a\tan(dx+c)+a)^{\frac{3}{2}}}{(e\sec(dx+c))^{\frac{9}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(3/2)/(e*sec(d*x+c))^(9/2),x, algorithm="giac"
)
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(3/2)/(e*sec(d*x + c))^(9/2), x)
```

maple [A] time = 1.33, size = 113, normalized size = 0.68

$$-\frac{2\left(5i\left(\cos^4(dx+c)\right)-5\left(\cos^3(dx+c)\right)\sin(dx+c)-2i\left(\cos^2(dx+c)\right)-8\cos(dx+c)\sin(dx+c)+16i\right)\sqrt{\frac{a(i}{}}}{45d\,e^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^(3/2)/(e*sec(d*x+c))^(9/2),x)
```

```
[Out] -2/45/d*(5*I*cos(d*x+c)^4-5*cos(d*x+c)^3*sin(d*x+c)-2*I*cos(d*x+c)^2-8*cos(
d*x+c)*sin(d*x+c)+16*I)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(e/c
os(d*x+c))^(9/2)*cos(d*x+c)^5/e^9*a
```

maxima [A] time = 1.38, size = 160, normalized size = 0.96

$$\frac{\left(-5i\,a\cos\left(\frac{9}{2}\,dx+\frac{9}{2}\,c\right)+15i\,a\cos\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right)-27i\,a\cos\left(\frac{5}{3}\,\arctan\left(\sin\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right),\cos\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right)\right)\right)-13\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(3/2)/(e*sec(d*x+c))^(9/2),x, algorithm="maxim
a")
```

```
[Out] 1/180*(-5*I*a*cos(9/2*d*x + 9/2*c) + 15*I*a*cos(3/2*d*x + 3/2*c) - 27*I*a*c
os(5/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 135*I*a*cos(1
/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 5*a*sin(9/2*d*x +
 9/2*c) + 15*a*sin(3/2*d*x + 3/2*c) + 27*a*sin(5/3*arctan2(sin(3/2*d*x + 3/
2*c), cos(3/2*d*x + 3/2*c))) + 135*a*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c),
cos(3/2*d*x + 3/2*c))))*sqrt(a)/(d*e^(9/2))
```

mupad [B] time = 5.58, size = 125, normalized size = 0.75

$$-\frac{a\,\sqrt{\frac{e}{\cos(c+d\,x)}}\,\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1i)}{\cos(2\,c+2\,d\,x)+1}}\,\left(-42\,\sin\left(c+d\,x\right)-47\,\sin\left(3\,c+3\,d\,x\right)-5\,\sin\left(5\,c+5\,d\,x\right)+c\cdots\right)}{360\,d\,e^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(3/2)/(e/cos(c + d*x))^(9/2),x)
```

```
[Out] -(a*(e/cos(c + d*x))^(1/2)*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1)
)/(cos(2*c + 2*d*x) + 1))^(1/2)*(cos(c + d*x)*282i - 42*sin(c + d*x) + cos(
3*c + 3*d*x)*17i + cos(5*c + 5*d*x)*5i - 47*sin(3*c + 3*d*x) - 5*sin(5*c +
5*d*x)))/(360*d*e^5)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**(3/2)/(e*sec(d*x+c))**(9/2),x)
```

```
[Out] Timed out
```

3.408 $\int (e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^{5/2}\,dx$

Optimal. Leaf size=612

$$-\frac{15ia^{7/2}e^{3/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{8\sqrt{2}d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}+\frac{15ia^{7/2}e^{3/2}\sec(c+dx)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{8\sqrt{2}d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}+\ldots$$

```
[Out] 15/8*I*a^3*(e*sec(d*x+c))^(3/2)/d/(a+I*a*tan(d*x+c))^(1/2)-15/16*I*a^(7/2)*
e^(3/2)*arctan(1-2^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*sec(d*
x+c))^(1/2))*sec(d*x+c)/d*2^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c
))^(1/2)+15/16*I*a^(7/2)*e^(3/2)*arctan(1+2^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c)
)^(1/2)/a^(1/2)/(e*sec(d*x+c))^(1/2))*sec(d*x+c)/d*2^(1/2)/(a-I*a*tan(d*x+c
))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)+15/32*I*a^(7/2)*e^(3/2)*ln(a-2^(1/2)*a^(1
/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2)+cos(d*x+c)*(a-I*a
*tan(d*x+c)))*sec(d*x+c)/d*2^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+
c))^(1/2)-15/32*I*a^(7/2)*e^(3/2)*ln(a+2^(1/2)*a^(1/2)*e^(1/2)*(a-I*a*tan(d
*x+c))^(1/2)/(e*sec(d*x+c))^(1/2)+cos(d*x+c)*(a-I*a*tan(d*x+c)))*sec(d*x+c)
/d*2^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)+3/4*I*a^2*(e*s
ec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^(1/2)/d+1/3*I*a*(e*sec(d*x+c))^(3/2)*(a
+I*a*tan(d*x+c))^(3/2)/d
```

Rubi [A] time = 0.69, antiderivative size = 612, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 9, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.300$, Rules used = {3498, 3499, 3495, 297, 1162, 617, 204, 1165, 628}

$$-\frac{15ia^{7/2}e^{3/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{8\sqrt{2}d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}+\frac{15ia^{7/2}e^{3/2}\sec(c+dx)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{8\sqrt{2}d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}+\ldots$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((15*I)/8)*a^3*(e*Sec[c + d*x])^(3/2))/(d*Sqrt[a + I*a*Tan[c + d*x]]) - ((
(15*I)/8)*a^(7/2)*e^(3/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e]*Sqrt[a - I*a*Tan[c +
d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])]*Sec[c + d*x])/(Sqrt[2]*d*Sqrt[a - I*
a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) + (((15*I)/8)*a^(7/2)*e^(3/2)*A
rcTan[1 + (Sqrt[2]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])/(Sqrt[a]*Sqrt[e*Sec[
c + d*x]])]*Sec[c + d*x])/(Sqrt[2]*d*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*
a*Tan[c + d*x]]) + (((15*I)/16)*a^(7/2)*e^(3/2)*Log[a - (Sqrt[2]*Sqrt[a]*Sq
rt[e]*Sqrt[a - I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a -
I*a*Tan[c + d*x])]*Sec[c + d*x])/(Sqrt[2]*d*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt
[a + I*a*Tan[c + d*x]]) - (((15*I)/16)*a^(7/2)*e^(3/2)*Log[a + (Sqrt[2]*Sqr
t[a]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x
]*(a - I*a*Tan[c + d*x])]*Sec[c + d*x])/(Sqrt[2]*d*Sqrt[a - I*a*Tan[c + d*x
]]*Sqrt[a + I*a*Tan[c + d*x]]) + (((3*I)/4)*a^2*(e*Sec[c + d*x])^(3/2)*Sqrt
[a + I*a*Tan[c + d*x]])/d + ((I/3)*a*(e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c
+ d*x])^(3/2))/d
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
```

```
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3495

```
Int[Sqrt[(d_.)*sec[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[(-4*b*d^2)/f, Subst[Int[x^2/(a^2 + d^2*x^4), x],
 x, Sqrt[a + b*Tan[e + f*x]]/Sqrt[d*Sec[e + f*x]]], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3498

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m}, x] && EqQ[a^2 + b^2, 0] && GtQ[n, 0] && NeQ[m + n - 1, 0] && IntegersQ[
2*m, 2*n]
```

Rule 3499

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(3/2)/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_
.)*(x_)]], x_Symbol] :> Dist[(d*Sec[e + f*x])/(Sqrt[a - b*Tan[e + f*x]]*Sqr
t[a + b*Tan[e + f*x]]), Int[Sqrt[d*Sec[e + f*x]]*Sqrt[a - b*Tan[e + f*x]],
x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^{5/2}\,dx = \frac{ia(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^{3/2}}{3d} + \frac{1}{2}(3a)\int (e\sec(c+dx)$$

$$= \frac{3ia^2(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}}{4d} + \frac{ia(e\sec(c+dx))^{3/2}(a}{3d}$$

$$= \frac{15ia^3(e\sec(c+dx))^{3/2}}{8d\sqrt{a+ia\tan(c+dx)}} + \frac{3ia^2(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx}}{4d}$$

$$= \frac{15ia^3(e\sec(c+dx))^{3/2}}{8d\sqrt{a+ia\tan(c+dx)}} + \frac{3ia^2(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx}}{4d}$$

$$= \frac{15ia^3(e\sec(c+dx))^{3/2}}{8d\sqrt{a+ia\tan(c+dx)}} + \frac{3ia^2(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx}}{4d}$$

$$= \frac{15ia^3(e\sec(c+dx))^{3/2}}{8d\sqrt{a+ia\tan(c+dx)}} + \frac{3ia^2(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx}}{4d}$$

$$= \frac{15ia^3(e\sec(c+dx))^{3/2}}{8d\sqrt{a+ia\tan(c+dx)}} + \frac{3ia^2(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx}}{4d}$$

$$= \frac{15ia^3(e\sec(c+dx))^{3/2}}{8d\sqrt{a+ia\tan(c+dx)}} + \frac{15ia^{7/2}e^{3/2}\log\left(a-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a-ia\tan(c+dx}}{\sqrt{e\sec(c+dx)}}\right.}{16\sqrt{2}\,d\sqrt{a-ia\tan(}}$$

$$= \frac{15ia^3(e\sec(c+dx))^{3/2}}{8d\sqrt{a+ia\tan(c+dx)}} - \frac{15ia^{7/2}e^{3/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right.}{8\sqrt{2}\,d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan}}$$

Mathematica [B] time = 56.56, size = 11411, normalized size = 18.65

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] Result too large to show
```

fricas [A] time = 0.55, size = 635, normalized size = 1.04

$$\left(113i\,a^2ee^{(4i\,dx+4i\,c)}+126i\,a^2ee^{(2i\,dx+2i\,c)}+45i\,a^2e\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+6\sqrt{\frac{225i\,a^5e^3}{64\,d^2}}\left(de^{(4i\,dx+4i\,c)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="frica
s")
```

```
[Out] 1/12*((113*I*a^2*e*e^(4*I*d*x + 4*I*c) + 126*I*a^2*e*e^(2*I*d*x + 2*I*c) +
45*I*a^2*e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) +
 1))*e^(1/2*I*d*x + 1/2*I*c) + 6*sqrt(225/64*I*a^5*e^3/d^2)*(d*e^(4*I*d*x +
 4*I*c) + 2*d*e^(2*I*d*x + 2*I*c) + d)*log(1/15*(30*(a^2*e*e^(2*I*d*x + 2*I
*c) + a^2*e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c)
+ 1))*e^(1/2*I*d*x + 1/2*I*c) + 16*I*sqrt(225/64*I*a^5*e^3/d^2)*d)/(a^2*e))
 - 6*sqrt(225/64*I*a^5*e^3/d^2)*(d*e^(4*I*d*x + 4*I*c) + 2*d*e^(2*I*d*x + 2
```

```
*I*c) + d)*log(1/15*(30*(a^2*e*e^(2*I*d*x + 2*I*c) + a^2*e)*sqrt(a/(e^(2*I*
d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c
) - 16*I*sqrt(225/64*I*a^5*e^3/d^2)*d)/(a^2*e)) + 6*sqrt(-225/64*I*a^5*e^3/
d^2)*(d*e^(4*I*d*x + 4*I*c) + 2*d*e^(2*I*d*x + 2*I*c) + d)*log(1/15*(30*(a^
2*e*e^(2*I*d*x + 2*I*c) + a^2*e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(
e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 16*I*sqrt(-225/64*I*a^5
*e^3/d^2)*d)/(a^2*e)) - 6*sqrt(-225/64*I*a^5*e^3/d^2)*(d*e^(4*I*d*x + 4*I*c
) + 2*d*e^(2*I*d*x + 2*I*c) + d)*log(1/15*(30*(a^2*e*e^(2*I*d*x + 2*I*c) +
a^2*e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*
e^(1/2*I*d*x + 1/2*I*c) - 16*I*sqrt(-225/64*I*a^5*e^3/d^2)*d)/(a^2*e)))/(d*
e^(4*I*d*x + 4*I*c) + 2*d*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{\frac{3}{2}} (ia\tan(dx+c)+a)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac"
)
```

```
[Out] integrate((e*sec(d*x + c))^(3/2)*(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [A] time = 1.18, size = 424, normalized size = 0.69

$$\frac{(-1+\cos(dx+c))^2\left(45i\left(\cos^3(dx+c)\right)\operatorname{arctanh}\left(\frac{\sqrt{\frac{1}{1+\cos(dx+c)}}\,(\cos(dx+c)+1+\sin(dx+c))}{2}\right)-45i\left(\cos^3(dx+c)\right)\operatorname{arctan}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 1/48/d*(-1+cos(d*x+c))^2*(45*I*cos(d*x+c)^3*arctanh(1/2*(1/(1+cos(d*x+c)))^
(1/2)*(cos(d*x+c)+1+sin(d*x+c)))-45*I*cos(d*x+c)^3*arctanh(1/2*(1/(1+cos(d*
x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))+90*I*cos(d*x+c)^2*sin(d*x+c)*(1/(1+
cos(d*x+c)))^(1/2)-68*I*cos(d*x+c)*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)-90*c
os(d*x+c)^3*(1/(1+cos(d*x+c)))^(1/2)+45*cos(d*x+c)^3*arctanh(1/2*(1/(1+cos(
d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+45*cos(d*x+c)^3*arctanh(1/2*(1/(1
+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))-16*I*sin(d*x+c)*(1/(1+cos(d*
x+c)))^(1/2)-158*cos(d*x+c)^2*(1/(1+cos(d*x+c)))^(1/2)-52*cos(d*x+c)*(1/(1+
cos(d*x+c)))^(1/2)+16*(1/(1+cos(d*x+c)))^(1/2))*(a*(I*sin(d*x+c)+cos(d*x+c)
)/cos(d*x+c))^(1/2)*(e/cos(d*x+c))^(3/2)/(I*sin(d*x+c)+cos(d*x+c)-1)/cos(d*
x+c)/sin(d*x+c)^3/(1/(1+cos(d*x+c)))^(3/2)*a^2
```

maxima [B] time = 1.50, size = 3018, normalized size = 4.93

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxim
a")
```

```
[Out] (347136*a^2*e*cos(9/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 387072
*a^2*e*cos(5/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 138240*a^2*e*
cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 347136*I*a^2*e*sin(9
/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 387072*I*a^2*e*sin(5/4*ar
ctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 138240*I*a^2*e*sin(1/4*arctan2
```

(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - (17280*sqrt(2)*a^2*e*cos(6*d*x + 6*
c) + 51840*sqrt(2)*a^2*e*cos(4*d*x + 4*c) + 51840*sqrt(2)*a^2*e*cos(2*d*x +
 2*c) + 17280*I*sqrt(2)*a^2*e*sin(6*d*x + 6*c) + 51840*I*sqrt(2)*a^2*e*sin(
4*d*x + 4*c) + 51840*I*sqrt(2)*a^2*e*sin(2*d*x + 2*c) + 17280*sqrt(2)*a^2*e
)*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1,
 sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (17280
*sqrt(2)*a^2*e*cos(6*d*x + 6*c) + 51840*sqrt(2)*a^2*e*cos(4*d*x + 4*c) + 51
840*sqrt(2)*a^2*e*cos(2*d*x + 2*c) + 17280*I*sqrt(2)*a^2*e*sin(6*d*x + 6*c)
 + 51840*I*sqrt(2)*a^2*e*sin(4*d*x + 4*c) + 51840*I*sqrt(2)*a^2*e*sin(2*d*x
 + 2*c) + 17280*sqrt(2)*a^2*e)*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x +
2*c), cos(2*d*x + 2*c))) + 1, -sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c))) + 1) - (17280*sqrt(2)*a^2*e*cos(6*d*x + 6*c) + 51840*sqrt(
2)*a^2*e*cos(4*d*x + 4*c) + 51840*sqrt(2)*a^2*e*cos(2*d*x + 2*c) + 17280*I*
sqrt(2)*a^2*e*sin(6*d*x + 6*c) + 51840*I*sqrt(2)*a^2*e*sin(4*d*x + 4*c) + 5
1840*I*sqrt(2)*a^2*e*sin(2*d*x + 2*c) + 17280*sqrt(2)*a^2*e)*arctan2(sqrt(2
)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 1, sqrt(2)*sin(1/4
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (17280*sqrt(2)*a^2*e*c
os(6*d*x + 6*c) + 51840*sqrt(2)*a^2*e*cos(4*d*x + 4*c) + 51840*sqrt(2)*a^2*
e*cos(2*d*x + 2*c) + 17280*I*sqrt(2)*a^2*e*sin(6*d*x + 6*c) + 51840*I*sqrt(
2)*a^2*e*sin(4*d*x + 4*c) + 51840*I*sqrt(2)*a^2*e*sin(2*d*x + 2*c) + 17280*
sqrt(2)*a^2*e)*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c))) - 1, -sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
 + 1) - (17280*I*sqrt(2)*a^2*e*cos(6*d*x + 6*c) + 51840*I*sqrt(2)*a^2*e*cos
(4*d*x + 4*c) + 51840*I*sqrt(2)*a^2*e*cos(2*d*x + 2*c) - 17280*sqrt(2)*a^2*
e*sin(6*d*x + 6*c) - 51840*sqrt(2)*a^2*e*sin(4*d*x + 4*c) - 51840*sqrt(2)*a
^2*e*sin(2*d*x + 2*c) + 17280*I*sqrt(2)*a^2*e)*arctan2(sqrt(2)*sin(1/4*arct
an2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c)
, cos(2*d*x + 2*c))), sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
 2*c))) + cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (-172
80*I*sqrt(2)*a^2*e*cos(6*d*x + 6*c) - 51840*I*sqrt(2)*a^2*e*cos(4*d*x + 4*c
) - 51840*I*sqrt(2)*a^2*e*cos(2*d*x + 2*c) + 17280*sqrt(2)*a^2*e*sin(6*d*x
+ 6*c) + 51840*sqrt(2)*a^2*e*sin(4*d*x + 4*c) + 51840*sqrt(2)*a^2*e*sin(2*d
*x + 2*c) - 17280*I*sqrt(2)*a^2*e)*arctan2(-sqrt(2)*sin(1/4*arctan2(sin(2*d
*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c))), -sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) +
cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (8640*sqrt(2)*a
^2*e*cos(6*d*x + 6*c) + 25920*sqrt(2)*a^2*e*cos(4*d*x + 4*c) + 25920*sqrt(2
)*a^2*e*cos(2*d*x + 2*c) + 8640*I*sqrt(2)*a^2*e*sin(6*d*x + 6*c) + 25920*I*
sqrt(2)*a^2*e*sin(4*d*x + 4*c) + 25920*I*sqrt(2)*a^2*e*sin(2*d*x + 2*c) + 8
640*sqrt(2)*a^2*e)*log(2*sqrt(2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*
x + 2*c)))*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2*(sqrt(2
)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1)*cos(1/2*arctan2
(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x + 2*c), c
os(2*d*x + 2*c)))^2 + 2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))
)^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*ar
ctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(si
n(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (8640*sqrt(2)*a^2*e*cos(6*d*x + 6
*c) + 25920*sqrt(2)*a^2*e*cos(4*d*x + 4*c) + 25920*sqrt(2)*a^2*e*cos(2*d*x
+ 2*c) + 8640*I*sqrt(2)*a^2*e*sin(6*d*x + 6*c) + 25920*I*sqrt(2)*a^2*e*sin(
4*d*x + 4*c) + 25920*I*sqrt(2)*a^2*e*sin(2*d*x + 2*c) + 8640*sqrt(2)*a^2*e)
*log(-2*sqrt(2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/
4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 2*(sqrt(2)*cos(1/4*arctan2
(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 1)*cos(1/2*arctan2(sin(2*d*x + 2*c)
, cos(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
^2 + 2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), c
os(2*d*x + 2*c))) + 1) - (8640*I*sqrt(2)*a^2*e*cos(6*d*x + 6*c) + 25920*I*s
qrt(2)*a^2*e*cos(4*d*x + 4*c) + 25920*I*sqrt(2)*a^2*e*cos(2*d*x + 2*c) - 86

```
40*sqrt(2)*a^2*e*sin(6*d*x + 6*c) - 25920*sqrt(2)*a^2*e*sin(4*d*x + 4*c) -
25920*sqrt(2)*a^2*e*sin(2*d*x + 2*c) + 8640*I*sqrt(2)*a^2*e)*log(2*cos(1/4*
arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*
x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c)
, cos(2*d*x + 2*c))) + 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*
x + 2*c))) + 2) - (-8640*I*sqrt(2)*a^2*e*cos(6*d*x + 6*c) - 25920*I*sqrt(2)
*a^2*e*cos(4*d*x + 4*c) - 25920*I*sqrt(2)*a^2*e*cos(2*d*x + 2*c) + 8640*sqr
t(2)*a^2*e*sin(6*d*x + 6*c) + 25920*sqrt(2)*a^2*e*sin(4*d*x + 4*c) + 25920*
sqrt(2)*a^2*e*sin(2*d*x + 2*c) - 8640*I*sqrt(2)*a^2*e)*log(2*cos(1/4*arctan
2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*
c), cos(2*d*x + 2*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(
2*d*x + 2*c))) - 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*
c))) + 2) - (8640*I*sqrt(2)*a^2*e*cos(6*d*x + 6*c) + 25920*I*sqrt(2)*a^2*e*
cos(4*d*x + 4*c) + 25920*I*sqrt(2)*a^2*e*cos(2*d*x + 2*c) - 8640*sqrt(2)*a^
2*e*sin(6*d*x + 6*c) - 25920*sqrt(2)*a^2*e*sin(4*d*x + 4*c) - 25920*sqrt(2)
*a^2*e*sin(2*d*x + 2*c) + 8640*I*sqrt(2)*a^2*e)*log(2*cos(1/4*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
 2*c))) + 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) +
2) - (-8640*I*sqrt(2)*a^2*e*cos(6*d*x + 6*c) - 25920*I*sqrt(2)*a^2*e*cos(4*
d*x + 4*c) - 25920*I*sqrt(2)*a^2*e*cos(2*d*x + 2*c) + 8640*sqrt(2)*a^2*e*si
n(6*d*x + 6*c) + 25920*sqrt(2)*a^2*e*sin(4*d*x + 4*c) + 25920*sqrt(2)*a^2*e
*sin(2*d*x + 2*c) - 8640*I*sqrt(2)*a^2*e)*log(2*cos(1/4*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))
) - 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2))*sq
rt(a)*sqrt(e)/(d*(-36864*I*cos(6*d*x + 6*c) - 110592*I*cos(4*d*x + 4*c) - 1
10592*I*cos(2*d*x + 2*c) + 36864*sin(6*d*x + 6*c) + 110592*sin(4*d*x + 4*c)
 + 110592*sin(2*d*x + 2*c) - 36864*I))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \left(\frac{e}{\cos\left(c+d\,x\right)}\right)^{3/2}\,{\left(a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^(5/2),x)
[Out] int((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(3/2)*(a+I*a*tan(d*x+c))**(5/2),x)
[Out] Timed out
```

3.409 $\int \sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^{5/2}\,dx$

Optimal. Leaf size=411

$$\frac{21ia^{5/2}\sqrt{e}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{4\sqrt{2}d}-\frac{21ia^{5/2}\sqrt{e}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{4\sqrt{2}d}-\frac{21ia^{5/2}\sqrt{e}\log\left(-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{\ldots}}{\sqrt{e\sec\ldots}}\right.}{\ldots}$$

```
[Out] 21/8*I*a^(5/2)*arctan(1-2^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e
*sec(d*x+c))^(1/2))*e^(1/2)/d*2^(1/2)-21/8*I*a^(5/2)*arctan(1+2^(1/2)*e^(1/
2)*(a+I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*sec(d*x+c))^(1/2))*e^(1/2)/d*2^(1/2)
-21/16*I*a^(5/2)*ln(a-2^(1/2)*a^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/(e*s
ec(d*x+c))^(1/2)+cos(d*x+c)*(a+I*a*tan(d*x+c)))*e^(1/2)/d*2^(1/2)+21/16*I*a
^(5/2)*ln(a+2^(1/2)*a^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))
^(1/2)+cos(d*x+c)*(a+I*a*tan(d*x+c)))*e^(1/2)/d*2^(1/2)+7/4*I*a^2*(e*sec(d*
x+c))^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/d+1/2*I*a*(e*sec(d*x+c))^(1/2)*(a+I*a*
tan(d*x+c))^(3/2)/d
```

Rubi [A] time = 0.45, antiderivative size = 411, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {3498, 3495, 297, 1162, 617, 204, 1165, 628}

$$\frac{21ia^{5/2}\sqrt{e}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{4\sqrt{2}d}-\frac{21ia^{5/2}\sqrt{e}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{4\sqrt{2}d}+\frac{7ia^2\sqrt{a+ia\tan(c+dx)}\sqrt{\ldots}}{4d}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((21*I)/4)*a^(5/2)*Sqrt[e]*ArcTan[1 - (Sqrt[2]*Sqrt[e]*Sqrt[a + I*a*Tan[c
 + d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])])/(Sqrt[2]*d) - (((21*I)/4)*a^(5/2)
*Sqrt[e]*ArcTan[1 + (Sqrt[2]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]])/(Sqrt[a]*S
qrt[e*Sec[c + d*x]])])/(Sqrt[2]*d) - (((21*I)/8)*a^(5/2)*Sqrt[e]*Log[a - (S
qrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + C
os[c + d*x]*(a + I*a*Tan[c + d*x])])/(Sqrt[2]*d) + (((21*I)/8)*a^(5/2)*Sqrt
[e]*Log[a + (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]])/Sqrt[e*Sec
[c + d*x]] + Cos[c + d*x]*(a + I*a*Tan[c + d*x])])/(Sqrt[2]*d) + (((7*I)/4)
*a^2*Sqrt[e*Sec[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]])/d + ((I/2)*a*Sqrt[e*S
ec[c + d*x]]*(a + I*a*Tan[c + d*x])^(3/2))/d
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
```

```
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3495

```
Int[Sqrt[(d_.)*sec[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[(-4*b*d^2)/f, Subst[Int[x^2/(a^2 + d^2*x^4), x],
 x, Sqrt[a + b*Tan[e + f*x]]/Sqrt[d*Sec[e + f*x]]], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3498

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m}, x] && EqQ[a^2 + b^2, 0] && GtQ[n, 0] && NeQ[m + n - 1, 0] && IntegersQ[
2*m, 2*n]
```

Rubi steps

$$\int \sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^{5/2}\,dx = \frac{ia\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^{3/2}}{2d} + \frac{1}{4}(7a)\int \sqrt{e\sec(c+dx)}\,($$

$$= \frac{7ia^2\sqrt{e\sec(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}{4d} + \frac{ia\sqrt{e\sec(c+dx)}\,(a+ia\,t}{2d}$$

$$= \frac{7ia^2\sqrt{e\sec(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}{4d} + \frac{ia\sqrt{e\sec(c+dx)}\,(a+ia\,t}{2d}$$

$$= \frac{7ia^2\sqrt{e\sec(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}{4d} + \frac{ia\sqrt{e\sec(c+dx)}\,(a+ia\,t}{2d}$$

$$= \frac{7ia^2\sqrt{e\sec(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}{4d} + \frac{ia\sqrt{e\sec(c+dx)}\,(a+ia\,t}{2d}$$

$$= -\frac{21ia^{5/2}\sqrt{e}\,\log\left(a - \frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}} + \cos(c+dx)(a+ia\tan\right.}{8\sqrt{2}\,d}$$

$$= \frac{21ia^{5/2}\sqrt{e}\,\tan^{-1}\left(1 - \frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{4\sqrt{2}\,d} - \frac{21ia^{5/2}\sqrt{e}\,\tan^{-1}\left(1+\right.}{4\sqrt{2}}$$

Mathematica [A] time = 4.15, size = 387, normalized size = 0.94

$$-\frac{a^2(\cos(2dx)+i\sin(2dx))\sqrt{a+ia\tan(c+dx)}\,\sqrt{e\sec(c+dx)}\left(\sqrt{i\sin(2c)+\cos(2c)+1}\,\sqrt{-\tan\left(\frac{dx}{2}\right)+i}\,(2\tan(c\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] -1/4*(a^2*Sqrt[e*Sec[c + d*x]]*(Cos[2*d*x] + I*Sin[2*d*x])*Sqrt[a + I*a*Tan
[c + d*x]]*(21*ArcTanh[(Sqrt[1 - I*Cos[c] + Sin[c]]*Sqrt[I - Tan[(d*x)/2]])
/(Sqrt[-1 - I*Cos[c] - Sin[c]]*Sqrt[I + Tan[(d*x)/2]])]*Cos[c + d*x]*Sqrt[-
1 - I*Cos[c] - Sin[c]]*Sqrt[1 + I*Cos[c] - Sin[c]]*Sqrt[I + Tan[(d*x)/2]] -
 21*ArcTanh[(Sqrt[1 + I*Cos[c] - Sin[c]]*Sqrt[I - Tan[(d*x)/2]])/(Sqrt[-1 +
 I*Cos[c] + Sin[c]]*Sqrt[I + Tan[(d*x)/2]])]*Cos[c + d*x]*Sqrt[1 - I*Cos[c]
 + Sin[c]]*Sqrt[-1 + I*Cos[c] + Sin[c]]*Sqrt[I + Tan[(d*x)/2]] + Sqrt[1 + C
os[2*c] + I*Sin[2*c]]*Sqrt[I - Tan[(d*x)/2]]*(-9*I + 2*Tan[c + d*x])))/(d*S
qrt[1 + Cos[2*c] + I*Sin[2*c]]*(Cos[d*x] + I*Sin[d*x])^2*Sqrt[I - Tan[(d*x)
/2]])
```

fricas [A] time = 0.65, size = 525, normalized size = 1.28

$$\frac{\left(11i\,a^2e^{(3i\,dx+3i\,c)} + 7i\,a^2e^{(i\,dx+i\,c)}\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\,\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)} + \sqrt{\frac{441i\,a^5e}{16\,d^2}}\,\left(de^{(2i\,dx+2i\,c)}+d\right)\log\left(\frac{2\left(21\left(a^2e^{(2i\,d\right.\right.}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="frica
s")
```

```
[Out] 1/2*((11*I*a^2*e^(3*I*d*x + 3*I*c) + 7*I*a^2*e^(I*d*x + I*c))*sqrt(a/(e^(2*
I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I
*c) + sqrt(441/16*I*a^5*e/d^2)*(d*e^(2*I*d*x + 2*I*c) + d)*log(2/21*(21*(a^
2*e^(2*I*d*x + 2*I*c) + a^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2
*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 4*sqrt(441/16*I*a^5*e/d^2)*
d)/a^2) - sqrt(441/16*I*a^5*e/d^2)*(d*e^(2*I*d*x + 2*I*c) + d)*log(2/21*(21
*(a^2*e^(2*I*d*x + 2*I*c) + a^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(
e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) - 4*sqrt(441/16*I*a^5*e/d
^2)*d)/a^2) - sqrt(-441/16*I*a^5*e/d^2)*(d*e^(2*I*d*x + 2*I*c) + d)*log(2/2
1*(21*(a^2*e^(2*I*d*x + 2*I*c) + a^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqr
t(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 4*sqrt(-441/16*I*a
^5*e/d^2)*d)/a^2) + sqrt(-441/16*I*a^5*e/d^2)*(d*e^(2*I*d*x + 2*I*c) + d)*l
og(2/21*(21*(a^2*e^(2*I*d*x + 2*I*c) + a^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1
))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) - 4*sqrt(-441/
16*I*a^5*e/d^2)*d)/a^2))/(d*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{e \sec (dx + c)}\, (i\, a \tan (dx + c) + a)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac"
)
```

```
[Out] integrate(sqrt(e*sec(d*x + c))*(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [A] time = 1.28, size = 371, normalized size = 0.90

$$\frac{(-1 + \cos (dx + c)) \left(21 i \left(\cos^2 (dx + c)\right) \operatorname{arctanh}\left(\frac{\sqrt{\frac{1}{1+\cos(dx+c)}}\, (\cos(dx+c)+1-\sin(dx+c))}{2}\right) - 21 i \left(\cos^2 (dx + c)\right) \operatorname{arctanl}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 1/8/d*(-1+cos(d*x+c))*(21*I*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/
2)*(cos(d*x+c)+1-sin(d*x+c)))-21*I*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos(d*x+c
)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+22*I*cos(d*x+c)*sin(d*x+c)*(1/(1+cos(d
*x+c)))^(1/2)+4*I*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)+22*cos(d*x+c)^2*(1/(1
+cos(d*x+c)))^(1/2)+21*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(c
os(d*x+c)+1-sin(d*x+c)))+21*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/
2)*(cos(d*x+c)+1+sin(d*x+c)))+18*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)-4*(1/(
1+cos(d*x+c)))^(1/2))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(e/cos
(d*x+c))^(1/2)/(I*sin(d*x+c)+cos(d*x+c)-1)/cos(d*x+c)/sin(d*x+c)/(1/(1+cos(
d*x+c)))^(1/2)*a^2
```

maxima [B] time = 1.62, size = 2438, normalized size = 5.93

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxim
a")
```

```
[Out] (5632*a^2*cos(7/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 3584*a^2*c
os(3/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 5632*I*a^2*sin(7/4*ar
```

ctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 3584*I*a^2*sin(3/4*arctan2(sin
(2*d*x + 2*c), cos(2*d*x + 2*c))) - (1344*sqrt(2)*a^2*cos(4*d*x + 4*c) + 26
88*sqrt(2)*a^2*cos(2*d*x + 2*c) + 1344*I*sqrt(2)*a^2*sin(4*d*x + 4*c) + 268
8*I*sqrt(2)*a^2*sin(2*d*x + 2*c) + 1344*sqrt(2)*a^2)*arctan2(sqrt(2)*cos(1/
4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1, sqrt(2)*sin(1/4*arctan2
(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (1344*sqrt(2)*a^2*cos(4*d*x +
4*c) + 2688*sqrt(2)*a^2*cos(2*d*x + 2*c) + 1344*I*sqrt(2)*a^2*sin(4*d*x + 4
*c) + 2688*I*sqrt(2)*a^2*sin(2*d*x + 2*c) + 1344*sqrt(2)*a^2)*arctan2(sqrt(
2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1, -sqrt(2)*sin(1
/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (1344*sqrt(2)*a^2*co
s(4*d*x + 4*c) + 2688*sqrt(2)*a^2*cos(2*d*x + 2*c) + 1344*I*sqrt(2)*a^2*sin
(4*d*x + 4*c) + 2688*I*sqrt(2)*a^2*sin(2*d*x + 2*c) + 1344*sqrt(2)*a^2)*arc
tan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 1, sqrt
(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (1344*sqrt(
2)*a^2*cos(4*d*x + 4*c) + 2688*sqrt(2)*a^2*cos(2*d*x + 2*c) + 1344*I*sqrt(2
)*a^2*sin(4*d*x + 4*c) + 2688*I*sqrt(2)*a^2*sin(2*d*x + 2*c) + 1344*sqrt(2)
*a^2)*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
- 1, -sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (
1344*I*sqrt(2)*a^2*cos(4*d*x + 4*c) + 2688*I*sqrt(2)*a^2*cos(2*d*x + 2*c) -
 1344*sqrt(2)*a^2*sin(4*d*x + 4*c) - 2688*sqrt(2)*a^2*sin(2*d*x + 2*c) + 13
44*I*sqrt(2)*a^2)*arctan2(sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))), sqrt(2)
*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arctan2(sin
(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (-1344*I*sqrt(2)*a^2*cos(4*d*x + 4
*c) - 2688*I*sqrt(2)*a^2*cos(2*d*x + 2*c) + 1344*sqrt(2)*a^2*sin(4*d*x + 4*
c) + 2688*sqrt(2)*a^2*sin(2*d*x + 2*c) - 1344*I*sqrt(2)*a^2)*arctan2(-sqrt(
2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(s
in(2*d*x + 2*c), cos(2*d*x + 2*c))), -sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c
))) + 1) + (672*sqrt(2)*a^2*cos(4*d*x + 4*c) + 1344*sqrt(2)*a^2*cos(2*d*x +
 2*c) + 672*I*sqrt(2)*a^2*sin(4*d*x + 4*c) + 1344*I*sqrt(2)*a^2*sin(2*d*x +
 2*c) + 672*sqrt(2)*a^2)*log(2*sqrt(2)*sin(1/2*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c)))*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2*(
sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1)*cos(1/2*a
rctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c)))^2 + 2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(
1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt(2)*cos(1/4*arct
an2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (672*sqrt(2)*a^2*cos(4*d*x
+ 4*c) + 1344*sqrt(2)*a^2*cos(2*d*x + 2*c) + 672*I*sqrt(2)*a^2*sin(4*d*x +
4*c) + 1344*I*sqrt(2)*a^2*sin(2*d*x + 2*c) + 672*sqrt(2)*a^2)*log(-2*sqrt(2
)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/4*arctan2(sin(
2*d*x + 2*c), cos(2*d*x + 2*c))) - 2*(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c))) - 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
2*c))) + cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*cos(1/4
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x
 + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c
))) + 1) + (-672*I*sqrt(2)*a^2*cos(4*d*x + 4*c) - 1344*I*sqrt(2)*a^2*cos(2*
d*x + 2*c) + 672*sqrt(2)*a^2*sin(4*d*x + 4*c) + 1344*sqrt(2)*a^2*sin(2*d*x
+ 2*c) - 672*I*sqrt(2)*a^2)*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 +
2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2*sqrt(2)*
sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) + (672*I*sqrt(2)*
a^2*cos(4*d*x + 4*c) + 1344*I*sqrt(2)*a^2*cos(2*d*x + 2*c) - 672*sqrt(2)*a^
2*sin(4*d*x + 4*c) - 1344*sqrt(2)*a^2*sin(2*d*x + 2*c) + 672*I*sqrt(2)*a^2)
*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*a
rctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(s
in(2*d*x + 2*c), cos(2*d*x + 2*c))) - 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x +

```
 2*c), cos(2*d*x + 2*c))) + 2) + (-672*I*sqrt(2)*a^2*cos(4*d*x + 4*c) - 134
4*I*sqrt(2)*a^2*cos(2*d*x + 2*c) + 672*sqrt(2)*a^2*sin(4*d*x + 4*c) + 1344*
sqrt(2)*a^2*sin(2*d*x + 2*c) - 672*I*sqrt(2)*a^2)*log(2*cos(1/4*arctan2(sin
(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), c
os(2*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c))) + 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
+ 2) + (672*I*sqrt(2)*a^2*cos(4*d*x + 4*c) + 1344*I*sqrt(2)*a^2*cos(2*d*x +
 2*c) - 672*sqrt(2)*a^2*sin(4*d*x + 4*c) - 1344*sqrt(2)*a^2*sin(2*d*x + 2*c
) + 672*I*sqrt(2)*a^2)*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sqr
t(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 2*sqrt(2)*sin(1
/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2))*sqrt(a)*sqrt(e)/(d*(-
1024*I*cos(4*d*x + 4*c) - 2048*I*cos(2*d*x + 2*c) + 1024*sin(4*d*x + 4*c) +
 2048*sin(2*d*x + 2*c) - 1024*I))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \sqrt{\frac{e}{\cos\left(c+d\,x\right)}}\,{\left(a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^{5/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^(5/2),x)
[Out] int((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(1/2)*(a+I*a*tan(d*x+c))**(5/2),x)
[Out] Timed out
```

3.410 $\int \frac{(a+ia\tan(c+dx))^{5/2}}{\sqrt{e\sec(c+dx)}}\,dx$

Optimal. Leaf size=563

$$\frac{5ia^{7/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}d\sqrt{e}\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}-\frac{5ia^{7/2}\sec(c+dx)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}d\sqrt{e}\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}-\frac{5ia^{7/2}\sec(c$$

```
[Out] 5/2*I*a^(7/2)*arctan(1-2^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*
sec(d*x+c))^(1/2))*sec(d*x+c)/d*2^(1/2)/e^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a
+I*a*tan(d*x+c))^(1/2)-5/2*I*a^(7/2)*arctan(1+2^(1/2)*e^(1/2)*(a-I*a*tan(d*
x+c))^(1/2)/a^(1/2)/(e*sec(d*x+c))^(1/2))*sec(d*x+c)/d*2^(1/2)/e^(1/2)/(a-I
*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)-5/4*I*a^(7/2)*ln(a-2^(1/2)*a^
(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2)+cos(d*x+c)*(a-I
*a*tan(d*x+c)))*sec(d*x+c)/d*2^(1/2)/e^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*
a*tan(d*x+c))^(1/2)+5/4*I*a^(7/2)*ln(a+2^(1/2)*a^(1/2)*e^(1/2)*(a-I*a*tan(d
*x+c))^(1/2)/(e*sec(d*x+c))^(1/2)+cos(d*x+c)*(a-I*a*tan(d*x+c)))*sec(d*x+c)
/d*2^(1/2)/e^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)-10*I*a
^2*(a+I*a*tan(d*x+c))^(1/2)/d/(e*sec(d*x+c))^(1/2)+I*a*(a+I*a*tan(d*x+c))^(
3/2)/d/(e*sec(d*x+c))^(1/2)
```

Rubi [A] time = 0.58, antiderivative size = 563, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {3498, 3496, 3499, 3495, 297, 1162, 617, 204, 1165, 628}

$$\frac{5ia^{7/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}d\sqrt{e}\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}-\frac{5ia^{7/2}\sec(c+dx)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}d\sqrt{e}\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}-\frac{10ia^2\sqrt{a+i}}{d\sqrt{e\sec}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^(5/2)/Sqrt[e*Sec[c + d*x]],x]
```

```
[Out] ((5*I)*a^(7/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])/(Sqr
t[a]*Sqrt[e*Sec[c + d*x]])]*Sec[c + d*x])/(Sqrt[2]*d*Sqrt[e]*Sqrt[a - I*a*T
an[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) - ((5*I)*a^(7/2)*ArcTan[1 + (Sqrt[
2]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])]*Sec[
c + d*x])/(Sqrt[2]*d*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c
+ d*x]]) - (((5*I)/2)*a^(7/2)*Log[a - (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a - I*a
*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a - I*a*Tan[c + d*x])]
*Sec[c + d*x])/(Sqrt[2]*d*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*T
an[c + d*x]]) + (((5*I)/2)*a^(7/2)*Log[a + (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a
- I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a - I*a*Tan[c + d
*x])]*Sec[c + d*x])/(Sqrt[2]*d*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a +
I*a*Tan[c + d*x]]) - ((10*I)*a^2*Sqrt[a + I*a*Tan[c + d*x]])/(d*Sqrt[e*Sec[
c + d*x]]) + (I*a*(a + I*a*Tan[c + d*x])^(3/2))/(d*Sqrt[e*Sec[c + d*x]])
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
```

```
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3495

```
Int[Sqrt[(d_.)*sec[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[(-4*b*d^2)/f, Subst[Int[x^2/(a^2 + d^2*x^4), x],
 x, Sqrt[a + b*Tan[e + f*x]]/Sqrt[d*Sec[e + f*x]]], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rule 3498

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m}, x] && EqQ[a^2 + b^2, 0] && GtQ[n, 0] && NeQ[m + n - 1, 0] && IntegersQ[
2*m, 2*n]
```

Rule 3499

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(3/2)/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_
```

```
.)*(x_)]], x_Symbol] :> Dist[(d*Sec[e + f*x])/(Sqrt[a - b*Tan[e + f*x]]*Sqr
t[a + b*Tan[e + f*x]]), Int[Sqrt[d*Sec[e + f*x]]*Sqrt[a - b*Tan[e + f*x]],
x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^{5/2}}{\sqrt{e\sec(c+dx)}}\,dx = \frac{ia(a+ia\tan(c+dx))^{3/2}}{d\sqrt{e\sec(c+dx)}}+\frac{1}{2}(5a)\int \frac{(a+ia\tan(c+dx))^{3/2}}{\sqrt{e\sec(c+dx)}}\,dx$$

$$= -\frac{10ia^2\sqrt{a+ia\tan(c+dx)}}{d\sqrt{e\sec(c+dx)}}+\frac{ia(a+ia\tan(c+dx))^{3/2}}{d\sqrt{e\sec(c+dx)}}-\frac{\left(5a^3\right)\int \frac{(e\sec(c+dx))^{3/2}}{\sqrt{a+ia\tan(c+dx)}}\,dx}{2e^2}$$

$$= -\frac{10ia^2\sqrt{a+ia\tan(c+dx)}}{d\sqrt{e\sec(c+dx)}}+\frac{ia(a+ia\tan(c+dx))^{3/2}}{d\sqrt{e\sec(c+dx)}}-\frac{\left(5a^3\sec(c+dx)\right)\int \sqrt{e\sec}}{2e\sqrt{a-ia\tan(c}}$$

$$= -\frac{10ia^2\sqrt{a+ia\tan(c+dx)}}{d\sqrt{e\sec(c+dx)}}+\frac{ia(a+ia\tan(c+dx))^{3/2}}{d\sqrt{e\sec(c+dx)}}-\frac{\left(10ia^4e\sec(c+dx)\right)\text{Sub}}{d\sqrt{a-ia\tan(c+}}$$

$$= -\frac{10ia^2\sqrt{a+ia\tan(c+dx)}}{d\sqrt{e\sec(c+dx)}}+\frac{ia(a+ia\tan(c+dx))^{3/2}}{d\sqrt{e\sec(c+dx)}}+\frac{\left(5ia^4\sec(c+dx)\right)\text{Subst}}{d\sqrt{a-ia\tan(c+}}$$

$$= -\frac{10ia^2\sqrt{a+ia\tan(c+dx)}}{d\sqrt{e\sec(c+dx)}}+\frac{ia(a+ia\tan(c+dx))^{3/2}}{d\sqrt{e\sec(c+dx)}}-\frac{\left(5ia^4\sec(c+dx)\right)\text{Subst}}{2de\sqrt{a-ia\tan(}}$$

$$= -\frac{5ia^{7/2}\log\left(a-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}+\cos(c+dx)(a-ia\tan(c+dx))\right)\sec(c+}{2\sqrt{2}\,d\sqrt{e}\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}$$

$$= \frac{5ia^{7/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)\sec(c+dx)}{\sqrt{2}\,d\sqrt{e}\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}-\frac{5ia^{7/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan}}{\sqrt{a}\sqrt{e\sec(c+}}}{\sqrt{2}\,d\sqrt{e}\sqrt{a-ia\tan(c+dx)}\sqrt{}}$$

Mathematica [B] time = 6.33, size = 11357, normalized size = 20.17

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^(5/2)/Sqrt[e*Sec[c + d*x]],x]
```

```
[Out] Result too large to show
```

fricas [A] time = 0.49, size = 484, normalized size = 0.86

$$-\frac{\sqrt{\frac{25ia^5}{d^2e}}\,de\log\left(\frac{10\left(a^2e^{(2idx+2ic)}+a^2\right)\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}e^{\left(\frac{1}{2}idx+\frac{1}{2}ic\right)}+2i\sqrt{\frac{25ia^5}{d^2e}}\,de}{5a^2}\right)-\sqrt{\frac{25ia^5}{d^2e}}\,de\log\left(\frac{10\left(a^2e^{(2idx+2ic)}+a^2\right)}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(1/2),x, algorithm="frica
s")
```

```
[Out] -1/2*(sqrt(25*I*a^5/(d^2*e))*d*e*log(1/5*(10*(a^2*e^(2*I*d*x + 2*I*c) + a^2
)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/
```

```
2*I*d*x + 1/2*I*c) + 2*I*sqrt(25*I*a^5/(d^2*e))*d*e)/a^2) - sqrt(25*I*a^5/(
d^2*e))*d*e*log(1/5*(10*(a^2*e^(2*I*d*x + 2*I*c) + a^2)*sqrt(a/(e^(2*I*d*x
+ 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) -
2*I*sqrt(25*I*a^5/(d^2*e))*d*e)/a^2) + sqrt(-25*I*a^5/(d^2*e))*d*e*log(1/5*
(10*(a^2*e^(2*I*d*x + 2*I*c) + a^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(
e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + 2*I*sqrt(-25*I*a^5/(
d^2*e))*d*e)/a^2) - sqrt(-25*I*a^5/(d^2*e))*d*e*log(1/5*(10*(a^2*e^(2*I*d*x
 + 2*I*c) + a^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I
*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) - 2*I*sqrt(-25*I*a^5/(d^2*e))*d*e)/a^2) -
 2*(-8*I*a^2*e^(2*I*d*x + 2*I*c) - 10*I*a^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) +
1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))/(d*e)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(i a \tan(dx+c)+a)^{\frac{5}{2}}}{\sqrt{e\sec(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(5/2)/sqrt(e*sec(d*x + c)), x)
```

maple [A] time = 1.26, size = 347, normalized size = 0.62

$$-\frac{\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(-5i\cos(dx+c)\sin(dx+c)\sqrt{\frac{1}{1+\cos(dx+c)}}\;\operatorname{arctanh}\left(\frac{\sqrt{\frac{1}{1+\cos(dx+c)}}\;(\cos(dx+c)+1-\sin(dx+c))}{2}\right)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(1/2),x)
```

```
[Out] -1/2/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(-5*I*cos(d*x+c)*sin(
d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d
*x+c)+1-sin(d*x+c)))+5*I*cos(d*x+c)*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*arc
tanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+5*cos(d*x+c)*s
in(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(co
s(d*x+c)+1-sin(d*x+c)))+5*cos(d*x+c)*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*ar
ctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+16*I*cos(d*x+
c)^2-18*I*cos(d*x+c)-16*cos(d*x+c)*sin(d*x+c)+2*I-2*sin(d*x+c))/(I*sin(d*x+
c)+cos(d*x+c)-1)/cos(d*x+c)/(e/cos(d*x+c))^(1/2)*a^2
```

maxima [B] time = 1.35, size = 2015, normalized size = 3.58

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(1/2),x, algorithm="maxim
a")
```

```
[Out] ((80*sqrt(2)*a^2*cos(2*d*x + 2*c) + 80*I*sqrt(2)*a^2*sin(2*d*x + 2*c) + 80*
sqrt(2)*a^2)*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
2*c))) + 1, sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) +
1) + (80*sqrt(2)*a^2*cos(2*d*x + 2*c) + 80*I*sqrt(2)*a^2*sin(2*d*x + 2*c) +
 80*sqrt(2)*a^2)*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*
x + 2*c))) + 1, -sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
```

```
)) + 1) + (80*sqrt(2)*a^2*cos(2*d*x + 2*c) + 80*I*sqrt(2)*a^2*sin(2*d*x + 2
*c) + 80*sqrt(2)*a^2)*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c))) - 1, sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
2*c))) + 1) + (80*sqrt(2)*a^2*cos(2*d*x + 2*c) + 80*I*sqrt(2)*a^2*sin(2*d*x
 + 2*c) + 80*sqrt(2)*a^2)*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c))) - 1, -sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c))) + 1) + (80*I*sqrt(2)*a^2*cos(2*d*x + 2*c) - 80*sqrt(2)*a^2*sin(
2*d*x + 2*c) + 80*I*sqrt(2)*a^2)*arctan2(sqrt(2)*sin(1/4*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
2*c))), sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(
1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (-80*I*sqrt(2)*a^2*
cos(2*d*x + 2*c) + 80*sqrt(2)*a^2*sin(2*d*x + 2*c) - 80*I*sqrt(2)*a^2)*arct
an2(-sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))), -sqrt(2)*cos(1/4*arctan2(sin
(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c))) + 1) - (512*a^2*cos(2*d*x + 2*c) + 512*I*a^2*sin(2*d*x + 2*c)
 + 640*a^2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + (40*sqrt
(2)*a^2*cos(2*d*x + 2*c) + 40*I*sqrt(2)*a^2*sin(2*d*x + 2*c) + 40*sqrt(2)*a
^2)*log(2*sqrt(2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(
1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2*(sqrt(2)*cos(1/4*arcta
n2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*
c), cos(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
))^2 + 2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*a
rctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x
 + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c))) + 1) - (40*sqrt(2)*a^2*cos(2*d*x + 2*c) + 40*I*sqrt(2)*
a^2*sin(2*d*x + 2*c) + 40*sqrt(2)*a^2)*log(-2*sqrt(2)*sin(1/2*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c))) - 2*(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
 - 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arctan
2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*cos(1/4*arctan2(sin(2*d*x + 2*
c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*
c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sqrt(
2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (40*I*sqrt(2
)*a^2*cos(2*d*x + 2*c) - 40*sqrt(2)*a^2*sin(2*d*x + 2*c) + 40*I*sqrt(2)*a^2
)*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*
arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(
sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c))) + 2) + (-40*I*sqrt(2)*a^2*cos(2*d*x + 2*c) + 40*
sqrt(2)*a^2*sin(2*d*x + 2*c) - 40*I*sqrt(2)*a^2)*log(2*cos(1/4*arctan2(sin(
2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c))) - 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) +
 2) + (40*I*sqrt(2)*a^2*cos(2*d*x + 2*c) - 40*sqrt(2)*a^2*sin(2*d*x + 2*c)
+ 40*I*sqrt(2)*a^2)*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c
)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sqrt(2
)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2*sqrt(2)*sin(1/4*
arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) + (-40*I*sqrt(2)*a^2*cos(
2*d*x + 2*c) + 40*sqrt(2)*a^2*sin(2*d*x + 2*c) - 40*I*sqrt(2)*a^2)*log(2*co
s(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(si
n(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c))) - 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c))) + 2) + (-512*I*a^2*cos(2*d*x + 2*c) + 512*a^2*sin(2*d*x +
2*c) - 640*I*a^2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))))*sqr
t(a)*sqrt(e)/((-64*I*e*cos(2*d*x + 2*c) + 64*e*sin(2*d*x + 2*c) - 64*I*e)*d
)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + a\tan(c + d\,x)\ 1\mathrm{i})^{5/2}}{\sqrt{\frac{e}{\cos(c+d\,x)}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(5/2)/(e/cos(c + d*x))^(1/2),x)
[Out] int((a + a*tan(c + d*x)*1i)^(5/2)/(e/cos(c + d*x))^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**(5/2)/(e*sec(d*x+c))**(1/2),x)
[Out] Timed out
```

3.411 $\int \frac{(a+ia\tan(c+dx))^{5/2}}{(e\sec(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=362

$$-\frac{i\sqrt{2}\,a^{5/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{de^{3/2}}+\frac{i\sqrt{2}\,a^{5/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{de^{3/2}}+\frac{ia^{5/2}\log\left(-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a+ia\tan(c}}{\sqrt{e\sec(c+dx)}}\right.}{}$$

```
[Out] 1/2*I*a^(5/2)*ln(a-2^(1/2)*a^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/(e*sec(
d*x+c))^(1/2)+cos(d*x+c)*(a+I*a*tan(d*x+c)))/d/e^(3/2)*2^(1/2)-1/2*I*a^(5/2
)*ln(a+2^(1/2)*a^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2
)+cos(d*x+c)*(a+I*a*tan(d*x+c)))/d/e^(3/2)*2^(1/2)-I*a^(5/2)*arctan(1-2^(1/
2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*sec(d*x+c))^(1/2))*2^(1/2)/d
/e^(3/2)+I*a^(5/2)*arctan(1+2^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/a^(1/2
)/(e*sec(d*x+c))^(1/2))*2^(1/2)/d/e^(3/2)-4/3*I*a*(a+I*a*tan(d*x+c))^(3/2)/
d/(e*sec(d*x+c))^(3/2)
```

Rubi [A] time = 0.33, antiderivative size = 362, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {3496, 3495, 297, 1162, 617, 204, 1165, 628}

$$-\frac{i\sqrt{2}\,a^{5/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{de^{3/2}}+\frac{i\sqrt{2}\,a^{5/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{de^{3/2}}+\frac{ia^{5/2}\log\left(-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a+ia\tan(c}}{\sqrt{e\sec(c+dx)}}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^(5/2)/(e*Sec[c + d*x])^(3/2),x]
```

```
[Out] ((-I)*Sqrt[2]*a^(5/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]
])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])])/(d*e^(3/2)) + (I*Sqrt[2]*a^(5/2)*ArcTan
[1 + (Sqrt[2]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d
*x]])])/(d*e^(3/2)) + (I*a^(5/2)*Log[a - (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a +
I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a + I*a*Tan[c + d*x
])])/(Sqrt[2]*d*e^(3/2)) - (I*a^(5/2)*Log[a + (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt
[a + I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a + I*a*Tan[c
+ d*x])])/(Sqrt[2]*d*e^(3/2)) - (((4*I)/3)*a*(a + I*a*Tan[c + d*x])^(3/2))/
(d*(e*Sec[c + d*x])^(3/2))
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3495

```
Int[Sqrt[(d_.)*sec[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[(-4*b*d^2)/f, Subst[Int[x^2/(a^2 + d^2*x^4), x],
 x, Sqrt[a + b*Tan[e + f*x]]/Sqrt[d*Sec[e + f*x]]], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3496

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(
n - 1))/(f*m), x] - Dist[(b^2*(m + 2*n - 2))/(d^2*m), Int[(d*Sec[e + f*x])^
(m + 2)*(a + b*Tan[e + f*x])^(n - 2), x], x] /; FreeQ[{a, b, d, e, f}, x] &
& EqQ[a^2 + b^2, 0] && GtQ[n, 1] && ((IGtQ[n/2, 0] && ILtQ[m - 1/2, 0]) ||
(EqQ[n, 2] && LtQ[m, 0]) || (LeQ[m, -1] && GtQ[m + n, 0]) || (ILtQ[m, 0] &&
 LtQ[m/2 + n - 1, 0] && IntegerQ[n]) || (EqQ[n, 3/2] && EqQ[m, -2^(-1)])) &
& IntegerQ[2*m]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^{5/2}}{(e\sec(c+dx))^{3/2}}\,dx = -\frac{4ia(a+ia\tan(c+dx))^{3/2}}{3d(e\sec(c+dx))^{3/2}} - \frac{a^2\int \sqrt{e\sec(c+dx)}\,\sqrt{a+ia\tan(c+dx)}\,dx}{e^2}$$

$$= -\frac{4ia(a+ia\tan(c+dx))^{3/2}}{3d(e\sec(c+dx))^{3/2}} + \frac{(4ia^3)\,\text{Subst}\left(\int \frac{x^2}{a^2+e^2x^4}\,dx, x, \frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\right)}{d}$$

$$= -\frac{4ia(a+ia\tan(c+dx))^{3/2}}{3d(e\sec(c+dx))^{3/2}} - \frac{(2ia^3)\,\text{Subst}\left(\int \frac{a-ex^2}{a^2+e^2x^4}\,dx, x, \frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\right)}{de} + \frac{(2ia^3}{}$$

$$= -\frac{4ia(a+ia\tan(c+dx))^{3/2}}{3d(e\sec(c+dx))^{3/2}} + \frac{(ia^3)\,\text{Subst}\left(\int \frac{1}{\frac{a}{e}-\frac{\sqrt{2}\sqrt{a}x}{\sqrt{e}}+x^2}\,dx, x, \frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\right)}{de^2} + -$$

$$= \frac{ia^{5/2}\log\left(a-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}+\cos(c+dx)(a+ia\tan(c+dx))\right)}{\sqrt{2}\,de^{3/2}} - \frac{ia^{5/2}\log}{}$$

$$= -\frac{i\sqrt{2}\,a^{5/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{de^{3/2}} + \frac{i\sqrt{2}\,a^{5/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{de^{3/2}}$$

Mathematica [A] time = 3.65, size = 343, normalized size = 0.95

$$\frac{e(a+ia\tan(c+dx))^{5/2}\left(-\frac{4}{3}i(\cos(c)-i\sin(c))\cos(dx)+\frac{4}{3}(\cos(c)-i\sin(c))\sin(dx)+\frac{2(\cos(2c)-i\sin(2c))\sqrt{\tan\left(\frac{dx}{2}\right)+i}\left(\surd\right.}{}\right.}{d(\cos(dx)+i}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^(5/2)/(e*Sec[c + d*x])^(3/2),x]
```

```
[Out] (e*(((-4*I)/3)*Cos[d*x]*(Cos[c] - I*Sin[c]) + (4*(Cos[c] - I*Sin[c])*Sin[d*
x])/3 + (2*(ArcTanh[(Sqrt[1 - I*Cos[c] + Sin[c]]*Sqrt[I - Tan[(d*x)/2]])/(S
qrt[-1 - I*Cos[c] - Sin[c]]*Sqrt[I + Tan[(d*x)/2]])]*Sqrt[-1 - I*Cos[c] - S
in[c]]*Sqrt[1 + I*Cos[c] - Sin[c]] - ArcTanh[(Sqrt[1 + I*Cos[c] - Sin[c]]*S
qrt[I - Tan[(d*x)/2]])/(Sqrt[-1 + I*Cos[c] + Sin[c]]*Sqrt[I + Tan[(d*x)/2]]
)]*Sqrt[1 - I*Cos[c] + Sin[c]]*Sqrt[-1 + I*Cos[c] + Sin[c]])*(Cos[2*c] - I*
Sin[2*c])*Sqrt[I + Tan[(d*x)/2]])/(Sqrt[1 + Cos[2*c] + I*Sin[2*c]]*Sqrt[I -
 Tan[(d*x)/2]]))*(a + I*a*Tan[c + d*x])^(5/2))/(d*(e*Sec[c + d*x])^(5/2)*(C
os[d*x] + I*Sin[d*x])^2)
```

fricas [A] time = 0.56, size = 505, normalized size = 1.40

$$-\frac{3\,de^2\sqrt{\frac{4i\,a^5}{d^2e^3}}\,\log\left(\frac{de^2\sqrt{\frac{4i\,a^5}{d^2e^3}}+2\left(a^2e^{(2i\,dx+2i\,c)}+a^2\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\,\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}}{a^2}\right)-3\,de^2\sqrt{\frac{4i\,a^5}{d^2e^3}}\,\log\left(-\frac{de^2\sqrt{\frac{4i\,a^5}{d^2e^3}}-2\left(a^2e^{(}\right.}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(3/2),x, algorithm="frica
s")
```

```
[Out] -1/6*(3*d*e^2*sqrt(4*I*a^5/(d^2*e^3))*log((d*e^2*sqrt(4*I*a^5/(d^2*e^3)) +
2*(a^2*e^(2*I*d*x + 2*I*c) + a^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/
```

```
(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))/a^2) - 3*d*e^2*sqrt(4*I
*a^5/(d^2*e^3))*log(-(d*e^2*sqrt(4*I*a^5/(d^2*e^3)) - 2*(a^2*e^(2*I*d*x + 2
*I*c) + a^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c)
+ 1))*e^(1/2*I*d*x + 1/2*I*c))/a^2) - 3*d*e^2*sqrt(-4*I*a^5/(d^2*e^3))*log(
(d*e^2*sqrt(-4*I*a^5/(d^2*e^3)) + 2*(a^2*e^(2*I*d*x + 2*I*c) + a^2)*sqrt(a/
(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x +
 1/2*I*c))/a^2) + 3*d*e^2*sqrt(-4*I*a^5/(d^2*e^3))*log(-(d*e^2*sqrt(-4*I*a^
5/(d^2*e^3)) - 2*(a^2*e^(2*I*d*x + 2*I*c) + a^2)*sqrt(a/(e^(2*I*d*x + 2*I*c
) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))/a^2) - 2
*(-4*I*a^2*e^(3*I*d*x + 3*I*c) - 4*I*a^2*e^(I*d*x + I*c))*sqrt(a/(e^(2*I*d*
x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))
/(d*e^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(i a \tan(dx+c)+a)^{\frac{5}{2}}}{(e \sec(dx+c))^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(3/2),x, algorithm="giac"
)
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(5/2)/(e*sec(d*x + c))^(3/2), x)
```

maple [A] time = 1.22, size = 323, normalized size = 0.89

$$-\frac{\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(-3i\operatorname{arctanh}\left(\frac{\sqrt{\frac{1}{1+\cos(dx+c)}}\,(\cos(dx+c)+1-\sin(dx+c))}{2}\right)\sqrt{\frac{1}{1+\cos(dx+c)}}\,\sin(dx+c)+3i\operatorname{arctanh}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(3/2),x)
```

```
[Out] -1/3/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(-3*I*arctanh(1/2*(1/
(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))*(1/(1+cos(d*x+c)))^(1/2)*s
in(d*x+c)+3*I*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)
))*(1/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)+8*I*cos(d*x+c)^2-3*arctanh(1/2*(1/(1
+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))*(1/(1+cos(d*x+c)))^(1/2)*sin
(d*x+c)-3*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))*(
1/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)-8*cos(d*x+c)*sin(d*x+c)-4*I*cos(d*x+c)+4
*sin(d*x+c)-4*I)/(I*sin(d*x+c)+cos(d*x+c)-1)/cos(d*x+c)/(e/cos(d*x+c))^(3/2
)*a^2
```

maxima [B] time = 1.00, size = 1492, normalized size = 4.12

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(3/2),x, algorithm="maxim
a")
```

```
[Out] -1/12*(-6*I*sqrt(2)*a^2*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), c
os(2*d*x + 2*c))) + 1, sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c))) + 1) - 6*I*sqrt(2)*a^2*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c))) + 1, -sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), c
```

```
os(2*d*x + 2*c))) + 1) - 6*I*sqrt(2)*a^2*arctan2(sqrt(2)*cos(1/4*arctan2(si
n(2*d*x + 2*c), cos(2*d*x + 2*c))) - 1, sqrt(2)*sin(1/4*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c))) + 1) - 6*I*sqrt(2)*a^2*arctan2(sqrt(2)*cos(1/4*ar
ctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 1, -sqrt(2)*sin(1/4*arctan2(si
n(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - 6*sqrt(2)*a^2*arctan2(sqrt(2)*sin
(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d
*x + 2*c), cos(2*d*x + 2*c))), sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1
) + 6*sqrt(2)*a^2*arctan2(-sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*
d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))), -sqrt(
2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arctan2(s
in(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + 3*I*sqrt(2)*a^2*log(2*sqrt(2)*si
n(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/4*arctan2(sin(2*d*
x + 2*c), cos(2*d*x + 2*c))) + 2*(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c),
 cos(2*d*x + 2*c))) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
)) + cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*cos(1/4*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
 2*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
+ 1) - 3*I*sqrt(2)*a^2*log(-2*sqrt(2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c)))*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 2*(s
qrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 1)*cos(1/2*ar
ctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x + 2*
c), cos(2*d*x + 2*c)))^2 + 2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1
/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*arcta
n2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + 3*sqrt(2)*a^2*log(2*cos(1/4*
arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*
x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c)
, cos(2*d*x + 2*c))) + 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*
x + 2*c))) + 2) - 3*sqrt(2)*a^2*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^
2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 2*sqrt
(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) + 3*sqrt(2)*a
^2*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2
(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x
 + 2*c), cos(2*d*x + 2*c))) + 2) - 3*sqrt(2)*a^2*log(2*cos(1/4*arctan2(sin(
2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c))) - 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) +
 2) + 16*I*a^2*cos(3/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 16*a^
2*sin(3/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))))*sqrt(a)/(d*e^(3/2))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + a\tan(c + d\,x)\,1\mathrm{i})^{5/2}}{\left(\frac{e}{\cos(c+d\,x)}\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(5/2)/(e/cos(c + d*x))^(3/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^(5/2)/(e/cos(c + d*x))^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**(5/2)/(e*sec(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

3.412 $\int \frac{(a+ia\tan(c+dx))^{5/2}}{(e\sec(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=38

$$-\frac{2i(a+ia\tan(c+dx))^{5/2}}{5d(e\sec(c+dx))^{5/2}}$$

```
[Out] -2/5*I*(a+I*a*tan(d*x+c))^(5/2)/d/(e*sec(d*x+c))^(5/2)
```

Rubi [A] time = 0.07, antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.033$, Rules used = {3488}

$$-\frac{2i(a+ia\tan(c+dx))^{5/2}}{5d(e\sec(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^(5/2)/(e*Sec[c + d*x])^(5/2),x]
```

```
[Out] (((-2*I)/5)*(a + I*a*Tan[c + d*x])^(5/2))/(d*(e*Sec[c + d*x])^(5/2))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^{5/2}}{(e\sec(c+dx))^{5/2}}\,dx = -\frac{2i(a+ia\tan(c+dx))^{5/2}}{5d(e\sec(c+dx))^{5/2}}$$

Mathematica [A] time = 0.12, size = 38, normalized size = 1.00

$$-\frac{2i(a+ia\tan(c+dx))^{5/2}}{5d(e\sec(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^(5/2)/(e*Sec[c + d*x])^(5/2),x]
```

```
[Out] (((-2*I)/5)*(a + I*a*Tan[c + d*x])^(5/2))/(d*(e*Sec[c + d*x])^(5/2))
```

fricas [B] time = 0.61, size = 80, normalized size = 2.11

$$\frac{2\left(-i\,a^2e^{(4i\,dx+4i\,c)}-i\,a^2e^{(2i\,dx+2i\,c)}\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\,\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}}{5\,de^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(5/2),x, algorithm="frica
s")
```

```
[Out] 2/5*(-I*a^2*e^(4*I*d*x + 4*I*c) - I*a^2*e^(2*I*d*x + 2*I*c))*sqrt(a/(e^(2*I
*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*
c)/(d*e^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ia\tan(dx+c)+a)^{\frac{5}{2}}}{(e\sec(dx+c))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(5/2),x, algorithm="giac"
)
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(5/2)/(e*sec(d*x + c))^(5/2), x)
```

maple [B] time = 1.21, size = 88, normalized size = 2.32

$$-\frac{2\left(2i\left(\cos^2(dx+c)\right)-2\cos(dx+c)\sin(dx+c)-i\right)\left(\cos^3(dx+c)\right)\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(\frac{e}{\cos(dx+c)}\right)^{\frac{5}{2}}a^2}{5d\,e^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(5/2),x)
```

```
[Out] -2/5/d*(2*I*cos(d*x+c)^2-2*cos(d*x+c)*sin(d*x+c)-I)*cos(d*x+c)^3*(a*(I*sin(
d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(e/cos(d*x+c))^(5/2)/e^5*a^2
```

maxima [B] time = 0.89, size = 76, normalized size = 2.00

$$-\frac{2i\,a^{\frac{5}{2}}\left(-\frac{2i\sin(dx+c)}{\cos(dx+c)+1}+\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-1\right)^{\frac{5}{2}}}{5\,de^{\frac{5}{2}}\left(-\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-1\right)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(5/2),x, algorithm="maxim
a")
```

```
[Out] -2/5*I*a^(5/2)*(-2*I*sin(d*x + c)/(cos(d*x + c) + 1) + sin(d*x + c)^2/(cos(
d*x + c) + 1)^2 - 1)^(5/2)/(d*e^(5/2)*(-sin(d*x + c)^2/(cos(d*x + c) + 1)^2
 - 1)^(5/2))
```

mupad [B] time = 4.55, size = 104, normalized size = 2.74

$$-\frac{a^2\sqrt{\frac{e}{\cos(c+d\,x)}}\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1{}\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}\,(-\sin(c+d\,x)-\sin(3\,c+3\,d\,x)+\cos(c+d\,x)\,1{}\mathrm{i}+\cos(3\,c-}{5\,d\,e^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(5/2)/(e/cos(c + d*x))^(5/2),x)
```

```
[Out] -(a^2*(e/cos(c + d*x))^(1/2)*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i +
1))/(cos(2*c + 2*d*x) + 1))^(1/2)*(cos(c + d*x)*1i - sin(c + d*x) + cos(3*c
 + 3*d*x)*1i - sin(3*c + 3*d*x)))/(5*d*e^3)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**(5/2)/(e*sec(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.413 $\int \frac{(a+ia\tan(c+dx))^{5/2}}{(e\sec(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=81

$$-\frac{4ia(a+ia\tan(c+dx))^{3/2}}{21de^2(e\sec(c+dx))^{3/2}}-\frac{2i(a+ia\tan(c+dx))^{5/2}}{7d(e\sec(c+dx))^{7/2}}$$

```
[Out] -4/21*I*a*(a+I*a*tan(d*x+c))^(3/2)/d/e^2/(e*sec(d*x+c))^(3/2)-2/7*I*(a+I*a*
tan(d*x+c))^(5/2)/d/(e*sec(d*x+c))^(7/2)
```

Rubi [A] time = 0.15, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {3497, 3488}

$$-\frac{4ia(a+ia\tan(c+dx))^{3/2}}{21de^2(e\sec(c+dx))^{3/2}}-\frac{2i(a+ia\tan(c+dx))^{5/2}}{7d(e\sec(c+dx))^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^(5/2)/(e*Sec[c + d*x])^(7/2),x]
```

```
[Out] (((-4*I)/21)*a*(a + I*a*Tan[c + d*x])^(3/2))/(d*e^2*(e*Sec[c + d*x])^(3/2))
 - (((2*I)/7)*(a + I*a*Tan[c + d*x])^(5/2))/(d*(e*Sec[c + d*x])^(7/2))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rubi steps

$$\begin{aligned}\int \frac{(a+ia\tan(c+dx))^{5/2}}{(e\sec(c+dx))^{7/2}}\,dx &= -\frac{2i(a+ia\tan(c+dx))^{5/2}}{7d(e\sec(c+dx))^{7/2}}+\frac{(2a)\int \frac{(a+ia\tan(c+dx))^{3/2}}{(e\sec(c+dx))^{3/2}}\,dx}{7e^2}\\ &= -\frac{4ia(a+ia\tan(c+dx))^{3/2}}{21de^2(e\sec(c+dx))^{3/2}}-\frac{2i(a+ia\tan(c+dx))^{5/2}}{7d(e\sec(c+dx))^{7/2}}\end{aligned}$$

Mathematica [A] time = 0.45, size = 92, normalized size = 1.14

$$-\frac{2a^2(2\tan(c+dx)+5i)\sqrt{a+ia\tan(c+dx)}\,(\cos(2(c+2dx))+i\sin(2(c+2dx)))}{21de^2(\cos(dx)+i\sin(dx))^2(e\sec(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^(5/2)/(e*Sec[c + d*x])^(7/2),x]
```

```
[Out] (-2*a^2*(Cos[2*(c + 2*d*x)] + I*Sin[2*(c + 2*d*x)])*(5*I + 2*Tan[c + d*x])*
Sqrt[a + I*a*Tan[c + d*x]])/(21*d*e^2*(e*Sec[c + d*x])^(3/2)*(Cos[d*x] + I*
Sin[d*x])^2)
```

fricas [A] time = 0.63, size = 94, normalized size = 1.16

$$\frac{\left(-3i\,a^2e^{(5i\,dx+5i\,c)}-10i\,a^2e^{(3i\,dx+3i\,c)}-7i\,a^2e^{(i\,dx+i\,c)}\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}}{21\,de^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(7/2),x, algorithm="frica
s")
```

```
[Out] 1/21*(-3*I*a^2*e^(5*I*d*x + 5*I*c) - 10*I*a^2*e^(3*I*d*x + 3*I*c) - 7*I*a^2
*e^(I*d*x + I*c))*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*
I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(d*e^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(i\,a\tan(dx+c)+a)^{\frac{5}{2}}}{(e\sec(dx+c))^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(7/2),x, algorithm="giac"
)
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(5/2)/(e*sec(d*x + c))^(7/2), x)
```

maple [A] time = 1.21, size = 105, normalized size = 1.30

$$-\frac{2\left(6i\left(\cos^3(dx+c)\right)-6\left(\cos^2(dx+c)\right)\sin(dx+c)-i\cos(dx+c)-2\sin(dx+c)\right)\left(\cos^4(dx+c)\right)\sqrt{\frac{a(i\sin(d}{}}}{21d\,e^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(7/2),x)
```

```
[Out] -2/21/d*(6*I*cos(d*x+c)^3-6*cos(d*x+c)^2*sin(d*x+c)-I*cos(d*x+c)-2*sin(d*x+
c))*cos(d*x+c)^4*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(e/cos(d*x+
c))^(7/2)/e^7*a^2
```

maxima [A] time = 1.05, size = 94, normalized size = 1.16

$$\frac{\left(-7i\,a^2\cos\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right)-3i\,a^2\cos\left(\frac{7}{3}\,\arctan\left(\sin\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right),\cos\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right)\right)\right)+7\,a^2\sin\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right)+3\,}{21\,de^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(7/2),x, algorithm="maxim
a")
```

```
[Out] 1/21*(-7*I*a^2*cos(3/2*d*x + 3/2*c) - 3*I*a^2*cos(7/3*arctan2(sin(3/2*d*x +
 3/2*c), cos(3/2*d*x + 3/2*c))) + 7*a^2*sin(3/2*d*x + 3/2*c) + 3*a^2*sin(7/
3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*sqrt(a)/(d*e^(7/2))
```

mupad [B] time = 4.99, size = 112, normalized size = 1.38

$$-\frac{a^2\sqrt{\frac{e}{\cos(c+d\,x)}}\,\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}\,\left(\cos(2\,c+2\,d\,x)\,10\mathrm{i}+\cos(4\,c+4\,d\,x)\,3\mathrm{i}-10\,\sin(2\,c+2\,d\,x\right.}{42\,d\,e^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(5/2)/(e/cos(c + d*x))^(7/2),x)
```

```
[Out] -(a^2*(e/cos(c + d*x))^(1/2)*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i +
1))/(cos(2*c + 2*d*x) + 1))^(1/2)*(cos(2*c + 2*d*x)*10i + cos(4*c + 4*d*x)*
3i - 10*sin(2*c + 2*d*x) - 3*sin(4*c + 4*d*x) + 7i))/(42*d*e^4)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**(5/2)/(e*sec(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.414 $\int \frac{(a+ia\tan(c+dx))^{5/2}}{(e\sec(c+dx))^{9/2}}\,dx$

Optimal. Leaf size=125

$$-\frac{16ia^2\sqrt{a+ia\tan(c+dx)}}{45de^4\sqrt{e\sec(c+dx)}}-\frac{8ia(a+ia\tan(c+dx))^{3/2}}{45de^2(e\sec(c+dx))^{5/2}}-\frac{2i(a+ia\tan(c+dx))^{5/2}}{9d(e\sec(c+dx))^{9/2}}$$

```
[Out] -16/45*I*a^2*(a+I*a*tan(d*x+c))^(1/2)/d/e^4/(e*sec(d*x+c))^(1/2)-8/45*I*a*(
a+I*a*tan(d*x+c))^(3/2)/d/e^2/(e*sec(d*x+c))^(5/2)-2/9*I*(a+I*a*tan(d*x+c))
^(5/2)/d/(e*sec(d*x+c))^(9/2)
```

Rubi [A] time = 0.22, antiderivative size = 125, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$, Rules used = {3497, 3488}

$$-\frac{16ia^2\sqrt{a+ia\tan(c+dx)}}{45de^4\sqrt{e\sec(c+dx)}}-\frac{8ia(a+ia\tan(c+dx))^{3/2}}{45de^2(e\sec(c+dx))^{5/2}}-\frac{2i(a+ia\tan(c+dx))^{5/2}}{9d(e\sec(c+dx))^{9/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^(5/2)/(e*Sec[c + d*x])^(9/2),x]
```

```
[Out] (((-16*I)/45)*a^2*Sqrt[a + I*a*Tan[c + d*x]])/(d*e^4*Sqrt[e*Sec[c + d*x]])
- (((8*I)/45)*a*(a + I*a*Tan[c + d*x])^(3/2))/(d*e^2*(e*Sec[c + d*x])^(5/2)
) - (((2*I)/9)*(a + I*a*Tan[c + d*x])^(5/2))/(d*(e*Sec[c + d*x])^(9/2))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rubi steps

$$\begin{aligned}
\int \frac{(a+ia\tan(c+dx))^{5/2}}{(e\sec(c+dx))^{9/2}}\,dx &= -\frac{2i(a+ia\tan(c+dx))^{5/2}}{9d(e\sec(c+dx))^{9/2}}+\frac{(4a)\int \frac{(a+ia\tan(c+dx))^{3/2}}{(e\sec(c+dx))^{5/2}}\,dx}{9e^2}\\
&= -\frac{8ia(a+ia\tan(c+dx))^{3/2}}{45de^2(e\sec(c+dx))^{5/2}}-\frac{2i(a+ia\tan(c+dx))^{5/2}}{9d(e\sec(c+dx))^{9/2}}+\frac{\left(8a^2\right)\int \frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}}{45e^4}\\
&= -\frac{16ia^2\sqrt{a+ia\tan(c+dx)}}{45de^4\sqrt{e\sec(c+dx)}}-\frac{8ia(a+ia\tan(c+dx))^{3/2}}{45de^2(e\sec(c+dx))^{5/2}}-\frac{2i(a+ia\tan(c+dx))^{5/2}}{9d(e\sec(c+dx))^{9/2}}
\end{aligned}$$

Mathematica [A] time = 0.48, size = 104, normalized size = 0.83

$$\frac{a^2\sqrt{a+ia\tan(c+dx)}\,(-20i\sin(2(c+dx))+25\cos(2(c+dx))+9)(\sin(2(c+2dx))-i\cos(2(c+2dx)))}{45de^4(\cos(dx)+i\sin(dx))^2\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^(5/2)/(e*Sec[c + d*x])^(9/2),x]
```

```
[Out] (a^2*(9 + 25*Cos[2*(c + d*x)] - (20*I)*Sin[2*(c + d*x)])*((-I)*Cos[2*(c + 2
*d*x)] + Sin[2*(c + 2*d*x)])*Sqrt[a + I*a*Tan[c + d*x]])/(45*d*e^4*Sqrt[e*S
ec[c + d*x]]*(Cos[d*x] + I*Sin[d*x])^2)
```

fricas [A] time = 0.69, size = 99, normalized size = 0.79

$$\frac{\left(-5i\,a^2e^{(6i\,dx+6i\,c)} - 23i\,a^2e^{(4i\,dx+4i\,c)} - 63i\,a^2e^{(2i\,dx+2i\,c)} - 45i\,a^2\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}}{90\,de^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(9/2),x, algorithm="frica
s")
```

```
[Out] 1/90*(-5*I*a^2*e^(6*I*d*x + 6*I*c) - 23*I*a^2*e^(4*I*d*x + 4*I*c) - 63*I*a^
2*e^(2*I*d*x + 2*I*c) - 45*I*a^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/
(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/(d*e^5)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(i\,a\tan(dx+c)+a)^{\frac{5}{2}}}{(e\sec(dx+c))^{\frac{9}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(9/2),x, algorithm="giac"
)
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(5/2)/(e*sec(d*x + c))^(9/2), x)
```

maple [A] time = 1.27, size = 115, normalized size = 0.92

$$-\frac{2\left(10i\left(\cos^4(dx+c)\right) - 10\left(\cos^3(dx+c)\right)\sin(dx+c) - i\left(\cos^2(dx+c)\right) - 4\cos(dx+c)\sin(dx+c) + 8i\right)\sqrt{\frac{a(i}{\ }}}{45d\,e^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(9/2),x)
```

```
[Out] -2/45/d*(10*I*cos(d*x+c)^4-10*cos(d*x+c)^3*sin(d*x+c)-I*cos(d*x+c)^2-4*cos(
d*x+c)*sin(d*x+c)+8*I)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(e/co
s(d*x+c))^(9/2)*cos(d*x+c)^5/e^9*a^2
```

maxima [A] time = 1.16, size = 96, normalized size = 0.77

$$\frac{\left(-5i\,a^2\cos\left(\frac{9}{2}\,dx+\frac{9}{2}\,c\right) - 18i\,a^2\cos\left(\frac{5}{2}\,dx+\frac{5}{2}\,c\right) - 45i\,a^2\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right) + 5\,a^2\sin\left(\frac{9}{2}\,dx+\frac{9}{2}\,c\right) + 18\,a^2\sin\left(\frac{5}{2}\,dx\right.}{90\,de^{\frac{9}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(9/2),x, algorithm="maxim
a")
```

```
[Out] 1/90*(-5*I*a^2*cos(9/2*d*x + 9/2*c) - 18*I*a^2*cos(5/2*d*x + 5/2*c) - 45*I*
a^2*cos(1/2*d*x + 1/2*c) + 5*a^2*sin(9/2*d*x + 9/2*c) + 18*a^2*sin(5/2*d*x
+ 5/2*c) + 45*a^2*sin(1/2*d*x + 1/2*c))*sqrt(a)/(d*e^(9/2))
```

mupad [B] time = 5.52, size = 127, normalized size = 1.02

$$-\frac{a^2\sqrt{\frac{e}{\cos(c+d\,x)}}\,\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}\,\left(-18\,\sin\left(c+d\,x\right)-23\,\sin\left(3\,c+3\,d\,x\right)-5\,\sin\left(5\,c+5\,d\,x\right)+\right.}{180\,d\,e^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(5/2)/(e/cos(c + d*x))^(9/2),x)
```

```
[Out] -(a^2*(e/cos(c + d*x))^(1/2)*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i +
1))/(cos(2*c + 2*d*x) + 1))^(1/2)*(cos(c + d*x)*108i - 18*sin(c + d*x) + co
s(3*c + 3*d*x)*23i + cos(5*c + 5*d*x)*5i - 23*sin(3*c + 3*d*x) - 5*sin(5*c
+ 5*d*x)))/(180*d*e^5)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**(5/2)/(e*sec(d*x+c))**(9/2),x)
```

```
[Out] Timed out
```

3.415 $\int \frac{(a+ia\tan(c+dx))^{5/2}}{(e\sec(c+dx))^{11/2}}\,dx$

Optimal. Leaf size=169

$$\frac{32ia^3\sqrt{e\sec(c+dx)}}{77de^6\sqrt{a+ia\tan(c+dx)}}-\frac{16ia^2\sqrt{a+ia\tan(c+dx)}}{77de^4(e\sec(c+dx))^{3/2}}-\frac{12ia(a+ia\tan(c+dx))^{3/2}}{77de^2(e\sec(c+dx))^{7/2}}-\frac{2i(a+ia\tan(c+dx))^{5/2}}{11d(e\sec(c+dx))^{11/2}}$$

```
[Out] 32/77*I*a^3*(e*sec(d*x+c))^(1/2)/d/e^6/(a+I*a*tan(d*x+c))^(1/2)-16/77*I*a^2
*(a+I*a*tan(d*x+c))^(1/2)/d/e^4/(e*sec(d*x+c))^(3/2)-12/77*I*a*(a+I*a*tan(d
*x+c))^(3/2)/d/e^2/(e*sec(d*x+c))^(7/2)-2/11*I*(a+I*a*tan(d*x+c))^(5/2)/d/(
e*sec(d*x+c))^(11/2)
```

Rubi [A] time = 0.31, antiderivative size = 169, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {3497, 3488}

$$\frac{32ia^3\sqrt{e\sec(c+dx)}}{77de^6\sqrt{a+ia\tan(c+dx)}}-\frac{16ia^2\sqrt{a+ia\tan(c+dx)}}{77de^4(e\sec(c+dx))^{3/2}}-\frac{12ia(a+ia\tan(c+dx))^{3/2}}{77de^2(e\sec(c+dx))^{7/2}}-\frac{2i(a+ia\tan(c+dx))^{5/2}}{11d(e\sec(c+dx))^{11/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^(5/2)/(e*Sec[c + d*x])^(11/2),x]
```

```
[Out] (((32*I)/77)*a^3*Sqrt[e*Sec[c + d*x]])/(d*e^6*Sqrt[a + I*a*Tan[c + d*x]]) -
 (((16*I)/77)*a^2*Sqrt[a + I*a*Tan[c + d*x]])/(d*e^4*(e*Sec[c + d*x])^(3/2)
) - (((12*I)/77)*a*(a + I*a*Tan[c + d*x])^(3/2))/(d*e^2*(e*Sec[c + d*x])^(7
/2)) - (((2*I)/11)*(a + I*a*Tan[c + d*x])^(5/2))/(d*(e*Sec[c + d*x])^(11/2)
)
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rubi steps

$$\begin{aligned}
\int \frac{(a+ia\tan(c+dx))^{5/2}}{(e\sec(c+dx))^{11/2}}\,dx &= -\frac{2i(a+ia\tan(c+dx))^{5/2}}{11d(e\sec(c+dx))^{11/2}}+\frac{(6a)\int \frac{(a+ia\tan(c+dx))^{3/2}}{(e\sec(c+dx))^{7/2}}\,dx}{11e^2}\\
&= -\frac{12ia(a+ia\tan(c+dx))^{3/2}}{77de^2(e\sec(c+dx))^{7/2}}-\frac{2i(a+ia\tan(c+dx))^{5/2}}{11d(e\sec(c+dx))^{11/2}}+\frac{\left(24a^2\right)\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\sec(c+dx))^{3/2}}}{77e^4}\\
&= -\frac{16ia^2\sqrt{a+ia\tan(c+dx)}}{77de^4(e\sec(c+dx))^{3/2}}-\frac{12ia(a+ia\tan(c+dx))^{3/2}}{77de^2(e\sec(c+dx))^{7/2}}-\frac{2i(a+ia\tan(c+dx))^{5}}{11d(e\sec(c+dx))^{11/2}}\\
&= \frac{32ia^3\sqrt{e\sec(c+dx)}}{77de^6\sqrt{a+ia\tan(c+dx)}}-\frac{16ia^2\sqrt{a+ia\tan(c+dx)}}{77de^4(e\sec(c+dx))^{3/2}}-\frac{12ia(a+ia\tan(c+dx))^{3}}{77de^2(e\sec(c+dx))^{7/2}}
\end{aligned}$$

Mathematica [A] time = 0.74, size = 121, normalized size = 0.72

$$\frac{a^2\sqrt{a+ia\tan(c+dx)}\,(-22\sin(c+dx)+42\sin(3(c+dx))-55i\cos(c+dx)+35i\cos(3(c+dx)))(\cos(2(c+2}{154de^5(\cos(dx)+i\sin(dx))^2\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^(5/2)/(e*Sec[c + d*x])^(11/2),x]
```

```
[Out] (a^2*((-55*I)*Cos[c + d*x] + (35*I)*Cos[3*(c + d*x)] - 22*Sin[c + d*x] + 42
*Sin[3*(c + d*x)])*(Cos[2*(c + 2*d*x)] + I*Sin[2*(c + 2*d*x)])*Sqrt[a + I*a
*Tan[c + d*x]])/(154*d*e^5*Sqrt[e*Sec[c + d*x]]*(Cos[d*x] + I*Sin[d*x])^2)
```

fricas [A] time = 0.45, size = 99, normalized size = 0.59

$$\frac{\left(-7i\,a^2e^{(8i\,dx+8i\,c)}-40i\,a^2e^{(6i\,dx+6i\,c)}-110i\,a^2e^{(4i\,dx+4i\,c)}+77i\,a^2\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{308\,de^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(11/2),x, algorithm="fric
as")
```

```
[Out] 1/308*(-7*I*a^2*e^(8*I*d*x + 8*I*c) - 40*I*a^2*e^(6*I*d*x + 6*I*c) - 110*I*
a^2*e^(4*I*d*x + 4*I*c) + 77*I*a^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(
e/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(d*e^6)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(i\,a\tan(dx+c)+a)^{\frac{5}{2}}}{(e\sec(dx+c))^{\frac{11}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(11/2),x, algorithm="giac
")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(5/2)/(e*sec(d*x + c))^(11/2), x)
```

maple [A] time = 1.42, size = 132, normalized size = 0.78

$$-\frac{2\left(14i\left(\cos^5(dx+c)\right)-14\sin(dx+c)\left(\cos^4(dx+c)\right)-i\left(\cos^3(dx+c)\right)-6\left(\cos^2(dx+c)\right)\sin(dx+c)-8i}{77d\,e^{11}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(11/2),x)
```

```
[Out] -2/77/d*(14*I*cos(d*x+c)^5-14*sin(d*x+c)*cos(d*x+c)^4-I*cos(d*x+c)^3-6*cos(
d*x+c)^2*sin(d*x+c)-8*I*cos(d*x+c)-16*sin(d*x+c))*(a*(I*sin(d*x+c)+cos(d*x+
c))/cos(d*x+c))^(1/2)*(e/cos(d*x+c))^(11/2)*cos(d*x+c)^6/e^11*a^2
```

maxima [A] time = 1.11, size = 124, normalized size = 0.73

$$\frac{\left(-7i\,a^2\cos\left(\frac{11}{2}\,dx+\frac{11}{2}\,c\right)-33i\,a^2\cos\left(\frac{7}{2}\,dx+\frac{7}{2}\,c\right)-77i\,a^2\cos\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right)+77i\,a^2\cos\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+7\,a^2\sin}{308\,de^{\frac{11}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(5/2)/(e*sec(d*x+c))^(11/2),x, algorithm="maxi
ma")
```

```
[Out] 1/308*(-7*I*a^2*cos(11/2*d*x + 11/2*c) - 33*I*a^2*cos(7/2*d*x + 7/2*c) - 77
*I*a^2*cos(3/2*d*x + 3/2*c) + 77*I*a^2*cos(1/2*d*x + 1/2*c) + 7*a^2*sin(11/
2*d*x + 11/2*c) + 33*a^2*sin(7/2*d*x + 7/2*c) + 77*a^2*sin(3/2*d*x + 3/2*c)
 + 77*a^2*sin(1/2*d*x + 1/2*c))*sqrt(a)/(d*e^(11/2))
```

mupad [B] time = 6.07, size = 133, normalized size = 0.79

$$-\frac{a^2\sqrt{\frac{e}{\cos(c+d\,x)}}\,\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}\,\left(-187\,\sin\left(2\,c+2\,d\,x\right)-40\,\sin\left(4\,c+4\,d\,x\right)-7\,\sin\left(6\,c+6\,d\,x\right)+\right.}{616\,d\,e^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(5/2)/(e/cos(c + d*x))^(11/2),x)
```

```
[Out] -(a^2*(e/cos(c + d*x))^(1/2)*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i +
1))/(cos(2*c + 2*d*x) + 1))^(1/2)*(cos(2*c + 2*d*x)*33i + cos(4*c + 4*d*x)*
40i + cos(6*c + 6*d*x)*7i - 187*sin(2*c + 2*d*x) - 40*sin(4*c + 4*d*x) - 7*
sin(6*c + 6*d*x)))/(616*d*e^6)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**(5/2)/(e*sec(d*x+c))**(11/2),x)
```

```
[Out] Timed out
```

3.416 $\int \frac{(e\sec(c+dx))^{5/2}}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=369

$$\frac{ie^{5/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\sqrt{a}\,d}-\frac{ie^{5/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\sqrt{a}\,d}-\frac{ie^{5/2}\log\left(-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}+\right.}{2\sqrt{2}}$$

```
[Out] 1/2*I*e^(5/2)*arctan(1-2^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*
sec(d*x+c))^(1/2))/d*2^(1/2)/a^(1/2)-1/2*I*e^(5/2)*arctan(1+2^(1/2)*e^(1/2)
*(a+I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*sec(d*x+c))^(1/2))/d*2^(1/2)/a^(1/2)-1
/4*I*e^(5/2)*ln(a-2^(1/2)*a^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/(e*sec(d
*x+c))^(1/2)+cos(d*x+c)*(a+I*a*tan(d*x+c)))/d*2^(1/2)/a^(1/2)+1/4*I*e^(5/2)
*ln(a+2^(1/2)*a^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2)
+cos(d*x+c)*(a+I*a*tan(d*x+c)))/d*2^(1/2)/a^(1/2)-I*e^2*(e*sec(d*x+c))^(1/2
)*(a+I*a*tan(d*x+c))^(1/2)/a/d
```

Rubi [A] time = 0.31, antiderivative size = 369, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {3501, 3495, 297, 1162, 617, 204, 1165, 628}

$$\frac{ie^{5/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\sqrt{a}\,d}-\frac{ie^{5/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\sqrt{a}\,d}-\frac{ie^{2}\sqrt{a+ia\tan(c+dx)}\sqrt{e\sec(c+}}{ad}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(5/2)/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (I*e^(5/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]])/(Sqrt[a]
*Sqrt[e*Sec[c + d*x]])])/(Sqrt[2]*Sqrt[a]*d) - (I*e^(5/2)*ArcTan[1 + (Sqrt[
2]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])])/(Sq
rt[2]*Sqrt[a]*d) - ((I/2)*e^(5/2)*Log[a - (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a +
 I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a + I*a*Tan[c + d*
x])])/(Sqrt[2]*Sqrt[a]*d) + ((I/2)*e^(5/2)*Log[a + (Sqrt[2]*Sqrt[a]*Sqrt[e]
*Sqrt[a + I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a + I*a*T
an[c + d*x])])/(Sqrt[2]*Sqrt[a]*d) - (I*e^2*Sqrt[e*Sec[c + d*x]]*Sqrt[a + I
*a*Tan[c + d*x]])/(a*d)
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3495

```
Int[Sqrt[(d_.)*sec[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[(-4*b*d^2)/f, Subst[Int[x^2/(a^2 + d^2*x^4), x],
 x, Sqrt[a + b*Tan[e + f*x]]/Sqrt[d*Sec[e + f*x]]], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{5/2}}{\sqrt{a+ia\tan(c+dx)}}\,dx = -\frac{ie^2\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}}{ad} + \frac{e^2\int\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}\,d}{2a}$$

$$= -\frac{ie^2\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}}{ad} - \frac{(2ie^4)\,\text{Subst}\left(\int\frac{x^2}{a^2+e^2x^4}\,dx, x, \frac{\sqrt{a+ia\tan(c+d}}{\sqrt{e\sec(c+dx)}}\right.}{d}$$

$$= -\frac{ie^2\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}}{ad} + \frac{(ie^3)\,\text{Subst}\left(\int\frac{a-ex^2}{a^2+e^2x^4}\,dx, x, \frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\right.}{d}$$

$$= -\frac{ie^2\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}}{ad} - \frac{(ie^2)\,\text{Subst}\left(\int\frac{1}{\frac{a}{e}-\frac{\sqrt{2}\sqrt{a}x}{\sqrt{e}}+x^2}\,dx, x, \frac{\sqrt{a+ia\tan}}{\sqrt{e\sec(c}}\right.}{2d}$$

$$= -\frac{ie^{5/2}\log\left(a-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}+\cos(c+dx)(a+ia\tan(c+dx))\right)}{2\sqrt{2}\sqrt{a}\,d} + \frac{ie^{5/2}\log\left(\right.}{}$$

$$= \frac{ie^{5/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\sqrt{a}\,d} - \frac{ie^{5/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\sqrt{a}\,d} - \frac{ie^{5/2}\,\text{lo}}{}$$

Mathematica [A] time = 3.70, size = 350, normalized size = 0.95

$$\frac{e^3(\tan(c+dx)-i)\left(-i\sqrt{-\sin(c)-i\cos(c)-1}\,\sqrt{-\sin(c)+i\cos(c)+1}\,\sqrt{\tan\left(\frac{dx}{2}\right)+i}\,\tanh^{-1}\left(\frac{\sqrt{\sin(c)-i\cos(c)+1}\,\sqrt{}}{\sqrt{-\sin(c)-i\cos(c)-1}}\right.\right.}{d\sqrt{i\sin(2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(5/2)/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (e^3*(Sec[c + d*x]*Sqrt[1 + Cos[2*c] + I*Sin[2*c]]*Sqrt[I - Tan[(d*x)/2]] -
 I*ArcTanh[(Sqrt[1 - I*Cos[c] + Sin[c]]*Sqrt[I - Tan[(d*x)/2]])/(Sqrt[-1 -
I*Cos[c] - Sin[c]]*Sqrt[I + Tan[(d*x)/2]])]*Sqrt[-1 - I*Cos[c] - Sin[c]]*Sq
rt[1 + I*Cos[c] - Sin[c]]*Sqrt[I + Tan[(d*x)/2]] + I*ArcTanh[(Sqrt[1 + I*Co
s[c] - Sin[c]]*Sqrt[I - Tan[(d*x)/2]])/(Sqrt[-1 + I*Cos[c] + Sin[c]]*Sqrt[I
 + Tan[(d*x)/2]])]*Sqrt[1 - I*Cos[c] + Sin[c]]*Sqrt[-1 + I*Cos[c] + Sin[c]]
*Sqrt[I + Tan[(d*x)/2]])*(-I + Tan[c + d*x]))/(d*Sqrt[e*Sec[c + d*x]]*Sqrt[
1 + Cos[2*c] + I*Sin[2*c]]*Sqrt[I - Tan[(d*x)/2]]*Sqrt[a + I*a*Tan[c + d*x]
])
```

fricas [A] time = 0.82, size = 461, normalized size = 1.25

$$\frac{-4i\,e^2\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\,\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{3}{2}i\,dx+\frac{3}{2}i\,c\right)}+\sqrt{\frac{i\,e^5}{ad^2}}\,ad\log\left(\frac{2\left(\left(e^2e^{(2i\,dx+2i\,c)}+e^2\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\,\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+\sqrt{}\right.}{e^2}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="frica
s")
```

```
[Out] 1/2*(-4*I*e^2*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c)
 + 1))*e^(3/2*I*d*x + 3/2*I*c) + sqrt(I*e^5/(a*d^2))*a*d*log(2*((e^2*e^(2*I
*d*x + 2*I*c) + e^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x +
 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + sqrt(I*e^5/(a*d^2))*a*d)/e^2) - sqr
t(I*e^5/(a*d^2))*a*d*log(2*((e^2*e^(2*I*d*x + 2*I*c) + e^2)*sqrt(a/(e^(2*I*
d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c
) - sqrt(I*e^5/(a*d^2))*a*d)/e^2) - sqrt(-I*e^5/(a*d^2))*a*d*log(2*((e^2*e^
(2*I*d*x + 2*I*c) + e^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d
*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) + sqrt(-I*e^5/(a*d^2))*a*d)/e^2)
+ sqrt(-I*e^5/(a*d^2))*a*d*log(2*((e^2*e^(2*I*d*x + 2*I*c) + e^2)*sqrt(a/(e
^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1
/2*I*c) - sqrt(-I*e^5/(a*d^2))*a*d)/e^2))/(a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{5}{2}}}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] integrate((e*sec(d*x + c))^(5/2)/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [A] time = 1.33, size = 316, normalized size = 0.86

$$-\frac{\left(\frac{e}{\cos(dx+c)}\right)^{\frac{5}{2}}\left(\cos^{2}(dx+c)\right)\left(-1+\cos(dx+c)\right)^{3}\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(i\cos(dx+c)\operatorname{arctanh}\left(\frac{\sqrt{\frac{1}{1+\cos(dx+c)}}\,(\cos(d}{2}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] -1/2/d*(e/cos(d*x+c))^(5/2)*cos(d*x+c)^2*(-1+cos(d*x+c))^3*(a*(I*sin(d*x+c)
+cos(d*x+c))/cos(d*x+c))^(1/2)*(I*cos(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))
^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))-I*cos(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)
))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))+2*I*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)
-cos(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))
-cos(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))
+2*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)+2*(1/(1+cos(d*x+c)))^(1/2))/sin(d*x+
c)^5/(I*sin(d*x+c)+cos(d*x+c)-1)/(1/(1+cos(d*x+c)))^(5/2)/a
```

maxima [B] time = 0.97, size = 2273, normalized size = 6.16

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxim
a")
```

```
[Out] -(128*e^2*cos(3/2*d*x + 3/2*c) + 128*I*e^2*sin(3/2*d*x + 3/2*c) + (16*sqrt(
2)*e^2*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 16*I*
sqrt(2)*e^2*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) +
16*sqrt(2)*e^2)*arctan2(sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3
/2*d*x + 3/2*c))) + 1, sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/
2*d*x + 3/2*c))) + 1) + (16*sqrt(2)*e^2*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c
), cos(3/2*d*x + 3/2*c))) + 16*I*sqrt(2)*e^2*sin(4/3*arctan2(sin(3/2*d*x +
3/2*c), cos(3/2*d*x + 3/2*c))) + 16*sqrt(2)*e^2)*arctan2(sqrt(2)*cos(1/3*ar
ctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1, -sqrt(2)*sin(1/3*ar
ctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) + (16*sqrt(2)*e^2*c
os(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 16*I*sqrt(2)*
e^2*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 16*sqrt(
2)*e^2)*arctan2(sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x +
 3/2*c))) - 1, sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x +
3/2*c))) + 1) + (16*sqrt(2)*e^2*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3
/2*d*x + 3/2*c))) + 16*I*sqrt(2)*e^2*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c),
cos(3/2*d*x + 3/2*c))) + 16*sqrt(2)*e^2)*arctan2(sqrt(2)*cos(1/3*arctan2(si
n(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 1, -sqrt(2)*sin(1/3*arctan2(si
n(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) - (16*I*sqrt(2)*e^2*cos(4/3
*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 16*sqrt(2)*e^2*sin(
4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 16*I*sqrt(2)*e^2
)*arctan2(sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c
))) + sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))), sqrt(2)
*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + cos(2/3*arc
tan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) - (-16*I*sqrt(2)*e^2
*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 16*sqrt(2)*
e^2*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 16*I*sqr
t(2)*e^2)*arctan2(-sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*
x + 3/2*c))) + sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))
, -sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + c
```

```
os(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) - (8*sqrt(
2)*e^2*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 8*I*s
qrt(2)*e^2*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 8
*sqrt(2)*e^2)*log(2*sqrt(2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d
*x + 3/2*c)))*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))
+ 2*(sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) +
 1)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + cos(2/3*
arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*cos(1/3*arctan2(
sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + sin(2/3*arctan2(sin(3/2*d*
x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*
c), cos(3/2*d*x + 3/2*c)))^2 + 2*sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*
c), cos(3/2*d*x + 3/2*c))) + 1) + (8*sqrt(2)*e^2*cos(4/3*arctan2(sin(3/2*d*
x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 8*I*sqrt(2)*e^2*sin(4/3*arctan2(sin(3/
2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 8*sqrt(2)*e^2)*log(-2*sqrt(2)*sin(
2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))*sin(1/3*arctan2(si
n(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 2*(sqrt(2)*cos(1/3*arctan2(sin
(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 1)*cos(2/3*arctan2(sin(3/2*d*x
+ 3/2*c), cos(3/2*d*x + 3/2*c))) + cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), co
s(3/2*d*x + 3/2*c)))^2 + 2*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*
x + 3/2*c)))^2 + sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)
))^2 + 2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 - 2
*sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1)
- (-8*I*sqrt(2)*e^2*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2
*c))) + 8*sqrt(2)*e^2*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3
/2*c))) - 8*I*sqrt(2)*e^2)*log(2*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(
3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x
+ 3/2*c)))^2 + 2*sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x
+ 3/2*c))) + 2*sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x +
3/2*c))) + 2) - (8*I*sqrt(2)*e^2*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(
3/2*d*x + 3/2*c))) - 8*sqrt(2)*e^2*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), co
s(3/2*d*x + 3/2*c))) + 8*I*sqrt(2)*e^2)*log(2*cos(1/3*arctan2(sin(3/2*d*x +
 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c),
 cos(3/2*d*x + 3/2*c)))^2 + 2*sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c),
 cos(3/2*d*x + 3/2*c))) - 2*sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), c
os(3/2*d*x + 3/2*c))) + 2) - (-8*I*sqrt(2)*e^2*cos(4/3*arctan2(sin(3/2*d*x
+ 3/2*c), cos(3/2*d*x + 3/2*c))) + 8*sqrt(2)*e^2*sin(4/3*arctan2(sin(3/2*d*
x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 8*I*sqrt(2)*e^2)*log(2*cos(1/3*arctan2
(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2(sin(3/2
*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 - 2*sqrt(2)*cos(1/3*arctan2(sin(3/2
*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2*sqrt(2)*sin(1/3*arctan2(sin(3/2*d
*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2) - (8*I*sqrt(2)*e^2*cos(4/3*arctan2
(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 8*sqrt(2)*e^2*sin(4/3*arcta
n2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 8*I*sqrt(2)*e^2)*log(2*co
s(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*ar
ctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 - 2*sqrt(2)*cos(1/3*ar
ctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 2*sqrt(2)*sin(1/3*arct
an2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2))*sqrt(a)*sqrt(e)/((-6
4*I*a*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 64*a*s
in(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 64*I*a)*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{5/2}}{\sqrt{a+a\tan\left(c+d\,x\right)\,1\mathrm{i}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(5/2)/(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] int((e/cos(c + d*x))^(5/2)/(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(5/2)/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

3.417 $\int \frac{(e\sec(c+dx))^{3/2}}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=483

$$-\frac{i\sqrt{2}\sqrt{a}e^{3/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}+\frac{i\sqrt{2}\sqrt{a}e^{3/2}\sec(c+dx)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] 1/2*I*e^(3/2)*ln(a-2^(1/2)*a^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/(e*sec(
d*x+c))^(1/2)+cos(d*x+c)*(a-I*a*tan(d*x+c)))*sec(d*x+c)*a^(1/2)/d*2^(1/2)/(
a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)-1/2*I*e^(3/2)*ln(a+2^(1/2)
*a^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2)+cos(d*x+c)*(
a-I*a*tan(d*x+c)))*sec(d*x+c)*a^(1/2)/d*2^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a
+I*a*tan(d*x+c))^(1/2)-I*e^(3/2)*arctan(1-2^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c)
)^(1/2)/a^(1/2)/(e*sec(d*x+c))^(1/2))*sec(d*x+c)*2^(1/2)*a^(1/2)/d/(a-I*a*t
an(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)+I*e^(3/2)*arctan(1+2^(1/2)*e^(1/2
)*(a-I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*sec(d*x+c))^(1/2))*sec(d*x+c)*2^(1/2)
*a^(1/2)/d/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)
```

Rubi [A] time = 0.35, antiderivative size = 483, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {3499, 3495, 297, 1162, 617, 204, 1165, 628}

$$-\frac{i\sqrt{2}\sqrt{a}e^{3/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}+\frac{i\sqrt{2}\sqrt{a}e^{3/2}\sec(c+dx)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(3/2)/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((-I)*Sqrt[2]*Sqrt[a]*e^(3/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e]*Sqrt[a - I*a*Tan[
c + d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])]*Sec[c + d*x])/(d*Sqrt[a - I*a*Ta
n[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) + (I*Sqrt[2]*Sqrt[a]*e^(3/2)*ArcTan
[1 + (Sqrt[2]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d
*x]])]*Sec[c + d*x])/(d*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x
]]) + (I*Sqrt[a]*e^(3/2)*Log[a - (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a - I*a*Tan[
c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a - I*a*Tan[c + d*x])]*Sec[
c + d*x])/(Sqrt[2]*d*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]])
 - (I*Sqrt[a]*e^(3/2)*Log[a + (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a - I*a*Tan[c +
 d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a - I*a*Tan[c + d*x])]*Sec[c +
 d*x])/(Sqrt[2]*d*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3495

```
Int[Sqrt[(d_.)*sec[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[(-4*b*d^2)/f, Subst[Int[x^2/(a^2 + d^2*x^4), x],
 x, Sqrt[a + b*Tan[e + f*x]]/Sqrt[d*Sec[e + f*x]]], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3499

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(3/2)/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_
.)*(x_)]], x_Symbol] :> Dist[(d*Sec[e + f*x])/(Sqrt[a - b*Tan[e + f*x]]*Sqr
t[a + b*Tan[e + f*x]]), Int[Sqrt[d*Sec[e + f*x]]*Sqrt[a - b*Tan[e + f*x]],
x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{3/2}}{\sqrt{a+ia\tan(c+dx)}}dx = \frac{(e\sec(c+dx))\int \sqrt{e\sec(c+dx)}\sqrt{a-ia\tan(c+dx)}\,dx}{\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}$$
$$= \frac{\left(4iae^3\sec(c+dx)\right)\operatorname{Subst}\left(\int \frac{x^2}{a^2+e^2x^4}dx, x, \frac{\sqrt{a-ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\right)}{d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}$$
$$= -\frac{\left(2iae^2\sec(c+dx)\right)\operatorname{Subst}\left(\int \frac{a-ex^2}{a^2+e^2x^4}dx, x, \frac{\sqrt{a-ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\right)}{d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}} + \frac{\left(2iae^2\sec(c+dx)\right)}{d\sqrt{a-ia\tan}}$$
$$= \frac{(iae\sec(c+dx))\operatorname{Subst}\left(\int \frac{1}{\frac{a}{e}-\frac{\sqrt{2}\sqrt{a}x}{\sqrt{e}}+x^2}dx, x, \frac{\sqrt{a-ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\right)}{d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}} + \frac{(iae\sec(c+dx))\operatorname{S}}{d\sqrt{a-ia}}$$
$$= \frac{i\sqrt{a}e^{3/2}\log\left(a-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}+\cos(c+dx)(a-ia\tan(c+dx))\right)\sec(c+}{\sqrt{2}d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}$$
$$= -\frac{i\sqrt{2}\sqrt{a}e^{3/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)\sec(c+dx)}{d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}} + \frac{i\sqrt{2}\sqrt{a}e^{3/2}\tan^{-1}\left(1+\right.}{d\sqrt{a-ia\tan(c}}$$

Mathematica [A] time = 1.30, size = 302, normalized size = 0.63

$$\frac{2e\sqrt{\tan\left(\frac{dx}{2}\right)+i}(\cos(dx)+i\sin(dx))\sqrt{e\sec(c+dx)}\left(\sqrt{-\sin(c)-i\cos(c)-1}\sqrt{-\sin(c)+i\cos(c)+1}\tanh^{-1}\right.}{d\sqrt{-\sin(c)-i\cos(c)-1}\sqrt{\sin(c)+i\operatorname{co}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(3/2)/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (2*e*Sqrt[e*Sec[c + d*x]]*(ArcTanh[(Sqrt[1 + I*Cos[c] - Sin[c]]*Sqrt[I - Ta
n[(d*x)/2]])/(Sqrt[-1 + I*Cos[c] + Sin[c]]*Sqrt[I + Tan[(d*x)/2]])]*Sqrt[-1
 - I*Cos[c] - Sin[c]]*Sqrt[1 + I*Cos[c] - Sin[c]] - ArcTanh[(Sqrt[1 - I*Cos
[c] + Sin[c]]*Sqrt[I - Tan[(d*x)/2]])/(Sqrt[-1 - I*Cos[c] - Sin[c]]*Sqrt[I
+ Tan[(d*x)/2]])]*Sqrt[1 - I*Cos[c] + Sin[c]]*Sqrt[-1 + I*Cos[c] + Sin[c]])
*(Cos[d*x] + I*Sin[d*x])*Sqrt[I + Tan[(d*x)/2]])/(d*Sqrt[-1 - I*Cos[c] - Si
n[c]]*Sqrt[-1 + I*Cos[c] + Sin[c]]*Sqrt[I - Tan[(d*x)/2]]*Sqrt[a + I*a*Tan[
c + d*x]])
```

fricas [A] time = 1.24, size = 385, normalized size = 0.80

$$\frac{1}{2}\sqrt{\frac{4ie^3}{ad^2}}\log\left(\frac{2\left(ee^{(2idx+2ic)}+e\right)\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}e^{\left(\frac{1}{2}idx+\frac{1}{2}ic\right)}+iad\sqrt{\frac{4ie^3}{ad^2}}}{e}\right)-\frac{1}{2}\sqrt{\frac{4ie^3}{ad^2}}\log\left(\frac{2\left(ee^{(2idx-}\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="frica
s")
```

```
[Out] 1/2*sqrt(4*I*e^3/(a*d^2))*log((2*(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I
*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*
c) + I*a*d*sqrt(4*I*e^3/(a*d^2)))/e) - 1/2*sqrt(4*I*e^3/(a*d^2))*log((2*(e*
```

```
e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d
*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) - I*a*d*sqrt(4*I*e^3/(a*d^2)))/e)
 + 1/2*sqrt(-4*I*e^3/(a*d^2))*log((2*(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^
(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/
2*I*c) + I*a*d*sqrt(-4*I*e^3/(a*d^2)))/e) - 1/2*sqrt(-4*I*e^3/(a*d^2))*log(
(2*(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^
(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) - I*a*d*sqrt(-4*I*e^3/(a*d^
2)))/e)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{3}{2}}}{\sqrt{ia\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] integrate((e*sec(d*x + c))^(3/2)/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [A] time = 1.25, size = 232, normalized size = 0.48

$$\frac{\left(\frac{e}{\cos(dx+c)}\right)^{\frac{3}{2}}\left(\cos^2(dx+c)\right)\left(-1+\cos(dx+c)\right)^2\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(i\operatorname{arctanh}\left(\frac{\sqrt{\frac{1}{1+\cos(dx+c)}}\,(\cos(dx+c)+1+\sin(dx+c)}{2}\right.\right.}{d\sin(dx+c)^3\left(\frac{}{1+c}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 1/d*(e/cos(d*x+c))^(3/2)*cos(d*x+c)^2*(-1+cos(d*x+c))^2*(a*(I*sin(d*x+c)+co
s(d*x+c))/cos(d*x+c))^(1/2)*(I*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*
x+c)+1+sin(d*x+c)))-I*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-si
n(d*x+c)))+arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+
arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c))))/sin(d*x+c)
^3/(1/(1+cos(d*x+c)))^(3/2)/(I*sin(d*x+c)+cos(d*x+c)-1)/a
```

maxima [A] time = 1.05, size = 726, normalized size = 1.50

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxim
a")
```

```
[Out] -1/4*(2*I*sqrt(2)*e*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c) + 1, sqrt(2)*sin(1
/2*d*x + 1/2*c) + 1) + 2*I*sqrt(2)*e*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c) +
 1, -sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) + 2*I*sqrt(2)*e*arctan2(sqrt(2)*cos(
1/2*d*x + 1/2*c) - 1, sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) + 2*I*sqrt(2)*e*arc
tan2(sqrt(2)*cos(1/2*d*x + 1/2*c) - 1, -sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) -
 2*sqrt(2)*e*arctan2(sqrt(2)*sin(1/2*d*x + 1/2*c) + sin(d*x + c), sqrt(2)*c
os(1/2*d*x + 1/2*c) + cos(d*x + c) + 1) + 2*sqrt(2)*e*arctan2(-sqrt(2)*sin(
1/2*d*x + 1/2*c) + sin(d*x + c), -sqrt(2)*cos(1/2*d*x + 1/2*c) + cos(d*x +
c) + 1) + I*sqrt(2)*e*log(2*sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + 2*(
sqrt(2)*cos(1/2*d*x + 1/2*c) + 1)*cos(d*x + c) + cos(d*x + c)^2 + 2*cos(1/2
*d*x + 1/2*c)^2 + sin(d*x + c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) + 1) - I*sqrt(2)*e*log(-2*sqrt(2)*sin(d*x + c)*sin(1/2*d*
```

```
x + 1/2*c) - 2*(sqrt(2)*cos(1/2*d*x + 1/2*c) - 1)*cos(d*x + c) + cos(d*x +
c)^2 + 2*cos(1/2*d*x + 1/2*c)^2 + sin(d*x + c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 1) - sqrt(2)*e*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*e*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*si
n(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d
*x + 1/2*c) + 2) - sqrt(2)*e*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x +
 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c)
 + 2) + sqrt(2)*e*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 -
 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sqrt
(e)/(sqrt(a)*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{3/2}}{\sqrt{a+a\tan\left(c+d\,x\right)\,1\mathrm{i}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(3/2)/(a + a*tan(c + d*x)*1i)^(1/2),x)
[Out] int((e/cos(c + d*x))^(3/2)/(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(c+dx))^{\frac{3}{2}}}{\sqrt{ia(\tan(c+dx)-i)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(3/2)/(a+I*a*tan(d*x+c))**(1/2),x)
[Out] Integral((e*sec(c + d*x))**(3/2)/sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.418 $\int \frac{\sqrt{e\sec(c+dx)}}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=36

$$\frac{2i\sqrt{e\sec(c+dx)}}{d\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] 2*I*(e*sec(d*x+c))^(1/2)/d/(a+I*a*tan(d*x+c))^(1/2)
```

Rubi [A] time = 0.07, antiderivative size = 36, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.033, Rules used = {3488}

$$\frac{2i\sqrt{e\sec(c+dx)}}{d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Sec[c + d*x]]/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((2*I)*Sqrt[e*Sec[c + d*x]])/(d*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rubi steps

$$\int \frac{\sqrt{e\sec(c+dx)}}{\sqrt{a+ia\tan(c+dx)}}\,dx = \frac{2i\sqrt{e\sec(c+dx)}}{d\sqrt{a+ia\tan(c+dx)}}$$

Mathematica [A] time = 0.07, size = 36, normalized size = 1.00

$$\frac{2i\sqrt{e\sec(c+dx)}}{d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Sec[c + d*x]]/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((2*I)*Sqrt[e*Sec[c + d*x]])/(d*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [B] time = 0.42, size = 64, normalized size = 1.78

$$\frac{2\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(i\,e^{(2i\,dx+2i\,c)}+i\right)e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="frica
s")
```

```
[Out] 2*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(I*e^
(2*I*d*x + 2*I*c) + I)*e^(-1/2*I*d*x - 1/2*I*c)/(a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\sec(dx+c)}}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] integrate(sqrt(e*sec(d*x + c))/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [B] time = 1.16, size = 72, normalized size = 2.00

$$\frac{2i\cos(dx+c)\sqrt{\frac{e}{\cos(dx+c)}}\,\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\,(-i\sin(dx+c)+\cos(dx+c))}{da}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 2*I/d*cos(d*x+c)*(e/cos(d*x+c))^(1/2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+
c))^(1/2)*(-I*sin(d*x+c)+cos(d*x+c))/a
```

maxima [B] time = 0.67, size = 76, normalized size = 2.11

$$\frac{2i\sqrt{e}\sqrt{-\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-1}}{\sqrt{a}\,d\sqrt{-\frac{2i\sin(dx+c)}{\cos(dx+c)+1}+\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxim
a")
```

```
[Out] 2*I*sqrt(e)*sqrt(-sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 1)/(sqrt(a)*d*sqrt(
-2*I*sin(d*x + c)/(cos(d*x + c) + 1) + sin(d*x + c)^2/(cos(d*x + c) + 1)^2
- 1))
```

mupad [B] time = 4.31, size = 40, normalized size = 1.11

$$\frac{\sqrt{\frac{e}{\cos(c+d\,x)}}\,2\mathrm{i}}{d\sqrt{a+\frac{a\sin(c+d\,x)\,1\mathrm{i}}{\cos(c+d\,x)}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(1/2)/(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] ((e/cos(c + d*x))^(1/2)*2i)/(d*(a + (a*sin(c + d*x)*1i)/cos(c + d*x))^(1/2)
)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\sec(c+dx)}}{\sqrt{ia(\tan(c+dx)-i)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(1/2)/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(e*sec(c + d*x))/sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.419 $\int \frac{1}{\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=80

$$\frac{2i}{3d\sqrt{a+ia\tan(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{4i\sqrt{a+ia\tan(c+dx)}}{3ad\sqrt{e\sec(c+dx)}}$$

```
[Out] 2/3*I/d/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)-4/3*I*(a+I*a*tan(d*x+
c))^(1/2)/a/d/(e*sec(d*x+c))^(1/2)
```

Rubi [A] time = 0.14, antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {3502, 3488}

$$\frac{2i}{3d\sqrt{a+ia\tan(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{4i\sqrt{a+ia\tan(c+dx)}}{3ad\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[e*Sec[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]),x]
```

```
[Out] ((2*I)/3)/(d*Sqrt[e*Sec[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) - (((4*I)/3)*
Sqrt[a + I*a*Tan[c + d*x]])/(a*d*Sqrt[e*Sec[c + d*x]])
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}}\,dx &= \frac{2i}{3d\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}}+\frac{2\int \frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\,dx}{3a}\\ &= \frac{2i}{3d\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}}-\frac{4i\sqrt{a+ia\tan(c+dx)}}{3ad\sqrt{e\sec(c+dx)}}\end{aligned}$$

Mathematica [A] time = 0.12, size = 48, normalized size = 0.60

$$\frac{4\tan(c+dx)-2i}{3d\sqrt{a+ia\tan(c+dx)}\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[e*Sec[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]),x]
```

```
[Out] (-2*I + 4*Tan[c + d*x])/(3*d*Sqrt[e*Sec[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]
])
```

fricas [A] time = 1.12, size = 78, normalized size = 0.98

$$\frac{\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(-3i\,e^{(4i\,dx+4i\,c)}-2i\,e^{(2i\,dx+2i\,c)}+i\right)e^{\left(-\frac{3}{2}i\,dx-\frac{3}{2}i\,c\right)}}{3\,ade}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fri
cas")
```

```
[Out] 1/3*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(-3
*I*e^(4*I*d*x + 4*I*c) - 2*I*e^(2*I*d*x + 2*I*c) + I)*e^(-3/2*I*d*x - 3/2*I
*c)/(a*d*e)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{e\sec\left(dx+c\right)}\sqrt{i\,a\tan\left(dx+c\right)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="gia
c")
```

```
[Out] integrate(1/(sqrt(e*sec(d*x + c))*sqrt(I*a*tan(d*x + c) + a)), x)
```

maple [A] time = 1.16, size = 85, normalized size = 1.06

$$-\frac{2\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(i\cos\left(dx+c\right)-2\sin\left(dx+c\right)\right)}{3d\left(i\sin\left(dx+c\right)+\cos\left(dx+c\right)\right)\sqrt{\frac{e}{\cos(dx+c)}}\;a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] -2/3/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(I*cos(d*x+c)-2*sin(d
*x+c))/(I*sin(d*x+c)+cos(d*x+c))/(e/cos(d*x+c))^(1/2)/a
```

maxima [A] time = 1.02, size = 80, normalized size = 1.00

$$\frac{i\cos\left(\frac{3}{2}dx+\frac{3}{2}c\right)-3i\cos\left(\frac{1}{3}\arctan\left(\sin\left(\frac{3}{2}dx+\frac{3}{2}c\right),\cos\left(\frac{3}{2}dx+\frac{3}{2}c\right)\right)\right)+\sin\left(\frac{3}{2}dx+\frac{3}{2}c\right)+3\sin\left(\frac{1}{3}\text{arcta}\right.}{3\sqrt{a}d\sqrt{e}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="max
ima")
```

```
[Out] 1/3*(I*cos(3/2*d*x + 3/2*c) - 3*I*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos
(3/2*d*x + 3/2*c))) + sin(3/2*d*x + 3/2*c) + 3*sin(1/3*arctan2(sin(3/2*d*x
+ 3/2*c), cos(3/2*d*x + 3/2*c))))/(sqrt(a)*d*sqrt(e))
```

mupad [B] time = 0.78, size = 78, normalized size = 0.98

$$-\frac{2\sqrt{\frac{e}{\cos(c+d\,x)}}\;\left(-2\,\sin\left(c+d\,x\right)+\cos\left(c+d\,x\right)\,1\mathrm{i}\right)}{3\,d\,e\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^(1/2)),x)
```

```
[Out] -(2*(e/cos(c + d*x))^(1/2)*(cos(c + d*x)*1i - 2*sin(c + d*x)))/(3*d*e*((a*(
cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1))^(1/2))
```

sympy [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{e \sec{(c + dx)}}\sqrt{ia(\tan{(c + dx)} - i)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))**(1/2)/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(1/(sqrt(e*sec(c + d*x))*sqrt(I*a*(tan(c + d*x) - I))), x)
```

3.420 $\int \frac{1}{(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=121

$$\frac{16i\sqrt{e\sec(c+dx)}}{15de^2\sqrt{a+ia\tan(c+dx)}}-\frac{8i\sqrt{a+ia\tan(c+dx)}}{15ad(e\sec(c+dx))^{3/2}}+\frac{2i}{5d\sqrt{a+ia\tan(c+dx)}\,(e\sec(c+dx))^{3/2}}$$

```
[Out] 2/5*I/d/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2)+16/15*I*(e*sec(d*x+c)
)^(1/2)/d/e^2/(a+I*a*tan(d*x+c))^(1/2)-8/15*I*(a+I*a*tan(d*x+c))^(1/2)/a/d/
(e*sec(d*x+c))^(3/2)
```

Rubi [A] time = 0.22, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {3502, 3497, 3488}

$$\frac{16i\sqrt{e\sec(c+dx)}}{15de^2\sqrt{a+ia\tan(c+dx)}}-\frac{8i\sqrt{a+ia\tan(c+dx)}}{15ad(e\sec(c+dx))^{3/2}}+\frac{2i}{5d\sqrt{a+ia\tan(c+dx)}\,(e\sec(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Sec[c + d*x])^(3/2)*Sqrt[a + I*a*Tan[c + d*x]]),x]
```

```
[Out] ((2*I)/5)/(d*(e*Sec[c + d*x])^(3/2)*Sqrt[a + I*a*Tan[c + d*x]]) + (((16*I)/
15)*Sqrt[e*Sec[c + d*x]])/(d*e^2*Sqrt[a + I*a*Tan[c + d*x]]) - (((8*I)/15)*
Sqrt[a + I*a*Tan[c + d*x]])/(a*d*(e*Sec[c + d*x])^(3/2))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{1}{(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}}\,dx = \frac{2i}{5d(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}} + \frac{4\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\sec(c+dx))^{3/2}}\,dx}{5a}$$

$$= \frac{2i}{5d(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}} - \frac{8i\sqrt{a+ia\tan(c+dx)}}{15ad(e\sec(c+dx))^{3/2}} +$$

$$= \frac{2i}{5d(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}} + \frac{16i\sqrt{e\sec(c+dx)}}{15de^2\sqrt{a+ia\tan(c+dx}}$$

Mathematica [A] time = 0.27, size = 68, normalized size = 0.56

$$-\frac{i\sec^2(c+dx)(4i\sin(2(c+dx))+\cos(2(c+dx))-15)}{15d\sqrt{a+ia\tan(c+dx)}\,(e\sec(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Sec[c + d*x])^(3/2)*Sqrt[a + I*a*Tan[c + d*x]]),x]
```

```
[Out] ((-1/15*I)*Sec[c + d*x]^2*(-15 + Cos[2*(c + d*x)] + (4*I)*Sin[2*(c + d*x)])
)/(d*(e*Sec[c + d*x])^(3/2)*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.80, size = 89, normalized size = 0.74

$$\frac{\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(-5i\,e^{(6i\,dx+6i\,c)}+25i\,e^{(4i\,dx+4i\,c)}+33i\,e^{(2i\,dx+2i\,c)}+3i\right)e^{\left(-\frac{5}{2}i\,dx-\frac{5}{2}i\,c\right)}}{30\,ade^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fri
cas")
```

```
[Out] 1/30*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(-
5*I*e^(6*I*d*x + 6*I*c) + 25*I*e^(4*I*d*x + 4*I*c) + 33*I*e^(2*I*d*x + 2*I*
c) + 3*I)*e^(-5/2*I*d*x - 5/2*I*c)/(a*d*e^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\sec(dx+c))^{\frac{3}{2}}\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="gia
c")
```

```
[Out] integrate(1/((e*sec(d*x + c))^(3/2)*sqrt(I*a*tan(d*x + c) + a)), x)
```

maple [A] time = 1.17, size = 105, normalized size = 0.87

$$\frac{2\left(\cos^2(dx+c)\right)\left(\frac{e}{\cos(dx+c)}\right)^{\frac{3}{2}}\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(3i\left(\cos^3(dx+c)\right)+3\left(\cos^2(dx+c)\right)\sin(dx+c)+4i\cos(d\right.}{15d\,e^3a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2),x)
```

[Out] 2/15/d*cos(d*x+c)^2*(e/cos(d*x+c))^(3/2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(3*I*cos(d*x+c)^3+3*cos(d*x+c)^2*sin(d*x+c)+4*I*cos(d*x+c)+8*sin(d*x+c))/e^3/a

maxima [A] time = 0.86, size = 130, normalized size = 1.07

$$3i\cos\left(\frac{5}{2}dx+\frac{5}{2}c\right)-5i\cos\left(\frac{3}{5}\arctan\left(\sin\left(\frac{5}{2}dx+\frac{5}{2}c\right),\cos\left(\frac{5}{2}dx+\frac{5}{2}c\right)\right)\right)+30i\cos\left(\frac{1}{5}\arctan\left(\sin\left(\frac{5}{2}dx+\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")

[Out] 1/30*(3*I*cos(5/2*d*x + 5/2*c) - 5*I*cos(3/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 30*I*cos(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 3*sin(5/2*d*x + 5/2*c) + 5*sin(3/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 30*sin(1/5*arctan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))))/(sqrt(a)*d*e^(3/2))

mupad [B] time = 4.03, size = 86, normalized size = 0.71

$$\frac{\sqrt{\frac{e}{\cos(c+d\,x)}}\,\left(4\,\sin\left(2\,c+2\,d\,x\right)-\cos\left(2\,c+2\,d\,x\right)\,1{}\mathrm{i}+15{}\mathrm{i}\right)}{15\,d\,e^2\,\sqrt{\frac{a\,\left(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1{}\mathrm{i}\right)}{\cos(2\,c+2\,d\,x)+1}}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^(1/2)),x)

[Out] ((e/cos(c + d*x))^(1/2)*(4*sin(2*c + 2*d*x) - cos(2*c + 2*d*x)*1i + 15i))/(15*d*e^2*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1))^(1/2))

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{1}{\left(e\sec\left(c+dx\right)\right)^{\frac{3}{2}}\sqrt{ia\left(\tan\left(c+dx\right)-i\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(e*sec(d*x+c))**(3/2)/(a+I*a*tan(d*x+c))**(1/2),x)

[Out] Integral(1/((e*sec(c + d*x))**(3/2)*sqrt(I*a*(tan(c + d*x) - I))), x)

3.421 $\int \frac{1}{(e\sec(c+dx))^{5/2}\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=165

$$-\frac{32i\sqrt{a+ia\tan(c+dx)}}{35ade^2\sqrt{e\sec(c+dx)}}+\frac{16i}{35de^2\sqrt{a+ia\tan(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{12i\sqrt{a+ia\tan(c+dx)}}{35ad(e\sec(c+dx))^{5/2}}+\frac{}{7d\sqrt{a+ia\tan(c+}}$$

```
[Out] 2/7*I/d/(e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(1/2)+16/35*I/d/e^2/(e*sec(
d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)-12/35*I*(a+I*a*tan(d*x+c))^(1/2)/a/d
/(e*sec(d*x+c))^(5/2)-32/35*I*(a+I*a*tan(d*x+c))^(1/2)/a/d/e^2/(e*sec(d*x+c
))^(1/2)
```

Rubi [A] time = 0.29, antiderivative size = 165, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {3502, 3497, 3488}

$$-\frac{32i\sqrt{a+ia\tan(c+dx)}}{35ade^2\sqrt{e\sec(c+dx)}}+\frac{16i}{35de^2\sqrt{a+ia\tan(c+dx)}\sqrt{e\sec(c+dx)}}-\frac{12i\sqrt{a+ia\tan(c+dx)}}{35ad(e\sec(c+dx))^{5/2}}+\frac{}{7d\sqrt{a+ia\tan(c+}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Sec[c + d*x])^(5/2)*Sqrt[a + I*a*Tan[c + d*x]]),x]
```

```
[Out] ((2*I)/7)/(d*(e*Sec[c + d*x])^(5/2)*Sqrt[a + I*a*Tan[c + d*x]]) + ((16*I)/3
5)/(d*e^2*Sqrt[e*Sec[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) - (((12*I)/35)*S
qrt[a + I*a*Tan[c + d*x]])/(a*d*(e*Sec[c + d*x])^(5/2)) - (((32*I)/35)*Sqrt
[a + I*a*Tan[c + d*x]])/(a*d*e^2*Sqrt[e*Sec[c + d*x]])
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{1}{(e\sec(c+dx))^{5/2}\sqrt{a+ia\tan(c+dx)}}\,dx = \frac{2i}{7d(e\sec(c+dx))^{5/2}\sqrt{a+ia\tan(c+dx)}} + \frac{6\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\sec(c+dx))^{5/2}}\,dx}{7a}$$

$$= \frac{2i}{7d(e\sec(c+dx))^{5/2}\sqrt{a+ia\tan(c+dx)}} - \frac{12i\sqrt{a+ia\tan(c+d}}{35ad(e\sec(c+dx))^{5}}$$

$$= \frac{2i}{7d(e\sec(c+dx))^{5/2}\sqrt{a+ia\tan(c+dx)}} + \frac{16}{35de^2\sqrt{e\sec(c+dx)}}$$

$$= \frac{2i}{7d(e\sec(c+dx))^{5/2}\sqrt{a+ia\tan(c+dx)}} + \frac{16}{35de^2\sqrt{e\sec(c+dx)}}$$

Mathematica [A] time = 0.38, size = 79, normalized size = 0.48

$$-\frac{i(\cos(2(c+dx)) + 35i\tan(c+dx) + 3i\sin(3(c+dx))\sec(c+dx) + 17)}{35de^2\sqrt{a+ia\tan(c+dx)}\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Sec[c + d*x])^(5/2)*Sqrt[a + I*a*Tan[c + d*x]]),x]
```

```
[Out] ((-1/35*I)*(17 + Cos[2*(c + d*x)] + (3*I)*Sec[c + d*x]*Sin[3*(c + d*x)] + (
35*I)*Tan[c + d*x]))/(d*e^2*Sqrt[e*Sec[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]
)
```

fricas [A] time = 0.57, size = 100, normalized size = 0.61

$$\frac{\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(-7i\,e^{(8i\,dx+8i\,c)} - 112i\,e^{(6i\,dx+6i\,c)} - 70i\,e^{(4i\,dx+4i\,c)} + 40i\,e^{(2i\,dx+2i\,c)} + 5i\right)e^{\left(-\frac{7}{2}i\,dx-\frac{7}{2}i\,c\right)}}{140\,ade^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fri
cas")
```

```
[Out] 1/140*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(
-7*I*e^(8*I*d*x + 8*I*c) - 112*I*e^(6*I*d*x + 6*I*c) - 70*I*e^(4*I*d*x + 4*
I*c) + 40*I*e^(2*I*d*x + 2*I*c) + 5*I)*e^(-7/2*I*d*x - 7/2*I*c)/(a*d*e^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\sec(dx+c))^{\frac{5}{2}}\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="gia
c")
```

```
[Out] integrate(1/((e*sec(d*x + c))^(5/2)*sqrt(I*a*tan(d*x + c) + a)), x)
```

maple [A] time = 1.19, size = 115, normalized size = 0.70

$$\frac{2\left(\cos^3(dx+c)\right)\left(\frac{e}{\cos(dx+c)}\right)^{\frac{5}{2}}\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(5i\left(\cos^4(dx+c)\right)+5\left(\cos^3(dx+c)\right)\sin(dx+c)+2i\left(\text{co}\right.\right.}{35d\,e^5a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 2/35/d*cos(d*x+c)^3*(e/cos(d*x+c))^(5/2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d
*x+c))^(1/2)*(5*I*cos(d*x+c)^4+5*cos(d*x+c)^3*sin(d*x+c)+2*I*cos(d*x+c)^2+8
*cos(d*x+c)*sin(d*x+c)-16*I)/e^5/a
```

maxima [A] time = 1.03, size = 178, normalized size = 1.08

$$\frac{5i\cos\left(\frac{7}{2}dx+\frac{7}{2}c\right)-7i\cos\left(\frac{5}{7}\arctan\left(\sin\left(\frac{7}{2}dx+\frac{7}{2}c\right),\cos\left(\frac{7}{2}dx+\frac{7}{2}c\right)\right)\right)+35i\cos\left(\frac{3}{7}\arctan\left(\sin\left(\frac{7}{2}dx+\frac{7}{2}c\right)\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="max
ima")
```

```
[Out] 1/140*(5*I*cos(7/2*d*x + 7/2*c) - 7*I*cos(5/7*arctan2(sin(7/2*d*x + 7/2*c),
 cos(7/2*d*x + 7/2*c))) + 35*I*cos(3/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/
2*d*x + 7/2*c))) - 105*I*cos(1/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x
+ 7/2*c))) + 5*sin(7/2*d*x + 7/2*c) + 7*sin(5/7*arctan2(sin(7/2*d*x + 7/2*c
), cos(7/2*d*x + 7/2*c))) + 35*sin(3/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/
2*d*x + 7/2*c))) + 105*sin(1/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x +
7/2*c))))/(sqrt(a)*d*e^(5/2))
```

mupad [B] time = 4.21, size = 101, normalized size = 0.61

$$-\frac{\sqrt{\frac{e}{\cos(c+d\,x)}}\,\left(-\sin\left(c+d\,x\right)-\frac{3\,\sin(3\,c+3\,d\,x)}{35}+\frac{\cos(c+d\,x)\,1{}\mathrm{i}}{2}+\frac{\cos(3\,c+3\,d\,x)\,1{}\mathrm{i}}{70}\right)}{d\,e^3\,\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1{}\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e/cos(c + d*x))^(5/2)*(a + a*tan(c + d*x)*1i)^(1/2)),x)
```

```
[Out] -((e/cos(c + d*x))^(1/2)*((cos(c + d*x)*1i)/2 - sin(c + d*x) + (cos(3*c + 3
*d*x)*1i)/70 - (3*sin(3*c + 3*d*x))/35))/(d*e^3*((a*(cos(2*c + 2*d*x) + sin
(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(e\sec\left(c+dx\right)\right)^{\frac{5}{2}}\sqrt{ia\left(\tan\left(c+dx\right)-i\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))**(5/2)/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(1/((e*sec(c + d*x))**(5/2)*sqrt(I*a*(tan(c + d*x) - I))), x)
```

3.422 $\int \frac{1}{(e\sec(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=206

$$\frac{256i\sqrt{e\sec(c+dx)}}{315de^4\sqrt{a+ia\tan(c+dx)}}-\frac{128i\sqrt{a+ia\tan(c+dx)}}{315ade^2(e\sec(c+dx))^{3/2}}+\frac{32i}{105de^2\sqrt{a+ia\tan(c+dx)}\,(e\sec(c+dx))^{3/2}}-\frac{16i\sqrt{a+}}{63ad(e}$$

```
[Out] 2/9*I/d/(e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^(1/2)+32/105*I/d/e^2/(e*sec
(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2)+256/315*I*(e*sec(d*x+c))^(1/2)/d/e^
4/(a+I*a*tan(d*x+c))^(1/2)-16/63*I*(a+I*a*tan(d*x+c))^(1/2)/a/d/(e*sec(d*x+
c))^(7/2)-128/315*I*(a+I*a*tan(d*x+c))^(1/2)/a/d/e^2/(e*sec(d*x+c))^(3/2)
```

Rubi [A] time = 0.39, antiderivative size = 206, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {3502, 3497, 3488}

$$\frac{256i\sqrt{e\sec(c+dx)}}{315de^4\sqrt{a+ia\tan(c+dx)}}-\frac{128i\sqrt{a+ia\tan(c+dx)}}{315ade^2(e\sec(c+dx))^{3/2}}+\frac{32i}{105de^2\sqrt{a+ia\tan(c+dx)}\,(e\sec(c+dx))^{3/2}}-\frac{16i\sqrt{a+}}{63ad(e}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Sec[c + d*x])^(7/2)*Sqrt[a + I*a*Tan[c + d*x]]),x]
```

```
[Out] ((2*I)/9)/(d*(e*Sec[c + d*x])^(7/2)*Sqrt[a + I*a*Tan[c + d*x]]) + ((32*I)/1
05)/(d*e^2*(e*Sec[c + d*x])^(3/2)*Sqrt[a + I*a*Tan[c + d*x]]) + (((256*I)/3
15)*Sqrt[e*Sec[c + d*x]])/(d*e^4*Sqrt[a + I*a*Tan[c + d*x]]) - (((16*I)/63)
*Sqrt[a + I*a*Tan[c + d*x]])/(a*d*(e*Sec[c + d*x])^(7/2)) - (((128*I)/315)*
Sqrt[a + I*a*Tan[c + d*x]])/(a*d*e^2*(e*Sec[c + d*x])^(3/2))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{1}{(e\sec(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}}\,dx = \frac{2i}{9d(e\sec(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}} + \frac{8\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\sec(c+dx))^{7/2}}\,dx}{9a}$$

$$= \frac{2i}{9d(e\sec(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}} - \frac{16i\sqrt{a+ia\tan(c+dx)}}{63ad(e\sec(c+dx))^{7/2}}$$

$$= \frac{2i}{9d(e\sec(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}} + \frac{32i}{105de^2(e\sec(c+dx))^{3/2}}$$

$$= \frac{2i}{9d(e\sec(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}} + \frac{32i}{105de^2(e\sec(c+dx))^{3/2}}$$

$$= \frac{2i}{9d(e\sec(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}} + \frac{32i}{105de^2(e\sec(c+dx))^{3/2}}$$

Mathematica [A] time = 0.43, size = 87, normalized size = 0.42

$$\frac{\sqrt{e\sec(c+dx)}\,(336\sin(2(c+dx))+40\sin(4(c+dx))-84i\cos(2(c+dx))-5i\cos(4(c+dx))+945i)}{1260de^4\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Sec[c + d*x])^(7/2)*Sqrt[a + I*a*Tan[c + d*x]]),x]
```

```
[Out] (Sqrt[e*Sec[c + d*x]]*(945*I - (84*I)*Cos[2*(c + d*x)] - (5*I)*Cos[4*(c + d
*x)] + 336*Sin[2*(c + d*x)] + 40*Sin[4*(c + d*x)]))/(1260*d*e^4*Sqrt[a + I*
a*Tan[c + d*x]])
```

fricas [A] time = 0.68, size = 111, normalized size = 0.54

$$\frac{\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(-45i\,e^{(10i\,dx+10i\,c)}-465i\,e^{(8i\,dx+8i\,c)}+1470i\,e^{(6i\,dx+6i\,c)}+2142i\,e^{(4i\,dx+4i\,c)}+287i\,e^{(2i\,dx+2i\,c)}\right.}{2520\,ade^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fri
cas")
```

```
[Out] 1/2520*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*
(-45*I*e^(10*I*d*x + 10*I*c) - 465*I*e^(8*I*d*x + 8*I*c) + 1470*I*e^(6*I*d*
x + 6*I*c) + 2142*I*e^(4*I*d*x + 4*I*c) + 287*I*e^(2*I*d*x + 2*I*c) + 35*I)
*e^(-9/2*I*d*x - 9/2*I*c)/(a*d*e^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\sec(dx+c))^{\frac{7}{2}}\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="gia
c")
```

```
[Out] integrate(1/((e*sec(d*x + c))^(7/2)*sqrt(I*a*tan(d*x + c) + a)), x)
```

maple [A] time = 1.25, size = 132, normalized size = 0.64

$$\frac{2\left(\frac{e}{\cos(dx+c)}\right)^{\frac{7}{2}}\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(\cos^{4}(dx+c)\right)\left(35i\left(\cos^{5}(dx+c)\right)+35\sin(dx+c)\left(\cos^{4}(dx+c)\right)+8i\right.}{315d\,e^{7}a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 2/315/d*(e/cos(d*x+c))^(7/2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)
*cos(d*x+c)^4*(35*I*cos(d*x+c)^5+35*sin(d*x+c)*cos(d*x+c)^4+8*I*cos(d*x+c)^
3+48*cos(d*x+c)^2*sin(d*x+c)+64*I*cos(d*x+c)+128*sin(d*x+c))/e^7/a
```

maxima [A] time = 1.14, size = 226, normalized size = 1.10

$$35i\cos\left(\frac{9}{2}dx+\frac{9}{2}c\right)-45i\cos\left(\frac{7}{9}\arctan\left(\sin\left(\frac{9}{2}dx+\frac{9}{2}c\right),\cos\left(\frac{9}{2}dx+\frac{9}{2}c\right)\right)\right)+252i\cos\left(\frac{5}{9}\arctan\left(\sin\left(\frac{9}{2}dx\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="max
ima")
```

```
[Out] 1/2520*(35*I*cos(9/2*d*x + 9/2*c) - 45*I*cos(7/9*arctan2(sin(9/2*d*x + 9/2*
c), cos(9/2*d*x + 9/2*c))) + 252*I*cos(5/9*arctan2(sin(9/2*d*x + 9/2*c), co
s(9/2*d*x + 9/2*c))) - 420*I*cos(1/3*arctan2(sin(9/2*d*x + 9/2*c), cos(9/2*
d*x + 9/2*c))) + 1890*I*cos(1/9*arctan2(sin(9/2*d*x + 9/2*c), cos(9/2*d*x +
 9/2*c))) + 35*sin(9/2*d*x + 9/2*c) + 45*sin(7/9*arctan2(sin(9/2*d*x + 9/2*
c), cos(9/2*d*x + 9/2*c))) + 252*sin(5/9*arctan2(sin(9/2*d*x + 9/2*c), cos(
9/2*d*x + 9/2*c))) + 420*sin(1/3*arctan2(sin(9/2*d*x + 9/2*c), cos(9/2*d*x
+ 9/2*c))) + 1890*sin(1/9*arctan2(sin(9/2*d*x + 9/2*c), cos(9/2*d*x + 9/2*c
))))/(sqrt(a)*d*e^(7/2))
```

mupad [B] time = 4.31, size = 109, normalized size = 0.53

$$\frac{\sqrt{\frac{e}{\cos(c+d\,x)}}\,\left(336\,\sin(2\,c+2\,d\,x)-\cos(4\,c+4\,d\,x)\,5\mathrm{i}-\cos(2\,c+2\,d\,x)\,84\mathrm{i}+40\,\sin(4\,c+4\,d\,x)+945\mathrm{i}\right)}{1260\,d\,e^4\,\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e/cos(c + d*x))^(7/2)*(a + a*tan(c + d*x)*1i)^(1/2)),x)
```

```
[Out] ((e/cos(c + d*x))^(1/2)*(336*sin(2*c + 2*d*x) - cos(4*c + 4*d*x)*5i - cos(2
*c + 2*d*x)*84i + 40*sin(4*c + 4*d*x) + 945i))/(1260*d*e^4*((a*(cos(2*c + 2
*d*x) + sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1))^(1/2))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))**(7/2)/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

3.423 $\int \frac{(e\sec(c+dx))^{7/2}}{(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=529

$$-\frac{3ie^{7/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\sqrt{a}d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}+\frac{3ie^{7/2}\sec(c+dx)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\sqrt{a}d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}+\frac{3ie^{7/2}\sec(\ldots}{\ldots}$$

```
[Out] -I*e^2*(e*sec(d*x+c))^(3/2)/a/d/(a+I*a*tan(d*x+c))^(1/2)-3/2*I*e^(7/2)*arct
an(1-2^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*sec(d*x+c))^(1/2))
*sec(d*x+c)/d*2^(1/2)/a^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(
1/2)+3/2*I*e^(7/2)*arctan(1+2^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/a^(1/2
)/(e*sec(d*x+c))^(1/2))*sec(d*x+c)/d*2^(1/2)/a^(1/2)/(a-I*a*tan(d*x+c))^(1/
2)/(a+I*a*tan(d*x+c))^(1/2)+3/4*I*e^(7/2)*ln(a-2^(1/2)*a^(1/2)*e^(1/2)*(a-I
*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2)+cos(d*x+c)*(a-I*a*tan(d*x+c)))*se
c(d*x+c)/d*2^(1/2)/a^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2
)-3/4*I*e^(7/2)*ln(a+2^(1/2)*a^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/(e*se
c(d*x+c))^(1/2)+cos(d*x+c)*(a-I*a*tan(d*x+c)))*sec(d*x+c)/d*2^(1/2)/a^(1/2)
/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)
```

Rubi [A] time = 0.57, antiderivative size = 529, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {3500, 3498, 3499, 3495, 297, 1162, 617, 204, 1165, 628}

$$-\frac{3ie^{7/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\sqrt{a}d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}+\frac{3ie^{7/2}\sec(c+dx)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\sqrt{a}d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}-\frac{ie^2(e\sec(\ldots}{ad\sqrt{a+ia\ldots}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(7/2)/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] ((-I)*e^2*(e*Sec[c + d*x])^(3/2))/(a*d*Sqrt[a + I*a*Tan[c + d*x]]) - ((3*I)
*e^(7/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])/(Sqrt[a]*S
qrt[e*Sec[c + d*x]])]*Sec[c + d*x])/(Sqrt[2]*Sqrt[a]*d*Sqrt[a - I*a*Tan[c +
 d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) + ((3*I)*e^(7/2)*ArcTan[1 + (Sqrt[2]*Sqr
t[e]*Sqrt[a - I*a*Tan[c + d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])]*Sec[c + d*
x])/(Sqrt[2]*Sqrt[a]*d*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]
]) + (((3*I)/2)*e^(7/2)*Log[a - (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a - I*a*Tan[c
 + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a - I*a*Tan[c + d*x])]*Sec[c
 + d*x])/(Sqrt[2]*Sqrt[a]*d*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c +
 d*x]]) - (((3*I)/2)*e^(7/2)*Log[a + (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a - I*a*
Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a - I*a*Tan[c + d*x])]*
Sec[c + d*x])/(Sqrt[2]*Sqrt[a]*d*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Ta
n[c + d*x]])
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3495

```
Int[Sqrt[(d_.)*sec[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[(-4*b*d^2)/f, Subst[Int[x^2/(a^2 + d^2*x^4), x],
 x, Sqrt[a + b*Tan[e + f*x]]/Sqrt[d*Sec[e + f*x]]], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3498

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m}, x] && EqQ[a^2 + b^2, 0] && GtQ[n, 0] && NeQ[m + n - 1, 0] && IntegersQ[
2*m, 2*n]
```

Rule 3499

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(3/2)/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_
.)*(x_)]], x_Symbol] :> Dist[(d*Sec[e + f*x])/(Sqrt[a - b*Tan[e + f*x]]*Sqr
t[a + b*Tan[e + f*x]]), Int[Sqrt[d*Sec[e + f*x]]*Sqrt[a - b*Tan[e + f*x]],
x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{7/2}}{(a+ia\tan(c+dx))^{3/2}}\,dx = -\frac{4ie^2(e\sec(c+dx))^{3/2}}{ad\sqrt{a+ia\tan(c+dx)}} + \frac{\left(3e^2\right)\int (e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}\,dx}{a^2}$$

$$= -\frac{ie^2(e\sec(c+dx))^{3/2}}{ad\sqrt{a+ia\tan(c+dx)}} + \frac{\left(3e^2\right)\int \frac{(e\sec(c+dx))^{3/2}}{\sqrt{a+ia\tan(c+dx)}}\,dx}{2a}$$

$$= -\frac{ie^2(e\sec(c+dx))^{3/2}}{ad\sqrt{a+ia\tan(c+dx)}} + \frac{\left(3e^3\sec(c+dx)\right)\int \sqrt{e\sec(c+dx)}\,\sqrt{a-ia\tan(c+dx)}}{2a\sqrt{a-ia\tan(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}$$

$$= -\frac{ie^2(e\sec(c+dx))^{3/2}}{ad\sqrt{a+ia\tan(c+dx)}} + \frac{\left(6ie^5\sec(c+dx)\right)\text{Subst}\left(\int \frac{x^2}{a^2+e^2x^4}\,dx, x, \frac{\sqrt{a-ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\right.}{d\sqrt{a-ia\tan(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}$$

$$= -\frac{ie^2(e\sec(c+dx))^{3/2}}{ad\sqrt{a+ia\tan(c+dx)}} - \frac{\left(3ie^4\sec(c+dx)\right)\text{Subst}\left(\int \frac{a-ex^2}{a^2+e^2x^4}\,dx, x, \frac{\sqrt{a-ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\right.}{d\sqrt{a-ia\tan(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}$$

$$= -\frac{ie^2(e\sec(c+dx))^{3/2}}{ad\sqrt{a+ia\tan(c+dx)}} + \frac{\left(3ie^3\sec(c+dx)\right)\text{Subst}\left(\int \frac{1}{\frac{a}{e}-\frac{\sqrt{2}\sqrt{a}x}{\sqrt{e}}+x^2}\,dx, x, \frac{\sqrt{a-ia\tan(}{\sqrt{e\sec(c-}}\right.}{2d\sqrt{a-ia\tan(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}$$

$$= -\frac{ie^2(e\sec(c+dx))^{3/2}}{ad\sqrt{a+ia\tan(c+dx)}} + \frac{3ie^{7/2}\log\left(a-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}+\cos(c+dx)(a-\right.}{2\sqrt{2}\sqrt{a}\,d\sqrt{a-ia\tan(c+dx)}\,\sqrt{a+ia}}$$

$$= -\frac{ie^2(e\sec(c+dx))^{3/2}}{ad\sqrt{a+ia\tan(c+dx)}} - \frac{3ie^{7/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)\sec(c+dx)}{\sqrt{2}\sqrt{a}\,d\sqrt{a-ia\tan(c+dx)}\,\sqrt{a+ia\tan(c+dx)}} + \frac{3ie}{\sqrt{2}}$$

Mathematica [B] time = 52.09, size = 11282, normalized size = 21.33

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Sec[c + d*x])^(7/2)/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] Result too large to show
```

fricas [A] time = 0.70, size = 483, normalized size = 0.91

$$\frac{-4ie^3\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}e^{\left(\frac{1}{2}idx+\frac{1}{2}ic\right)}-\sqrt{\frac{9ie^7}{a^3d^2}}a^2d\log\left(-\frac{2\left(i\sqrt{\frac{9ie^7}{a^3d^2}}a^2d-3\left(e^3e^{(2idx+2ic)}+e^3\right)\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}\right.}{3e^3}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="frica
s")
```

```
[Out] 1/2*(-4*I*e^3*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c)
 + 1))*e^(1/2*I*d*x + 1/2*I*c) - sqrt(9*I*e^7/(a^3*d^2))*a^2*d*log(-2/3*(I*
sqrt(9*I*e^7/(a^3*d^2))*a^2*d - 3*(e^3*e^(2*I*d*x + 2*I*c) + e^3)*sqrt(a/(e
^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1
/2*I*c))/e^3) + sqrt(9*I*e^7/(a^3*d^2))*a^2*d*log(-2/3*(-I*sqrt(9*I*e^7/(a^
3*d^2))*a^2*d - 3*(e^3*e^(2*I*d*x + 2*I*c) + e^3)*sqrt(a/(e^(2*I*d*x + 2*I*
```

```
c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))/e^3) +
sqrt(-9*I*e^7/(a^3*d^2))*a^2*d*log(1/3*(2*I*sqrt(-9*I*e^7/(a^3*d^2))*a^2*d
+ 6*(e^3*e^(2*I*d*x + 2*I*c) + e^3)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(
e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))/e^3) - sqrt(-9*I*e^7/
(a^3*d^2))*a^2*d*log(1/3*(-2*I*sqrt(-9*I*e^7/(a^3*d^2))*a^2*d + 6*(e^3*e^(2
*I*d*x + 2*I*c) + e^3)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x
 + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))/e^3))/(a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{7}{2}}}{(i\,a\tan(dx+c)+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac"
)
```

```
[Out] integrate((e*sec(d*x + c))^(7/2)/(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [B] time = 1.16, size = 1022, normalized size = 1.93

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] -1/4/d*(-1+cos(d*x+c))^3*(6*I*cos(d*x+c)^3*arctanh(1/2*(1/(1+cos(d*x+c)))^(
1/2)*(cos(d*x+c)+1-sin(d*x+c)))+3*I*cos(d*x+c)*sin(d*x+c)*arctanh(1/2*(1/(1
+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+3*I*cos(d*x+c)*sin(d*x+c)*ar
ctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))-6*I*cos(d*x+c
)^2*sin(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c
)))+3*I*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin
(d*x+c)))-6*I*cos(d*x+c)^3*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)
+1+sin(d*x+c)))-3*I*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(
d*x+c)+1-sin(d*x+c)))+3*I*cos(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(
cos(d*x+c)+1+sin(d*x+c)))-3*I*cos(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/
2)*(cos(d*x+c)+1-sin(d*x+c)))-6*cos(d*x+c)^3*arctanh(1/2*(1/(1+cos(d*x+c)))
^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))-6*cos(d*x+c)^3*arctanh(1/2*(1/(1+cos(d*x+
c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))-6*cos(d*x+c)^2*sin(d*x+c)*arctanh(1/2
*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))+6*cos(d*x+c)^2*sin(d*x
+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))-4*I*cos
(d*x+c)*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)-6*I*cos(d*x+c)^2*sin(d*x+c)*arc
tanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))-4*cos(d*x+c)^2
*(1/(1+cos(d*x+c)))^(1/2)+3*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/
2)*(cos(d*x+c)+1-sin(d*x+c)))+3*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos(d*x+c)))
^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+3*cos(d*x+c)*sin(d*x+c)*arctanh(1/2*(1/(1
+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))-3*cos(d*x+c)*sin(d*x+c)*arct
anh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+3*cos(d*x+c)*ar
ctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))+3*cos(d*x+c)*
arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+4*(1/(1+cos
(d*x+c)))^(1/2))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*cos(d*x+c)^
3*(e/cos(d*x+c))^(7/2)/(2*I*cos(d*x+c)*sin(d*x+c)+2*cos(d*x+c)^2-1)/sin(d*x
+c)^7/(1/(1+cos(d*x+c)))^(7/2)/a^2
```

maxima [B] time = 1.25, size = 1819, normalized size = 3.44

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxim
a")

[Out] -(48*sqrt(2)*e^3*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c) + 1, sqrt(2)*sin(1/2*
d*x + 1/2*c) + 1) + 48*sqrt(2)*e^3*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c) + 1
, -sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) + 48*sqrt(2)*e^3*arctan2(sqrt(2)*cos(1
/2*d*x + 1/2*c) - 1, sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) + 48*sqrt(2)*e^3*arc
tan2(sqrt(2)*cos(1/2*d*x + 1/2*c) - 1, -sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) +
 24*I*sqrt(2)*e^3*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 24*
I*sqrt(2)*e^3*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 24*I*sq
rt(2)*e^3*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(
2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 24*I*sqrt(2
)*e^3*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*c
os(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 128*e^3*cos(1/2
*d*x + 1/2*c) + 128*I*e^3*sin(1/2*d*x + 1/2*c) + (48*I*sqrt(2)*e^3*cos(2*d*
x + 2*c) - 48*sqrt(2)*e^3*sin(2*d*x + 2*c) + 48*I*sqrt(2)*e^3)*arctan2(sqrt
(2)*sin(1/2*d*x + 1/2*c) + sin(d*x + c), sqrt(2)*cos(1/2*d*x + 1/2*c) + cos
(d*x + c) + 1) + (-48*I*sqrt(2)*e^3*cos(2*d*x + 2*c) + 48*sqrt(2)*e^3*sin(2
*d*x + 2*c) - 48*I*sqrt(2)*e^3)*arctan2(-sqrt(2)*sin(1/2*d*x + 1/2*c) + sin
(d*x + c), -sqrt(2)*cos(1/2*d*x + 1/2*c) + cos(d*x + c) + 1) + (48*sqrt(2)*
e^3*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c) + 1, sqrt(2)*sin(1/2*d*x + 1/2*c)
+ 1) + 48*sqrt(2)*e^3*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c) + 1, -sqrt(2)*si
n(1/2*d*x + 1/2*c) + 1) + 48*sqrt(2)*e^3*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*
c) - 1, sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) + 48*sqrt(2)*e^3*arctan2(sqrt(2)*
cos(1/2*d*x + 1/2*c) - 1, -sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) + 24*I*sqrt(2)
*e^3*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 24*I*sqrt(2)*e^3
*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 24*I*sqrt(2)*e^3*log
(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*
x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 24*I*sqrt(2)*e^3*log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(2*d*x + 2*c) + (24*sqrt(2
)*e^3*cos(2*d*x + 2*c) + 24*I*sqrt(2)*e^3*sin(2*d*x + 2*c) + 24*sqrt(2)*e^3
)*log(2*sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + 2*(sqrt(2)*cos(1/2*d*x
+ 1/2*c) + 1)*cos(d*x + c) + cos(d*x + c)^2 + 2*cos(1/2*d*x + 1/2*c)^2 + si
n(d*x + c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) +
1) - (24*sqrt(2)*e^3*cos(2*d*x + 2*c) + 24*I*sqrt(2)*e^3*sin(2*d*x + 2*c) +
 24*sqrt(2)*e^3)*log(-2*sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) - 2*(sqrt
(2)*cos(1/2*d*x + 1/2*c) - 1)*cos(d*x + c) + cos(d*x + c)^2 + 2*cos(1/2*d*x
 + 1/2*c)^2 + sin(d*x + c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2
*d*x + 1/2*c) + 1) + (48*I*sqrt(2)*e^3*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c)
 + 1, sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) + 48*I*sqrt(2)*e^3*arctan2(sqrt(2)*
cos(1/2*d*x + 1/2*c) + 1, -sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) + 48*I*sqrt(2)
*e^3*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c) - 1, sqrt(2)*sin(1/2*d*x + 1/2*c)
 + 1) + 48*I*sqrt(2)*e^3*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c) - 1, -sqrt(2)
*sin(1/2*d*x + 1/2*c) + 1) - 24*sqrt(2)*e^3*log(2*cos(1/2*d*x + 1/2*c)^2 +
2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1
/2*d*x + 1/2*c) + 2) + 24*sqrt(2)*e^3*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(
1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x
 + 1/2*c) + 2) - 24*sqrt(2)*e^3*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*
x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2
*c) + 2) + 24*sqrt(2)*e^3*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/
2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) +
2))*sin(2*d*x + 2*c))*sqrt(a)*sqrt(e)/((-64*I*a^2*cos(2*d*x + 2*c) + 64*a^2
*sin(2*d*x + 2*c) - 64*I*a^2)*d)

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{7/2}}{(a+a\tan\left(c+d\,x\right)\,1\mathrm{i})^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(7/2)/(a + a*tan(c + d*x)*1i)^(3/2),x)
[Out] int((e/cos(c + d*x))^(7/2)/(a + a*tan(c + d*x)*1i)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(7/2)/(a+I*a*tan(d*x+c))**(3/2),x)
[Out] Timed out
```

3.424 $\int \frac{(e\sec(c+dx))^{5/2}}{(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=365

$$-\frac{i\sqrt{2}\,e^{5/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{a^{3/2}d}+\frac{i\sqrt{2}\,e^{5/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{a^{3/2}d}+\frac{ie^{5/2}\log\left(-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a+ia\tan(c-}{\sqrt{e\sec(c+dx)}}\right.}{}$$

```
[Out] 1/2*I*e^(5/2)*ln(a-2^(1/2)*a^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/(e*sec(
d*x+c))^(1/2)+cos(d*x+c)*(a+I*a*tan(d*x+c)))/a^(3/2)/d*2^(1/2)-1/2*I*e^(5/2
)*ln(a+2^(1/2)*a^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2
)+cos(d*x+c)*(a+I*a*tan(d*x+c)))/a^(3/2)/d*2^(1/2)-I*e^(5/2)*arctan(1-2^(1/
2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*sec(d*x+c))^(1/2))*2^(1/2)/a
^(3/2)/d+I*e^(5/2)*arctan(1+2^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/a^(1/2
)/(e*sec(d*x+c))^(1/2))*2^(1/2)/a^(3/2)/d+4*I*e^2*(e*sec(d*x+c))^(1/2)/a/d/
(a+I*a*tan(d*x+c))^(1/2)
```

Rubi [A] time = 0.32, antiderivative size = 365, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {3500, 3495, 297, 1162, 617, 204, 1165, 628}

$$-\frac{i\sqrt{2}\,e^{5/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{a^{3/2}d}+\frac{i\sqrt{2}\,e^{5/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{a^{3/2}d}+\frac{ie^{5/2}\log\left(-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a+ia\tan(c-}{\sqrt{e\sec(c+dx)}}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(5/2)/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] ((-I)*Sqrt[2]*e^(5/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]
])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])])/(a^(3/2)*d) + (I*Sqrt[2]*e^(5/2)*ArcTan
[1 + (Sqrt[2]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d
*x]])])/(a^(3/2)*d) + (I*e^(5/2)*Log[a - (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a +
I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a + I*a*Tan[c + d*x
])])/(Sqrt[2]*a^(3/2)*d) - (I*e^(5/2)*Log[a + (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt
[a + I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a + I*a*Tan[c
+ d*x])])/(Sqrt[2]*a^(3/2)*d) + ((4*I)*e^2*Sqrt[e*Sec[c + d*x]])/(a*d*Sqrt[
a + I*a*Tan[c + d*x]])
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3495

```
Int[Sqrt[(d_.)*sec[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[(-4*b*d^2)/f, Subst[Int[x^2/(a^2 + d^2*x^4), x],
 x, Sqrt[a + b*Tan[e + f*x]]/Sqrt[d*Sec[e + f*x]]], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{5/2}}{(a+ia\tan(c+dx))^{3/2}}\,dx = \frac{4ie^2\sqrt{e\sec(c+dx)}}{ad\sqrt{a+ia\tan(c+dx)}} - \frac{e^2\int \sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}\,dx}{a^2}$$

$$= \frac{4ie^2\sqrt{e\sec(c+dx)}}{ad\sqrt{a+ia\tan(c+dx)}} + \frac{(4ie^4)\,\text{Subst}\left(\int \frac{x^2}{a^2+e^2x^4}\,dx, x, \frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\right)}{ad}$$

$$= \frac{4ie^2\sqrt{e\sec(c+dx)}}{ad\sqrt{a+ia\tan(c+dx)}} - \frac{(2ie^3)\,\text{Subst}\left(\int \frac{a-ex^2}{a^2+e^2x^4}\,dx, x, \frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\right)}{ad} + \frac{(2ie^3)\,\text{Su}}{}$$

$$= \frac{4ie^2\sqrt{e\sec(c+dx)}}{ad\sqrt{a+ia\tan(c+dx)}} + \frac{(ie^2)\,\text{Subst}\left(\int \frac{1}{\frac{a}{e}-\frac{\sqrt{2}\sqrt{a}x}{\sqrt{e}}+x^2}\,dx, x, \frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\right)}{ad} + \frac{(ie^2)}{}$$

$$= \frac{ie^{5/2}\log\left(a - \frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}} + \cos(c+dx)(a+ia\tan(c+dx))\right)}{\sqrt{2}\,a^{3/2}d} - \frac{ie^{5/2}\log(}{}$$

$$= -\frac{i\sqrt{2}\,e^{5/2}\tan^{-1}\left(1 - \frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{a^{3/2}d} + \frac{i\sqrt{2}\,e^{5/2}\tan^{-1}\left(1 + \frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{a^{3/2}d}$$

Mathematica [A] time = 4.03, size = 338, normalized size = 0.93

$$\frac{e(\cos(dx)+i\sin(dx))^2(e\sec(c+dx))^{3/2}\left((-4\sin(c)+4i\cos(c))\cos(dx)+4(\cos(c)+i\sin(c))\sin(dx)+\frac{2(\cos(2c)+i}{}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(5/2)/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (e*(e*Sec[c + d*x])^(3/2)*(Cos[d*x] + I*Sin[d*x])^2*(Cos[d*x]*((4*I)*Cos[c]
 - 4*Sin[c]) + 4*(Cos[c] + I*Sin[c])*Sin[d*x] + (2*(ArcTanh[(Sqrt[1 - I*Cos
[c] + Sin[c]]*Sqrt[I - Tan[(d*x)/2]])/(Sqrt[-1 - I*Cos[c] - Sin[c]]*Sqrt[I
+ Tan[(d*x)/2]])]*Sqrt[-1 - I*Cos[c] - Sin[c]]*Sqrt[1 + I*Cos[c] - Sin[c]]
- ArcTanh[(Sqrt[1 + I*Cos[c] - Sin[c]]*Sqrt[I - Tan[(d*x)/2]])/(Sqrt[-1 + I
*Cos[c] + Sin[c]]*Sqrt[I + Tan[(d*x)/2]])]*Sqrt[1 - I*Cos[c] + Sin[c]]*Sqrt
[-1 + I*Cos[c] + Sin[c]])*(Cos[2*c] + I*Sin[2*c])*Sqrt[I + Tan[(d*x)/2]])/(
Sqrt[1 + Cos[2*c] + I*Sin[2*c]]*Sqrt[I - Tan[(d*x)/2]])))/(d*(a + I*a*Tan[c
 + d*x])^(3/2))
```

fricas [A] time = 0.66, size = 539, normalized size = 1.48

$$-\frac{\left(a^2d\sqrt{\frac{4ie^5}{a^3d^2}}\,e^{(idx+ic)}\log\left(\frac{a^2d\sqrt{\frac{4ie^5}{a^3d^2}}+2\left(e^2e^{(2idx+2ic)}+e^2\right)\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}\,e^{\left(\frac{1}{2}idx+\frac{1}{2}ic\right)}}{e^2}\right)-a^2d\sqrt{\frac{4ie^5}{a^3d^2}}\,e^{(idx+ic)}\log\left(-\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="frica
s")
```

```
[Out] -1/2*(a^2*d*sqrt(4*I*e^5/(a^3*d^2))*e^(I*d*x + I*c)*log((a^2*d*sqrt(4*I*e^5
/(a^3*d^2)) + 2*(e^2*e^(2*I*d*x + 2*I*c) + e^2)*sqrt(a/(e^(2*I*d*x + 2*I*c)
```

```
 + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))/e^2) - a^
2*d*sqrt(4*I*e^5/(a^3*d^2))*e^(I*d*x + I*c)*log(-(a^2*d*sqrt(4*I*e^5/(a^3*d
^2)) - 2*(e^2*e^(2*I*d*x + 2*I*c) + e^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*
sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))/e^2) - a^2*d*sqr
t(-4*I*e^5/(a^3*d^2))*e^(I*d*x + I*c)*log((a^2*d*sqrt(-4*I*e^5/(a^3*d^2)) +
 2*(e^2*e^(2*I*d*x + 2*I*c) + e^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e
/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))/e^2) + a^2*d*sqrt(-4*I
*e^5/(a^3*d^2))*e^(I*d*x + I*c)*log(-(a^2*d*sqrt(-4*I*e^5/(a^3*d^2)) - 2*(e
^2*e^(2*I*d*x + 2*I*c) + e^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(
2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))/e^2) - 2*(4*I*e^2*e^(2*I*d*
x + 2*I*c) + 4*I*e^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x
+ 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))*e^(-I*d*x - I*c)/(a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e \sec(dx+c))^{\frac{5}{2}}}{(i a \tan(dx+c)+a)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac"
)
```

```
[Out] integrate((e*sec(d*x + c))^(5/2)/(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [B] time = 1.32, size = 957, normalized size = 2.62

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] -1/2/d*(-1+cos(d*x+c))^2*(-I*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+
c)+1-sin(d*x+c)))*sin(d*x+c)-8*I*(1/(1+cos(d*x+c)))^(1/2)*cos(d*x+c)*sin(d*
x+c)+2*I*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))*co
s(d*x+c)*sin(d*x+c)+2*I*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-
sin(d*x+c)))*cos(d*x+c)*sin(d*x+c)-2*I*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)
*(cos(d*x+c)+1+sin(d*x+c)))*cos(d*x+c)^2+2*cos(d*x+c)^2*arctanh(1/2*(1/(1+c
os(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))-2*cos(d*x+c)*sin(d*x+c)*arctan
h(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))+2*I*arctanh(1/2*(
1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))*cos(d*x+c)^2-I*arctanh(1
/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))+2*cos(d*x+c)^2*arcta
nh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+2*cos(d*x+c)*sin
(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+I*c
os(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))-I
*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))*sin(d*x+c)
-8*cos(d*x+c)^2*(1/(1+cos(d*x+c)))^(1/2)-cos(d*x+c)*arctanh(1/2*(1/(1+cos(d
*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))+arctanh(1/2*(1/(1+cos(d*x+c)))^(1/
2)*(cos(d*x+c)+1-sin(d*x+c)))*sin(d*x+c)-I*cos(d*x+c)*arctanh(1/2*(1/(1+cos
(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))-cos(d*x+c)*arctanh(1/2*(1/(1+cos
(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))-arctanh(1/2*(1/(1+cos(d*x+c)))^(
1/2)*(cos(d*x+c)+1+sin(d*x+c)))*sin(d*x+c)+I*arctanh(1/2*(1/(1+cos(d*x+c)))
^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))-arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos
(d*x+c)+1-sin(d*x+c)))-arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+s
in(d*x+c)))+8*(1/(1+cos(d*x+c)))^(1/2))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*
x+c))^(1/2)*cos(d*x+c)^3*(e/cos(d*x+c))^(5/2)/(2*I*cos(d*x+c)*sin(d*x+c)+2*
cos(d*x+c)^2-1)/(1/(1+cos(d*x+c)))^(5/2)/sin(d*x+c)^5/a^2
```

maxima [B] time = 1.32, size = 778, normalized size = 2.13

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxim
a")
```

```
[Out] -1/4*(2*I*sqrt(2)*e^2*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c) + 1, sqrt(2)*sin
(1/2*d*x + 1/2*c) + 1) + 2*I*sqrt(2)*e^2*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*
c) + 1, -sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) + 2*I*sqrt(2)*e^2*arctan2(sqrt(2
)*cos(1/2*d*x + 1/2*c) - 1, sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) + 2*I*sqrt(2)
*e^2*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c) - 1, -sqrt(2)*sin(1/2*d*x + 1/2*c
) + 1) + 2*sqrt(2)*e^2*arctan2(sqrt(2)*sin(1/2*d*x + 1/2*c) + sin(d*x + c),
 sqrt(2)*cos(1/2*d*x + 1/2*c) + cos(d*x + c) + 1) - 2*sqrt(2)*e^2*arctan2(-
sqrt(2)*sin(1/2*d*x + 1/2*c) + sin(d*x + c), -sqrt(2)*cos(1/2*d*x + 1/2*c)
+ cos(d*x + c) + 1) + I*sqrt(2)*e^2*log(2*sqrt(2)*sin(d*x + c)*sin(1/2*d*x
+ 1/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c) + 1)*cos(d*x + c) + cos(d*x + c)
^2 + 2*cos(1/2*d*x + 1/2*c)^2 + sin(d*x + c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 +
 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 1) - I*sqrt(2)*e^2*log(-2*sqrt(2)*sin(d*x
 + c)*sin(1/2*d*x + 1/2*c) - 2*(sqrt(2)*cos(1/2*d*x + 1/2*c) - 1)*cos(d*x +
 c) + cos(d*x + c)^2 + 2*cos(1/2*d*x + 1/2*c)^2 + sin(d*x + c)^2 + 2*sin(1/
2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 1) + sqrt(2)*e^2*log(2*
cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x +
 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*e^2*log(2*cos(1/2*d
*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) -
 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*e^2*log(2*cos(1/2*d*x + 1/2*
c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2
)*sin(1/2*d*x + 1/2*c) + 2) - sqrt(2)*e^2*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*
sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2
*d*x + 1/2*c) + 2) - 16*I*e^2*cos(1/2*d*x + 1/2*c) - 16*e^2*sin(1/2*d*x + 1
/2*c))*sqrt(e)/(a^(3/2)*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{5/2}}{\left(a+a\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(5/2)/(a + a*tan(c + d*x)*1i)^(3/2),x)
```

```
[Out] int((e/cos(c + d*x))^(5/2)/(a + a*tan(c + d*x)*1i)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(5/2)/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

3.425 $\int \frac{(e\sec(c+dx))^{3/2}}{(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=38

$$\frac{2i(e\sec(c+dx))^{3/2}}{3d(a+ia\tan(c+dx))^{3/2}}$$

```
[Out] 2/3*I*(e*sec(d*x+c))^(3/2)/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.08, antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.033, Rules used = {3488}

$$\frac{2i(e\sec(c+dx))^{3/2}}{3d(a+ia\tan(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(3/2)/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((2*I)/3)*(e*Sec[c + d*x])^(3/2))/(d*(a + I*a*Tan[c + d*x])^(3/2))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{3/2}}{(a+ia\tan(c+dx))^{3/2}}\,dx = \frac{2i(e\sec(c+dx))^{3/2}}{3d(a+ia\tan(c+dx))^{3/2}}$$

Mathematica [A] time = 0.10, size = 38, normalized size = 1.00

$$\frac{2i(e\sec(c+dx))^{3/2}}{3d(a+ia\tan(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(3/2)/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((2*I)/3)*(e*Sec[c + d*x])^(3/2))/(d*(a + I*a*Tan[c + d*x])^(3/2))
```

fricas [B] time = 0.67, size = 67, normalized size = 1.76

$$\frac{2\left(iee^{(2idx+2ic)}+ie\right)\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}\,e^{\left(-\frac{3}{2}idx-\frac{3}{2}ic\right)}}{3a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="frica
s")
```

```
[Out] 2/3*(I*e*e^(2*I*d*x + 2*I*c) + I*e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(
e/(e^(2*I*d*x + 2*I*c) + 1))*e^(-3/2*I*d*x - 3/2*I*c)/(a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{3}{2}}}{(ia\tan(dx+c)+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac"
)
```

```
[Out] integrate((e*sec(d*x + c))^(3/2)/(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [B] time = 1.11, size = 87, normalized size = 2.29

$$\frac{2i\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(\frac{e}{\cos(dx+c)}\right)^{\frac{3}{2}}\left(\cos^2(dx+c)\right)}{3d\left(2i\cos(dx+c)\sin(dx+c)+2\left(\cos^2(dx+c)\right)-1\right)a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] 2/3*I/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(e/cos(d*x+c))^(3/2)
*cos(d*x+c)^2/(2*I*cos(d*x+c)*sin(d*x+c)+2*cos(d*x+c)^2-1)/a^2
```

maxima [B] time = 0.79, size = 76, normalized size = 2.00

$$\frac{2ie^{\frac{3}{2}}\left(-\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-1\right)^{\frac{3}{2}}}{3a^{\frac{3}{2}}d\left(-\frac{2i\sin(dx+c)}{\cos(dx+c)+1}+\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-1\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxim
a")
```

```
[Out] 2/3*I*e^(3/2)*(-sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 1)^(3/2)/(a^(3/2)*d*(
-2*I*sin(d*x + c)/(cos(d*x + c) + 1) + sin(d*x + c)^2/(cos(d*x + c) + 1)^2
- 1)^(3/2))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{3/2}}{(a+a\tan(c+d\,x)\,1\mathrm{i})^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(3/2)/(a + a*tan(c + d*x)*1i)^(3/2),x)
```

```
[Out] int((e/cos(c + d*x))^(3/2)/(a + a*tan(c + d*x)*1i)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(c+dx))^{\frac{3}{2}}}{(ia(\tan(c+dx)-i))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(3/2)/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral((e*sec(c + d*x))**(3/2)/(I*a*(tan(c + d*x) - I))**(3/2), x)
```

3.426 $\int \frac{\sqrt{e\sec(c+dx)}}{(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=80

$$\frac{4i\sqrt{e\sec(c+dx)}}{5ad\sqrt{a+ia\tan(c+dx)}}+\frac{2i\sqrt{e\sec(c+dx)}}{5d(a+ia\tan(c+dx))^{3/2}}$$

```
[Out] 4/5*I*(e*sec(d*x+c))^(1/2)/a/d/(a+I*a*tan(d*x+c))^(1/2)+2/5*I*(e*sec(d*x+c)
)^(1/2)/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.14, antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {3502, 3488}

$$\frac{4i\sqrt{e\sec(c+dx)}}{5ad\sqrt{a+ia\tan(c+dx)}}+\frac{2i\sqrt{e\sec(c+dx)}}{5d(a+ia\tan(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Sec[c + d*x]]/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (((2*I)/5)*Sqrt[e*Sec[c + d*x]])/(d*(a + I*a*Tan[c + d*x])^(3/2)) + (((4*I)
/5)*Sqrt[e*Sec[c + d*x]])/(a*d*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\begin{aligned}\int \frac{\sqrt{e\sec(c+dx)}}{(a+ia\tan(c+dx))^{3/2}}\,dx &= \frac{2i\sqrt{e\sec(c+dx)}}{5d(a+ia\tan(c+dx))^{3/2}}+\frac{2\int \frac{\sqrt{e\sec(c+dx)}}{\sqrt{a+ia\tan(c+dx)}}\,dx}{5a}\\ &= \frac{2i\sqrt{e\sec(c+dx)}}{5d(a+ia\tan(c+dx))^{3/2}}+\frac{4i\sqrt{e\sec(c+dx)}}{5ad\sqrt{a+ia\tan(c+dx)}}\end{aligned}$$

Mathematica [A] time = 0.23, size = 63, normalized size = 0.79

$$\frac{2(3+2i\tan(c+dx))\sqrt{e\sec(c+dx)}}{5ad(\tan(c+dx)-i)\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Sec[c + d*x]]/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (2*Sqrt[e*Sec[c + d*x]]*(3 + (2*I)*Tan[c + d*x]))/(5*a*d*(-I + Tan[c + d*x]
)*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.54, size = 75, normalized size = 0.94

$$\frac{\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(5i\,e^{(4i\,dx+4i\,c)}+6i\,e^{(2i\,dx+2i\,c)}+i\right)e^{\left(-\frac{5}{2}i\,dx-\frac{5}{2}i\,c\right)}}{5\,a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="frica
s")
```

```
[Out] 1/5*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(5*
I*e^(4*I*d*x + 4*I*c) + 6*I*e^(2*I*d*x + 2*I*c) + I)*e^(-5/2*I*d*x - 5/2*I*
c)/(a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\sec\left(dx+c\right)}}{\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac"
)
```

```
[Out] integrate(sqrt(e*sec(d*x + c))/(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [A] time = 1.21, size = 101, normalized size = 1.26

$$-\frac{2i\cos\left(dx+c\right)\sqrt{\frac{e}{\cos(dx+c)}}\,\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\,\left(2i\left(\cos^2\left(dx+c\right)\right)\sin\left(dx+c\right)-2\left(\cos^3\left(dx+c\right)\right)+2i\sin\left(dx\right.}{5d\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] -2/5*I/d*cos(d*x+c)*(e/cos(d*x+c))^(1/2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d
*x+c))^(1/2)*(2*I*cos(d*x+c)^2*sin(d*x+c)-2*cos(d*x+c)^3+2*I*sin(d*x+c)-cos
(d*x+c))/a^2
```

maxima [A] time = 0.94, size = 80, normalized size = 1.00

$$\frac{\sqrt{e}\left(i\cos\left(\frac{5}{2}dx+\frac{5}{2}c\right)+5i\cos\left(\frac{1}{5}\arctan\left(\sin\left(\frac{5}{2}dx+\frac{5}{2}c\right),\cos\left(\frac{5}{2}dx+\frac{5}{2}c\right)\right)\right)+\sin\left(\frac{5}{2}dx+\frac{5}{2}c\right)+5\sin\left(\frac{1}{5}\operatorname{arct}\right.}{5\,a^{\frac{3}{2}}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxim
a")
```

```
[Out] 1/5*sqrt(e)*(I*cos(5/2*d*x + 5/2*c) + 5*I*cos(1/5*arctan2(sin(5/2*d*x + 5/2
*c), cos(5/2*d*x + 5/2*c))) + sin(5/2*d*x + 5/2*c) + 5*sin(1/5*arctan2(sin(
5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))))/(a^(3/2)*d)
```

mupad [B] time = 3.94, size = 84, normalized size = 1.05

$$\frac{\sqrt{\frac{e}{\cos(c+d\,x)}}\,\left(\cos\left(2\,c+2\,d\,x\right)\,1\mathrm{i}+\sin\left(2\,c+2\,d\,x\right)+5\mathrm{i}\right)}{5\,a\,d\,\sqrt{\frac{a\,\left(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i}\right)}{\cos(2\,c+2\,d\,x)+1}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(1/2)/(a + a*tan(c + d*x)*1i)^(3/2),x)
```

```
[Out] ((e/cos(c + d*x))^(1/2)*(cos(2*c + 2*d*x)*1i + sin(2*c + 2*d*x) + 5i))/(5*a
*d*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1)
)^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e \sec (c + dx)}}{(ia (\tan (c + dx) - i))^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(1/2)/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral(sqrt(e*sec(c + d*x))/(I*a*(tan(c + d*x) - I))**(3/2), x)
```

3.427 $\int \frac{1}{\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=121

$$-\frac{16i\sqrt{a+ia\tan(c+dx)}}{21a^2d\sqrt{e\sec(c+dx)}}+\frac{8i}{21ad\sqrt{a+ia\tan(c+dx)}\,\sqrt{e\sec(c+dx)}}+\frac{2i}{7d(a+ia\tan(c+dx))^{3/2}\sqrt{e\sec(c+dx)}}$$

```
[Out] 8/21*I/a/d/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)-16/21*I*(a+I*a*tan
(d*x+c))^(1/2)/a^2/d/(e*sec(d*x+c))^(1/2)+2/7*I/d/(e*sec(d*x+c))^(1/2)/(a+I
*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.21, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {3502, 3488}

$$-\frac{16i\sqrt{a+ia\tan(c+dx)}}{21a^2d\sqrt{e\sec(c+dx)}}+\frac{8i}{21ad\sqrt{a+ia\tan(c+dx)}\,\sqrt{e\sec(c+dx)}}+\frac{2i}{7d(a+ia\tan(c+dx))^{3/2}\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^(3/2)),x]
```

```
[Out] ((2*I)/7)/(d*Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^(3/2)) + ((8*I)/21
)/(a*d*Sqrt[e*Sec[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) - (((16*I)/21)*Sqrt
[a + I*a*Tan[c + d*x]])/(a^2*d*Sqrt[e*Sec[c + d*x]])
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{1}{\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^{3/2}}\,dx = \frac{2i}{7d\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^{3/2}}+\frac{4\int \frac{1}{\sqrt{e\sec(c+dx)}\,\sqrt{a+ia\tan(c}}}{7a}$$

$$=\frac{2i}{7d\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^{3/2}}+\frac{8i}{21ad\sqrt{e\sec(c+dx)}\,\sqrt{a}}$$

$$=\frac{2i}{7d\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^{3/2}}+\frac{8i}{21ad\sqrt{e\sec(c+dx)}\,\sqrt{a}}$$

Mathematica [A] time = 0.31, size = 83, normalized size = 0.69

$$-\frac{\sec^2(c+dx)(12i\sin(2(c+dx))+9\cos(2(c+dx))-7)}{21ad(\tan(c+dx)-i)\sqrt{a+ia\tan(c+dx)}\,\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^(3/2)),x]
```

```
[Out] -1/21*(Sec[c + d*x]^2*(-7 + 9*Cos[2*(c + d*x)] + (12*I)*Sin[2*(c + d*x)]))/
(a*d*Sqrt[e*Sec[c + d*x]]*(-I + Tan[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.50, size = 89, normalized size = 0.74

$$\frac{\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(-21i\,e^{(6i\,dx+6i\,c)}-7i\,e^{(4i\,dx+4i\,c)}+17i\,e^{(2i\,dx+2i\,c)}+3i\right)e^{\left(-\frac{7}{2}i\,dx-\frac{7}{2}i\,c\right)}}{42\,a^2de}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fri
cas")
```

```
[Out] 1/42*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(-
21*I*e^(6*I*d*x + 6*I*c) - 7*I*e^(4*I*d*x + 4*I*c) + 17*I*e^(2*I*d*x + 2*I*
c) + 3*I)*e^(-7/2*I*d*x - 7/2*I*c)/(a^2*d*e)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{e\sec\left(dx+c\right)}\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="gia
c")
```

```
[Out] integrate(1/(sqrt(e*sec(d*x + c))*(I*a*tan(d*x + c) + a)^(3/2)), x)
```

maple [A] time = 1.23, size = 106, normalized size = 0.88

$$-\frac{2\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(9i\left(\cos^2\left(dx+c\right)\right)-12\cos\left(dx+c\right)\sin\left(dx+c\right)-8i\right)}{21d\left(2i\cos\left(dx+c\right)\sin\left(dx+c\right)+2\left(\cos^2\left(dx+c\right)\right)-1\right)\sqrt{\frac{e}{\cos(dx+c)}}\;a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] -2/21/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(9*I*cos(d*x+c)^2-12
*cos(d*x+c)*sin(d*x+c)-8*I)/(2*I*cos(d*x+c)*sin(d*x+c)+2*cos(d*x+c)^2-1)/(e
/cos(d*x+c))^(1/2)/a^2
```

maxima [A] time = 0.96, size = 130, normalized size = 1.07

$$\frac{3i\,\cos\left(\frac{7}{2}\,dx+\frac{7}{2}\,c\right)+14i\,\cos\left(\frac{3}{7}\,\arctan\left(\sin\left(\frac{7}{2}\,dx+\frac{7}{2}\,c\right),\cos\left(\frac{7}{2}\,dx+\frac{7}{2}\,c\right)\right)\right)-21i\,\cos\left(\frac{1}{7}\,\arctan\left(\sin\left(\frac{7}{2}\,dx+\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="max
ima")
```

```
[Out] 1/42*(3*I*cos(7/2*d*x + 7/2*c) + 14*I*cos(3/7*arctan2(sin(7/2*d*x + 7/2*c),
 cos(7/2*d*x + 7/2*c))) - 21*I*cos(1/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/
2*d*x + 7/2*c))) + 3*sin(7/2*d*x + 7/2*c) + 14*sin(3/7*arctan2(sin(7/2*d*x
```

```
+ 7/2*c), cos(7/2*d*x + 7/2*c))) + 21*sin(1/7*arctan2(sin(7/2*d*x + 7/2*c),
 cos(7/2*d*x + 7/2*c))))/(a^(3/2)*d*sqrt(e))
```

mupad [B] time = 4.16, size = 104, normalized size = 0.86

$$\frac{\sqrt{\frac{e}{\cos(c+d\,x)}}\,\left(35\,\sin\left(c+d\,x\right)+3\,\sin\left(3\,c+3\,d\,x\right)-\cos\left(c+d\,x\right)\,7\mathrm{i}+\cos\left(3\,c+3\,d\,x\right)\,3\mathrm{i}\right)}{42\,a\,d\,e\,\sqrt{\frac{a\,\left(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i}\right)}{\cos(2\,c+2\,d\,x)+1}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^(3/2)),x)
```

```
[Out] ((e/cos(c + d*x))^(1/2)*(35*sin(c + d*x) - cos(c + d*x)*7i + cos(3*c + 3*d*
x)*3i + 3*sin(3*c + 3*d*x)))/(42*a*d*e*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*
d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{e\sec\left(c+dx\right)}\,\left(ia\left(\tan\left(c+dx\right)-i\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))**(1/2)/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral(1/(sqrt(e*sec(c + d*x))*(I*a*(tan(c + d*x) - I))**(3/2)), x)
```

3.428 $\int \frac{1}{(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=165

$$-\frac{16i\sqrt{a+ia\tan(c+dx)}}{45a^2d(e\sec(c+dx))^{3/2}}+\frac{32i\sqrt{e\sec(c+dx)}}{45ade^2\sqrt{a+ia\tan(c+dx)}}+\frac{4i}{15ad\sqrt{a+ia\tan(c+dx)}\,(e\sec(c+dx))^{3/2}}+\frac{}{9d(a+ia\tan}$$

```
[Out] 4/15*I/a/d/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2)+32/45*I*(e*sec(d*x
+c))^(1/2)/a/d/e^2/(a+I*a*tan(d*x+c))^(1/2)-16/45*I*(a+I*a*tan(d*x+c))^(1/2
)/a^2/d/(e*sec(d*x+c))^(3/2)+2/9*I/d/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c)
)^(3/2)
```

Rubi [A] time = 0.31, antiderivative size = 165, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {3502, 3497, 3488}

$$-\frac{16i\sqrt{a+ia\tan(c+dx)}}{45a^2d(e\sec(c+dx))^{3/2}}+\frac{32i\sqrt{e\sec(c+dx)}}{45ade^2\sqrt{a+ia\tan(c+dx)}}+\frac{4i}{15ad\sqrt{a+ia\tan(c+dx)}\,(e\sec(c+dx))^{3/2}}+\frac{}{9d(a+ia\tan}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^(3/2)),x]
```

```
[Out] ((2*I)/9)/(d*(e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^(3/2)) + ((4*I)/
15)/(a*d*(e*Sec[c + d*x])^(3/2)*Sqrt[a + I*a*Tan[c + d*x]]) + (((32*I)/45)*
Sqrt[e*Sec[c + d*x]])/(a*d*e^2*Sqrt[a + I*a*Tan[c + d*x]]) - (((16*I)/45)*S
qrt[a + I*a*Tan[c + d*x]])/(a^2*d*(e*Sec[c + d*x])^(3/2))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{1}{(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^{3/2}}\,dx = \frac{2i}{9d(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^{3/2}} + \frac{2\int \frac{1}{(e\sec(c+dx))^{3/2}\sqrt{a+i\ldots}}}{3a}$$
$$= \frac{2i}{9d(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^{3/2}} + \frac{\ldots}{15ad(e\sec(c+dx))^{3\ldots}}$$
$$= \frac{2i}{9d(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^{3/2}} + \frac{\ldots}{15ad(e\sec(c+dx))^{3\ldots}}$$
$$= \frac{2i}{9d(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^{3/2}} + \frac{\ldots}{15ad(e\sec(c+dx))^{3\ldots}}$$

Mathematica [A] time = 0.48, size = 100, normalized size = 0.61

$$-\frac{\sec^3(c+dx)(-54i\sin(c+dx)+10i\sin(3(c+dx))-81\cos(c+dx)+5\cos(3(c+dx)))}{90ad(\tan(c+dx)-i)\sqrt{a+ia\tan(c+dx)}\,(e\sec(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^(3/2)),x]
```

```
[Out] -1/90*(Sec[c + d*x]^3*(-81*Cos[c + d*x] + 5*Cos[3*(c + d*x)] - (54*I)*Sin[c
 + d*x] + (10*I)*Sin[3*(c + d*x)]))/(a*d*(e*Sec[c + d*x])^(3/2)*(-I + Tan[c
 + d*x])*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.70, size = 100, normalized size = 0.61

$$\frac{\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(-15i\,e^{(8i\,dx+8i\,c)}+120i\,e^{(6i\,dx+6i\,c)}+162i\,e^{(4i\,dx+4i\,c)}+32i\,e^{(2i\,dx+2i\,c)}+5i\right)e^{\left(-\frac{9}{2}i\,dx-\frac{9}{2}i\,c\right)}}{180\,a^2de^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fri
cas")
```

```
[Out] 1/180*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(
-15*I*e^(8*I*d*x + 8*I*c) + 120*I*e^(6*I*d*x + 6*I*c) + 162*I*e^(4*I*d*x +
4*I*c) + 32*I*e^(2*I*d*x + 2*I*c) + 5*I)*e^(-9/2*I*d*x - 9/2*I*c)/(a^2*d*e^
2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\sec(dx+c))^{\frac{3}{2}}(i\,a\tan(dx+c)+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="gia
c")
```

```
[Out] integrate(1/((e*sec(d*x + c))^(3/2)*(I*a*tan(d*x + c) + a)^(3/2)), x)
```

maple [A] time = 1.18, size = 132, normalized size = 0.80

$$\frac{2\left(\cos^2(dx+c)\right)\left(\frac{e}{\cos(dx+c)}\right)^{\frac{3}{2}}\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(10i\left(\cos^5(dx+c)\right)+10\sin(dx+c)\left(\cos^4(dx+c)\right)+i\left(\cos\ldots\right.\right.}{45d\,e^3a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] 2/45/d*cos(d*x+c)^2*(e/cos(d*x+c))^(3/2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d
*x+c))^(1/2)*(10*I*cos(d*x+c)^5+10*sin(d*x+c)*cos(d*x+c)^4+I*cos(d*x+c)^3+6
*cos(d*x+c)^2*sin(d*x+c)+8*I*cos(d*x+c)+16*sin(d*x+c))/e^3/a^2
```

maxima [A] time = 1.17, size = 178, normalized size = 1.08

$$5i\cos\left(\frac{9}{2}dx+\frac{9}{2}c\right)+27i\cos\left(\frac{5}{9}\arctan\left(\sin\left(\frac{9}{2}dx+\frac{9}{2}c\right),\cos\left(\frac{9}{2}dx+\frac{9}{2}c\right)\right)\right)-15i\cos\left(\frac{1}{3}\arctan\left(\sin\left(\frac{9}{2}dx+\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="max
ima")
```

```
[Out] 1/180*(5*I*cos(9/2*d*x + 9/2*c) + 27*I*cos(5/9*arctan2(sin(9/2*d*x + 9/2*c)
, cos(9/2*d*x + 9/2*c))) - 15*I*cos(1/3*arctan2(sin(9/2*d*x + 9/2*c), cos(9
/2*d*x + 9/2*c))) + 135*I*cos(1/9*arctan2(sin(9/2*d*x + 9/2*c), cos(9/2*d*x
 + 9/2*c))) + 5*sin(9/2*d*x + 9/2*c) + 27*sin(5/9*arctan2(sin(9/2*d*x + 9/2
*c), cos(9/2*d*x + 9/2*c))) + 15*sin(1/3*arctan2(sin(9/2*d*x + 9/2*c), cos(
9/2*d*x + 9/2*c))) + 135*sin(1/9*arctan2(sin(9/2*d*x + 9/2*c), cos(9/2*d*x
+ 9/2*c))))/(a^(3/2)*d*e^(3/2))
```

mupad [B] time = 4.20, size = 112, normalized size = 0.68

$$\frac{\sqrt{\frac{e}{\cos(c+d\,x)}}\,\left(\cos\left(2\,c+2\,d\,x\right)\,12\mathrm{i}+\cos\left(4\,c+4\,d\,x\right)\,5\mathrm{i}+42\,\sin\left(2\,c+2\,d\,x\right)+5\,\sin\left(4\,c+4\,d\,x\right)+135\mathrm{i}\right)}{180\,a\,d\,e^2\,\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^(3/2)),x)
```

```
[Out] ((e/cos(c + d*x))^(1/2)*(cos(2*c + 2*d*x)*12i + cos(4*c + 4*d*x)*5i + 42*si
n(2*c + 2*d*x) + 5*sin(4*c + 4*d*x) + 135i))/(180*a*d*e^2*((a*(cos(2*c + 2*
d*x) + sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\sec(c+dx))^{\frac{3}{2}}\,(ia(\tan(c+dx)-i))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))**(3/2)/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral(1/((e*sec(c + d*x))**(3/2)*(I*a*(tan(c + d*x) - I))**(3/2)), x)
```

3.429 $\int \frac{1}{(e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=209

$$-\frac{256i\sqrt{a+ia\tan(c+dx)}}{385a^2de^2\sqrt{e\sec(c+dx)}}-\frac{96i\sqrt{a+ia\tan(c+dx)}}{385a^2d(e\sec(c+dx))^{5/2}}+\frac{128i}{385ade^2\sqrt{a+ia\tan(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{}{77ad\sqrt{a+ia}}$$

```
[Out] 16/77*I/a/d/(e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(1/2)+128/385*I/a/d/e^2
/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)-96/385*I*(a+I*a*tan(d*x+c))^
(1/2)/a^2/d/(e*sec(d*x+c))^(5/2)-256/385*I*(a+I*a*tan(d*x+c))^(1/2)/a^2/d/e
^2/(e*sec(d*x+c))^(1/2)+2/11*I/d/(e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(3
/2)
```

Rubi [A] time = 0.39, antiderivative size = 209, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {3502, 3497, 3488}

$$-\frac{256i\sqrt{a+ia\tan(c+dx)}}{385a^2de^2\sqrt{e\sec(c+dx)}}-\frac{96i\sqrt{a+ia\tan(c+dx)}}{385a^2d(e\sec(c+dx))^{5/2}}+\frac{128i}{385ade^2\sqrt{a+ia\tan(c+dx)}\sqrt{e\sec(c+dx)}}+\frac{}{77ad\sqrt{a+ia}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Sec[c + d*x])^(5/2)*(a + I*a*Tan[c + d*x])^(3/2)),x]
```

```
[Out] ((2*I)/11)/(d*(e*Sec[c + d*x])^(5/2)*(a + I*a*Tan[c + d*x])^(3/2)) + ((16*I
)/77)/(a*d*(e*Sec[c + d*x])^(5/2)*Sqrt[a + I*a*Tan[c + d*x]]) + ((128*I)/38
5)/(a*d*e^2*Sqrt[e*Sec[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) - (((96*I)/385
)*Sqrt[a + I*a*Tan[c + d*x]])/(a^2*d*(e*Sec[c + d*x])^(5/2)) - (((256*I)/38
5)*Sqrt[a + I*a*Tan[c + d*x]])/(a^2*d*e^2*Sqrt[e*Sec[c + d*x]])
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{1}{(e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))^{3/2}}\,dx = \frac{2i}{11d(e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))^{3/2}} + \frac{8\int \frac{}{(e\sec(c+dx))^{5/2}}}{11}$$

$$= \frac{2i}{11d(e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))^{3/2}} + \frac{}{77ad(e\sec(c+d}$$

$$= \frac{2i}{11d(e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))^{3/2}} + \frac{}{77ad(e\sec(c+d}$$

$$= \frac{2i}{11d(e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))^{3/2}} + \frac{}{77ad(e\sec(c+d}$$

$$= \frac{2i}{11d(e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))^{3/2}} + \frac{}{77ad(e\sec(c+d}$$

Mathematica [A] time = 0.55, size = 100, normalized size = 0.48

$$-\frac{(e\sec(c+dx))^{3/2}(880i\sin(2(c+dx))+56i\sin(4(c+dx))+660\cos(2(c+dx))+21\cos(4(c+dx))-385)}{1540ade^4(\tan(c+dx)-i)\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Sec[c + d*x])^(5/2)*(a + I*a*Tan[c + d*x])^(3/2)),x]
```

```
[Out] -1/1540*((e*Sec[c + d*x])^(3/2)*(-385 + 660*Cos[2*(c + d*x)] + 21*Cos[4*(c
+ d*x)] + (880*I)*Sin[2*(c + d*x)] + (56*I)*Sin[4*(c + d*x)]))/(a*d*e^4*(-I
 + Tan[c + d*x])*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.66, size = 111, normalized size = 0.53

$$\frac{\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(-77i\,e^{(10i\,dx+10i\,c)}-1617i\,e^{(8i\,dx+8i\,c)}-770i\,e^{(6i\,dx+6i\,c)}+990i\,e^{(4i\,dx+4i\,c)}+255i\,e^{(2i\,dx+2}\right.}{3080\,a^2de^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fri
cas")
```

```
[Out] 1/3080*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*
(-77*I*e^(10*I*d*x + 10*I*c) - 1617*I*e^(8*I*d*x + 8*I*c) - 770*I*e^(6*I*d*
x + 6*I*c) + 990*I*e^(4*I*d*x + 4*I*c) + 255*I*e^(2*I*d*x + 2*I*c) + 35*I)*
e^(-11/2*I*d*x - 11/2*I*c)/(a^2*d*e^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\sec(dx+c))^{\frac{5}{2}}(i\,a\tan(dx+c)+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="gia
c")
```

```
[Out] integrate(1/((e*sec(d*x + c))^(5/2)*(I*a*tan(d*x + c) + a)^(3/2)), x)
```

maple [A] time = 1.17, size = 142, normalized size = 0.68

$$\frac{2\left(\cos^3(dx+c)\right)\left(\frac{e}{\cos(dx+c)}\right)^{\frac{5}{2}}\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\,\left(70i\left(\cos^6(dx+c)\right)+70\left(\cos^5(dx+c)\right)\sin(dx+c)+5i\left(\mathrm{co}\right.\right.}{385d\,e^5a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] 2/385/d*cos(d*x+c)^3*(e/cos(d*x+c))^(5/2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(
d*x+c))^(1/2)*(70*I*cos(d*x+c)^6+70*cos(d*x+c)^5*sin(d*x+c)+5*I*cos(d*x+c)^
4+40*cos(d*x+c)^3*sin(d*x+c)+16*I*cos(d*x+c)^2+64*cos(d*x+c)*sin(d*x+c)-128
*I)/e^5/a^2
```

maxima [A] time = 1.16, size = 226, normalized size = 1.08

$$\frac{35i\cos\left(\frac{11}{2}dx+\frac{11}{2}c\right)+220i\cos\left(\frac{7}{11}\arctan\left(\sin\left(\frac{11}{2}dx+\frac{11}{2}c\right),\cos\left(\frac{11}{2}dx+\frac{11}{2}c\right)\right)\right)-77i\cos\left(\frac{5}{11}\arctan\left(\sin\left(\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="max
ima")
```

```
[Out] 1/3080*(35*I*cos(11/2*d*x + 11/2*c) + 220*I*cos(7/11*arctan2(sin(11/2*d*x +
 11/2*c), cos(11/2*d*x + 11/2*c))) - 77*I*cos(5/11*arctan2(sin(11/2*d*x + 1
1/2*c), cos(11/2*d*x + 11/2*c))) + 770*I*cos(3/11*arctan2(sin(11/2*d*x + 11
/2*c), cos(11/2*d*x + 11/2*c))) - 1540*I*cos(1/11*arctan2(sin(11/2*d*x + 11
/2*c), cos(11/2*d*x + 11/2*c))) + 35*sin(11/2*d*x + 11/2*c) + 220*sin(7/11*
arctan2(sin(11/2*d*x + 11/2*c), cos(11/2*d*x + 11/2*c))) + 77*sin(5/11*arct
an2(sin(11/2*d*x + 11/2*c), cos(11/2*d*x + 11/2*c))) + 770*sin(3/11*arctan2
(sin(11/2*d*x + 11/2*c), cos(11/2*d*x + 11/2*c))) + 1540*sin(1/11*arctan2(s
in(11/2*d*x + 11/2*c), cos(11/2*d*x + 11/2*c))))/(a^(3/2)*d*e^(5/2))
```

mupad [B] time = 4.57, size = 127, normalized size = 0.61

$$\frac{\sqrt{\frac{e}{\cos(c+d\,x)}}\,\left(2310\,\sin(c+d\,x)+297\,\sin(3\,c+3\,d\,x)+35\,\sin(5\,c+5\,d\,x)-\cos(c+d\,x)\,770\mathrm{i}+\cos(3\,c+3\,d\,x)\right.}{3080\,a\,d\,e^3\,\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e/cos(c + d*x))^(5/2)*(a + a*tan(c + d*x)*1i)^(3/2)),x)
```

```
[Out] ((e/cos(c + d*x))^(1/2)*(2310*sin(c + d*x) - cos(c + d*x)*770i + cos(3*c +
3*d*x)*143i + cos(5*c + 5*d*x)*35i + 297*sin(3*c + 3*d*x) + 35*sin(5*c + 5*
d*x)))/(3080*a*d*e^3*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))/(cos
(2*c + 2*d*x) + 1))^(1/2))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))**(5/2)/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Timed out
```

3.430 $\int \frac{(e\sec(c+dx))^{9/2}}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=411

$$-\frac{5ie^{9/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\,a^{5/2}d}+\frac{5ie^{9/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\,a^{5/2}d}+\frac{5ie^{9/2}\log\left(-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a+ia\tan(c+}{\sqrt{e\sec(c+dx)}}\right.}{}$$

```
[Out] -5/2*I*e^(9/2)*arctan(1-2^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e
*sec(d*x+c))^(1/2))/a^(5/2)/d*2^(1/2)+5/2*I*e^(9/2)*arctan(1+2^(1/2)*e^(1/2
)*(a+I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*sec(d*x+c))^(1/2))/a^(5/2)/d*2^(1/2)+
5/4*I*e^(9/2)*ln(a-2^(1/2)*a^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/(e*sec(
d*x+c))^(1/2)+cos(d*x+c)*(a+I*a*tan(d*x+c)))/a^(5/2)/d*2^(1/2)-5/4*I*e^(9/2
)*ln(a+2^(1/2)*a^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2
)+cos(d*x+c)*(a+I*a*tan(d*x+c)))/a^(5/2)/d*2^(1/2)+5*I*e^4*(e*sec(d*x+c))^(
1/2)*(a+I*a*tan(d*x+c))^(1/2)/a^3/d+4*I*e^2*(e*sec(d*x+c))^(5/2)/a/d/(a+I*a
*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.43, antiderivative size = 411, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {3500, 3501, 3495, 297, 1162, 617, 204, 1165, 628}

$$-\frac{5ie^{9/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\,a^{5/2}d}+\frac{5ie^{9/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\,a^{5/2}d}+\frac{5ie^4\sqrt{a+ia\tan(c+dx)}\sqrt{e\sec}}{a^3d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(9/2)/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((-5*I)*e^(9/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]])/(Sq
rt[a]*Sqrt[e*Sec[c + d*x]])]])/(Sqrt[2]*a^(5/2)*d) + ((5*I)*e^(9/2)*ArcTan[1
 + (Sqrt[2]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d*x
]])])/(Sqrt[2]*a^(5/2)*d) + (((5*I)/2)*e^(9/2)*Log[a - (Sqrt[2]*Sqrt[a]*Sqr
t[e]*Sqrt[a + I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a + I
*a*Tan[c + d*x])])/(Sqrt[2]*a^(5/2)*d) - (((5*I)/2)*e^(9/2)*Log[a + (Sqrt[2
]*Sqrt[a]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c
+ d*x]*(a + I*a*Tan[c + d*x])])/(Sqrt[2]*a^(5/2)*d) + ((4*I)*e^2*(e*Sec[c +
 d*x])^(5/2))/(a*d*(a + I*a*Tan[c + d*x])^(3/2)) + ((5*I)*e^4*Sqrt[e*Sec[c
+ d*x]]*Sqrt[a + I*a*Tan[c + d*x]])/(a^3*d)
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
```

```
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3495

```
Int[Sqrt[(d_.)*sec[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[(-4*b*d^2)/f, Subst[Int[x^2/(a^2 + d^2*x^4), x],
 x, Sqrt[a + b*Tan[e + f*x]]/Sqrt[d*Sec[e + f*x]]], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{9/2}}{(a+ia\tan(c+dx))^{5/2}}dx = \frac{4ie^2(e\sec(c+dx))^{5/2}}{ad(a+ia\tan(c+dx))^{3/2}} - \frac{\left(5e^2\right)\int \frac{(e\sec(c+dx))^{5/2}}{\sqrt{a+ia\tan(c+dx)}}dx}{a^2}$$

$$= \frac{4ie^2(e\sec(c+dx))^{5/2}}{ad(a+ia\tan(c+dx))^{3/2}} + \frac{5ie^4\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}}{a^3d} - \frac{\left(5e^4\right)\int \surd$$

$$= \frac{4ie^2(e\sec(c+dx))^{5/2}}{ad(a+ia\tan(c+dx))^{3/2}} + \frac{5ie^4\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}}{a^3d} + \frac{\left(10ie^6\right)\mathrm{S}$$

$$= \frac{4ie^2(e\sec(c+dx))^{5/2}}{ad(a+ia\tan(c+dx))^{3/2}} + \frac{5ie^4\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}}{a^3d} - \frac{\left(5ie^5\right)\mathrm{Su}$$

$$= \frac{4ie^2(e\sec(c+dx))^{5/2}}{ad(a+ia\tan(c+dx))^{3/2}} + \frac{5ie^4\sqrt{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}}{a^3d} + \frac{\left(5ie^4\right)\mathrm{Su}$$

$$= \frac{5ie^{9/2}\log\left(a - \frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}} + \cos(c+dx)(a+ia\tan(c+dx))\right)}{2\sqrt{2}a^{5/2}d} - \frac{5ie^{9/}$$

$$= -\frac{5ie^{9/2}\tan^{-1}\left(1 - \frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}a^{5/2}d} + \frac{5ie^{9/2}\tan^{-1}\left(1 + \frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}a^{5/2}d}$$

Mathematica [A] time = 5.81, size = 370, normalized size = 0.90

$$\frac{e^2(\cos(dx)+i\sin(dx))^3(e\sec(c+dx))^{5/2}\left((-8\sin(2c)+8i\cos(2c))\cos(dx)+8(\cos(2c)+i\sin(2c))\sin(dx)+\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(9/2)/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (e^2*(e*Sec[c + d*x])^(5/2)*(Cos[d*x] + I*Sin[d*x])^3*(Cos[d*x]*((8*I)*Cos[
2*c] - 8*Sin[2*c]) + Sec[c + d*x]*(I*Cos[3*c] - Sin[3*c]) + 8*(Cos[2*c] + I
*Sin[2*c])*Sin[d*x] + (5*(ArcTanh[(Sqrt[1 - I*Cos[c] + Sin[c]]*Sqrt[I - Tan
[(d*x)/2]])/(Sqrt[-1 - I*Cos[c] - Sin[c]]*Sqrt[I + Tan[(d*x)/2]])]*Sqrt[-1
- I*Cos[c] - Sin[c]]*Sqrt[1 + I*Cos[c] - Sin[c]] - ArcTanh[(Sqrt[1 + I*Cos[
c] - Sin[c]]*Sqrt[I - Tan[(d*x)/2]])/(Sqrt[-1 + I*Cos[c] + Sin[c]]*Sqrt[I +
 Tan[(d*x)/2]])]*Sqrt[1 - I*Cos[c] + Sin[c]]*Sqrt[-1 + I*Cos[c] + Sin[c]])*
(Cos[3*c] + I*Sin[3*c])*Sqrt[I + Tan[(d*x)/2]])/(Sqrt[1 + Cos[2*c] + I*Sin[
2*c]]*Sqrt[I - Tan[(d*x)/2]])))/(d*(a + I*a*Tan[c + d*x])^(5/2))
```

fricas [A] time = 0.71, size = 541, normalized size = 1.32

$$-\frac{\left(\sqrt{\frac{25ie^9}{a^5d^2}}a^3de^{(idx+ic)}\log\left(\frac{2\left(\sqrt{\frac{25ie^9}{a^5d^2}}a^3d+5\left(e^4e^{(2idx+2ic)}+e^4\right)\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}e^{\left(\frac{1}{2}idx+\frac{1}{2}ic\right)}\right)}{5e^4}\right) - \sqrt{\frac{25ie^9}{a^5d^2}}a^3de^{(idx+ic)}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(9/2)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="frica
s")
```

```
[Out] -1/2*(sqrt(25*I*e^9/(a^5*d^2))*a^3*d*e^(I*d*x + I*c)*log(2/5*(sqrt(25*I*e^9
/(a^5*d^2))*a^3*d + 5*(e^4*e^(2*I*d*x + 2*I*c) + e^4)*sqrt(a/(e^(2*I*d*x +
2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))/e^4
) - sqrt(25*I*e^9/(a^5*d^2))*a^3*d*e^(I*d*x + I*c)*log(-2/5*(sqrt(25*I*e^9/
(a^5*d^2))*a^3*d - 5*(e^4*e^(2*I*d*x + 2*I*c) + e^4)*sqrt(a/(e^(2*I*d*x + 2
*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))/e^4)
 - sqrt(-25*I*e^9/(a^5*d^2))*a^3*d*e^(I*d*x + I*c)*log(2/5*(sqrt(-25*I*e^9/
(a^5*d^2))*a^3*d + 5*(e^4*e^(2*I*d*x + 2*I*c) + e^4)*sqrt(a/(e^(2*I*d*x + 2
*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))/e^4)
 + sqrt(-25*I*e^9/(a^5*d^2))*a^3*d*e^(I*d*x + I*c)*log(-2/5*(sqrt(-25*I*e^9
/(a^5*d^2))*a^3*d - 5*(e^4*e^(2*I*d*x + 2*I*c) + e^4)*sqrt(a/(e^(2*I*d*x +
2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))/e^4
) - 2*(10*I*e^4*e^(2*I*d*x + 2*I*c) + 8*I*e^4)*sqrt(a/(e^(2*I*d*x + 2*I*c)
+ 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))*e^(-I*d*x
- I*c)/(a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e \sec(dx+c))^{\frac{9}{2}}}{(i a \tan(dx+c)+a)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(9/2)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac"
)
```

```
[Out] integrate((e*sec(d*x + c))^(9/2)/(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [B] time = 1.15, size = 1439, normalized size = 3.50

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(9/2)/(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 1/4/d*(-1+cos(d*x+c))^4*(-20*I*cos(d*x+c)^3*sin(d*x+c)*arctanh(1/2*(1/(1+co
s(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))-44*I*cos(d*x+c)*sin(d*x+c)*(1/(
1+cos(d*x+c)))^(1/2)+5*I*cos(d*x+c)*sin(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)
))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))+10*I*cos(d*x+c)^2*sin(d*x+c)*arctanh(1/
2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+10*I*cos(d*x+c)^2*sin
(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))+5*I
*cos(d*x+c)*sin(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+s
in(d*x+c)))+80*I*cos(d*x+c)^3*sin(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)-20*I*cos(
d*x+c)^3*sin(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(
d*x+c)))+4*(1/(1+cos(d*x+c)))^(1/2)-10*cos(d*x+c)^2*sin(d*x+c)*arctanh(1/2*
(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))+10*cos(d*x+c)^2*sin(d*x
+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))-5*cos(d
*x+c)*sin(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x
+c)))+5*cos(d*x+c)*sin(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x
+c)+1+sin(d*x+c)))+20*I*cos(d*x+c)^4*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(
cos(d*x+c)+1+sin(d*x+c)))-20*I*cos(d*x+c)^4*arctanh(1/2*(1/(1+cos(d*x+c)))^
(1/2)*(cos(d*x+c)+1-sin(d*x+c)))-10*I*cos(d*x+c)^3*arctanh(1/2*(1/(1+cos(d*
x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+10*I*cos(d*x+c)^3*arctanh(1/2*(1/(1
+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))-15*I*cos(d*x+c)^2*arctanh(1/
2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+15*I*cos(d*x+c)^2*arc
tanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))+5*I*arctanh(1/
2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))*cos(d*x+c)-5*I*cos(d*
```

```
x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))+20*cos
(d*x+c)^3*sin(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin
(d*x+c)))-20*cos(d*x+c)^3*sin(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(
cos(d*x+c)+1+sin(d*x+c)))+10*cos(d*x+c)^3*arctanh(1/2*(1/(1+cos(d*x+c)))^(1
/2)*(cos(d*x+c)+1+sin(d*x+c)))+10*cos(d*x+c)^3*arctanh(1/2*(1/(1+cos(d*x+c)
))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))-84*cos(d*x+c)^2*(1/(1+cos(d*x+c)))^(1/2
)+15*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*
x+c)))+15*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-s
in(d*x+c)))-5*cos(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1
-sin(d*x+c)))-5*cos(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)
+1+sin(d*x+c)))-20*cos(d*x+c)^4*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d
*x+c)+1-sin(d*x+c)))-20*cos(d*x+c)^4*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(
cos(d*x+c)+1+sin(d*x+c)))+80*cos(d*x+c)^4*(1/(1+cos(d*x+c)))^(1/2))*(a*(I*s
in(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*cos(d*x+c)^4*(e/cos(d*x+c))^(9/2)/(
4*I*sin(d*x+c)*cos(d*x+c)^2+4*cos(d*x+c)^3-I*sin(d*x+c)-3*cos(d*x+c))/sin(d
*x+c)^9/(1/(1+cos(d*x+c)))^(9/2)/a^3
```

maxima [B] time = 1.29, size = 2453, normalized size = 5.97

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(9/2)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxim
a")
```

```
[Out] -(64*e^4*cos(1/2*d*x + 1/2*c)^2 + 64*e^4*sin(1/2*d*x + 1/2*c)^2 + 16*e^4 +
(10*I*sqrt(2)*e^4*cos(3/2*d*x + 3/2*c) + 10*I*sqrt(2)*e^4*cos(1/2*d*x + 1/2
*c) + 10*sqrt(2)*e^4*sin(3/2*d*x + 3/2*c) - 10*sqrt(2)*e^4*sin(1/2*d*x + 1/
2*c))*arctan2(sqrt(2)*sin(1/2*d*x + 1/2*c) + sin(d*x + c), sqrt(2)*cos(1/2*
d*x + 1/2*c) + cos(d*x + c) + 1) + (-10*I*sqrt(2)*e^4*cos(3/2*d*x + 3/2*c)
- 10*I*sqrt(2)*e^4*cos(1/2*d*x + 1/2*c) - 10*sqrt(2)*e^4*sin(3/2*d*x + 3/2*
c) + 10*sqrt(2)*e^4*sin(1/2*d*x + 1/2*c))*arctan2(-sqrt(2)*sin(1/2*d*x + 1/
2*c) + sin(d*x + c), -sqrt(2)*cos(1/2*d*x + 1/2*c) + cos(d*x + c) + 1) - (1
0*sqrt(2)*e^4*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c) + 1, sqrt(2)*sin(1/2*d*x
 + 1/2*c) + 1) + 10*sqrt(2)*e^4*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c) + 1, -
sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) + 10*sqrt(2)*e^4*arctan2(sqrt(2)*cos(1/2*
d*x + 1/2*c) - 1, sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) + 10*sqrt(2)*e^4*arctan
2(sqrt(2)*cos(1/2*d*x + 1/2*c) - 1, -sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) - 5*
I*sqrt(2)*e^4*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*s
qrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 5*I*sqr
t(2)*e^4*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2
)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 5*I*sqrt(2)*
e^4*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 5*I*sqrt(2)*e^4*l
og(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*
d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 64*e^4*cos(1/2*d*x + 1
/2*c) + 64*I*e^4*sin(1/2*d*x + 1/2*c))*cos(3/2*d*x + 3/2*c) - (10*sqrt(2)*e
^4*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c) + 1, sqrt(2)*sin(1/2*d*x + 1/2*c) +
 1) + 10*sqrt(2)*e^4*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c) + 1, -sqrt(2)*sin
(1/2*d*x + 1/2*c) + 1) + 10*sqrt(2)*e^4*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c
) - 1, sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) + 10*sqrt(2)*e^4*arctan2(sqrt(2)*c
os(1/2*d*x + 1/2*c) - 1, -sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) - 5*I*sqrt(2)*e
^4*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(
1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 5*I*sqrt(2)*e^4*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 5*I*sqrt(2)*e^4*log(2*c
os(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 5*I*sqrt(2)*e^4*log(2*cos(1/
2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c
) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*cos(1/2*d*x + 1/2*c) - (5*sqrt(2)*
```

```
e^4*cos(3/2*d*x + 3/2*c) + 5*sqrt(2)*e^4*cos(1/2*d*x + 1/2*c) - 5*I*sqrt(2)
*e^4*sin(3/2*d*x + 3/2*c) + 5*I*sqrt(2)*e^4*sin(1/2*d*x + 1/2*c))*log(2*sqr
t(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + 2*(sqrt(2)*cos(1/2*d*x + 1/2*c) +
1)*cos(d*x + c) + cos(d*x + c)^2 + 2*cos(1/2*d*x + 1/2*c)^2 + sin(d*x + c)^
2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 1) + (5*sqr
t(2)*e^4*cos(3/2*d*x + 3/2*c) + 5*sqrt(2)*e^4*cos(1/2*d*x + 1/2*c) - 5*I*sq
rt(2)*e^4*sin(3/2*d*x + 3/2*c) + 5*I*sqrt(2)*e^4*sin(1/2*d*x + 1/2*c))*log(
-2*sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) - 2*(sqrt(2)*cos(1/2*d*x + 1/2
*c) - 1)*cos(d*x + c) + cos(d*x + c)^2 + 2*cos(1/2*d*x + 1/2*c)^2 + sin(d*x
 + c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 1) +
(10*I*sqrt(2)*e^4*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c) + 1, sqrt(2)*sin(1/2
*d*x + 1/2*c) + 1) + 10*I*sqrt(2)*e^4*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c)
+ 1, -sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) + 10*I*sqrt(2)*e^4*arctan2(sqrt(2)*
cos(1/2*d*x + 1/2*c) - 1, sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) + 10*I*sqrt(2)*
e^4*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c) - 1, -sqrt(2)*sin(1/2*d*x + 1/2*c)
 + 1) + 5*sqrt(2)*e^4*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)
^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) -
 5*sqrt(2)*e^4*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*
sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 5*sqrt
(2)*e^4*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)
*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 5*sqrt(2)*e^4
*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/
2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 64*I*e^4*cos(1/2*d*x
 + 1/2*c) - 64*e^4*sin(1/2*d*x + 1/2*c))*sin(3/2*d*x + 3/2*c) + (-10*I*sqrt
(2)*e^4*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c) + 1, sqrt(2)*sin(1/2*d*x + 1/2
*c) + 1) - 10*I*sqrt(2)*e^4*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c) + 1, -sqrt
(2)*sin(1/2*d*x + 1/2*c) + 1) - 10*I*sqrt(2)*e^4*arctan2(sqrt(2)*cos(1/2*d*
x + 1/2*c) - 1, sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) - 10*I*sqrt(2)*e^4*arctan
2(sqrt(2)*cos(1/2*d*x + 1/2*c) - 1, -sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) - 5*
sqrt(2)*e^4*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqr
t(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 5*sqrt(2)
*e^4*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*co
s(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - 5*sqrt(2)*e^4*lo
g(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d
*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + 5*sqrt(2)*e^4*log(2*cos
(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x + 1/
2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))*sin(1/2*d*x + 1/2*c))*sqrt(a)*s
qrt(e)/((8*I*a^3*cos(3/2*d*x + 3/2*c) + 8*I*a^3*cos(1/2*d*x + 1/2*c) + 8*a^
3*sin(3/2*d*x + 3/2*c) - 8*a^3*sin(1/2*d*x + 1/2*c))*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{9/2}}{(a+a\tan(c+d\,x)\,1\mathrm{i})^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(9/2)/(a + a*tan(c + d*x)*1i)^(5/2),x)
```

```
[Out] int((e/cos(c + d*x))^(9/2)/(a + a*tan(c + d*x)*1i)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(9/2)/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.431 $\int \frac{(e\sec(c+dx))^{7/2}}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=527

$$\frac{i\sqrt{2}\,e^{7/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{a^{3/2}d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}-\frac{i\sqrt{2}\,e^{7/2}\sec(c+dx)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{a^{3/2}d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}-\frac{ie^{7/2}}{}$$

```
[Out] -1/2*I*e^(7/2)*ln(a-2^(1/2)*a^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/(e*sec
(d*x+c))^(1/2)+cos(d*x+c)*(a-I*a*tan(d*x+c)))*sec(d*x+c)/a^(3/2)/d*2^(1/2)/
(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)+1/2*I*e^(7/2)*ln(a+2^(1/2
)*a^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2)+cos(d*x+c)*
(a-I*a*tan(d*x+c)))*sec(d*x+c)/a^(3/2)/d*2^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(
a+I*a*tan(d*x+c))^(1/2)+I*e^(7/2)*arctan(1-2^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c
))^(1/2)/a^(1/2)/(e*sec(d*x+c))^(1/2))*sec(d*x+c)*2^(1/2)/a^(3/2)/d/(a-I*a*
tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)-I*e^(7/2)*arctan(1+2^(1/2)*e^(1/
2)*(a-I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*sec(d*x+c))^(1/2))*sec(d*x+c)*2^(1/2
)/a^(3/2)/d/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)+4/3*I*e^2*(e*
sec(d*x+c))^(3/2)/a/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.45, antiderivative size = 527, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {3500, 3499, 3495, 297, 1162, 617, 204, 1165, 628}

$$\frac{i\sqrt{2}\,e^{7/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{a^{3/2}d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}-\frac{i\sqrt{2}\,e^{7/2}\sec(c+dx)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{a^{3/2}d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}-\frac{ie^{7/2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(7/2)/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((4*I)/3)*e^2*(e*Sec[c + d*x])^(3/2))/(a*d*(a + I*a*Tan[c + d*x])^(3/2)) +
 (I*Sqrt[2]*e^(7/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])
/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])]*Sec[c + d*x])/(a^(3/2)*d*Sqrt[a - I*a*Tan[
c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) - (I*Sqrt[2]*e^(7/2)*ArcTan[1 + (Sqrt
[2]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])]*Sec
[c + d*x])/(a^(3/2)*d*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]
) - (I*e^(7/2)*Log[a - (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])
/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a - I*a*Tan[c + d*x])]*Sec[c + d*x])/
(Sqrt[2]*a^(3/2)*d*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) +
 (I*e^(7/2)*Log[a + (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])/Sq
rt[e*Sec[c + d*x]] + Cos[c + d*x]*(a - I*a*Tan[c + d*x])]*Sec[c + d*x])/(Sq
rt[2]*a^(3/2)*d*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3495

```
Int[Sqrt[(d_.)*sec[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[(-4*b*d^2)/f, Subst[Int[x^2/(a^2 + d^2*x^4), x],
 x, Sqrt[a + b*Tan[e + f*x]]/Sqrt[d*Sec[e + f*x]]], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3499

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(3/2)/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_
.)*(x_)]], x_Symbol] :> Dist[(d*Sec[e + f*x])/(Sqrt[a - b*Tan[e + f*x]]*Sqr
t[a + b*Tan[e + f*x]]), Int[Sqrt[d*Sec[e + f*x]]*Sqrt[a - b*Tan[e + f*x]],
x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{7/2}}{(a+ia\tan(c+dx))^{5/2}}\,dx = \frac{4ie^2(e\sec(c+dx))^{3/2}}{3ad(a+ia\tan(c+dx))^{3/2}} - \frac{e^2\int \frac{(e\sec(c+dx))^{3/2}}{\sqrt{a+ia\tan(c+dx)}}\,dx}{a^2}$$

$$= \frac{4ie^2(e\sec(c+dx))^{3/2}}{3ad(a+ia\tan(c+dx))^{3/2}} - \frac{\left(e^3\sec(c+dx)\right)\int \sqrt{e\sec(c+dx)}\,\sqrt{a-ia\tan(c+ \ldots}}{a^2\sqrt{a-ia\tan(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}$$

$$= \frac{4ie^2(e\sec(c+dx))^{3/2}}{3ad(a+ia\tan(c+dx))^{3/2}} - \frac{\left(4ie^5\sec(c+dx)\right)\text{Subst}\left(\int \frac{x^2}{a^2+e^2x^4}\,dx, x, \frac{\sqrt{a-ia\tan(\ldots}}{\sqrt{e\sec(c+\ldots}}\right.}{ad\sqrt{a-ia\tan(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}$$

$$= \frac{4ie^2(e\sec(c+dx))^{3/2}}{3ad(a+ia\tan(c+dx))^{3/2}} + \frac{\left(2ie^4\sec(c+dx)\right)\text{Subst}\left(\int \frac{a-ex^2}{a^2+e^2x^4}\,dx, x, \frac{\sqrt{a-ia\tan(\ldots}}{\sqrt{e\sec(c+\ldots}}\right.}{ad\sqrt{a-ia\tan(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}$$

$$= \frac{4ie^2(e\sec(c+dx))^{3/2}}{3ad(a+ia\tan(c+dx))^{3/2}} - \frac{\left(ie^3\sec(c+dx)\right)\text{Subst}\left(\int \frac{1}{\frac{a}{e}-\frac{\sqrt{2}\sqrt{a}x}{\sqrt{e}}+x^2}\,dx, x, \frac{\sqrt{a-ia\ldots}}{\sqrt{e\,se\ldots}}\right.}{ad\sqrt{a-ia\tan(c+dx)}\,\sqrt{a+ia\tan(c+dx)\ldots}}$$

$$= \frac{4ie^2(e\sec(c+dx))^{3/2}}{3ad(a+ia\tan(c+dx))^{3/2}} - \frac{ie^{7/2}\log\left(a-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}+\cos(c+dx)(\ldots\right.}{\sqrt{2}\,a^{3/2}d\sqrt{a-ia\tan(c+dx)}\,\sqrt{a+\ldots}}$$

$$= \frac{4ie^2(e\sec(c+dx))^{3/2}}{3ad(a+ia\tan(c+dx))^{3/2}} + \frac{i\sqrt{2}\,e^{7/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)\sec(c+dx\ldots}{a^{3/2}d\sqrt{a-ia\tan(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}$$

Mathematica [B] time = 27.26, size = 11295, normalized size = 21.43

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Sec[c + d*x])^(7/2)/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] Result too large to show
```

fricas [A] time = 0.63, size = 543, normalized size = 1.03

$$-\frac{\left(3a^3d\sqrt{\frac{4ie^7}{a^5d^2}}e^{(2idx+2ic)}\log\left(\frac{ia^3d\sqrt{\frac{4ie^7}{a^5d^2}}+2\left(e^3e^{(2idx+2ic)}+e^3\right)\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}e^{\left(\frac{1}{2}idx+\frac{1}{2}ic\right)}}{e^3}\right)-3a^3d\sqrt{\frac{4ie^7}{a^5d^2}}e^{(2idx+\ldots}\right.}{\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="frica
s")
```

```
[Out] -1/6*(3*a^3*d*sqrt(4*I*e^7/(a^5*d^2))*e^(2*I*d*x + 2*I*c)*log((I*a^3*d*sqrt
(4*I*e^7/(a^5*d^2)) + 2*(e^3*e^(2*I*d*x + 2*I*c) + e^3)*sqrt(a/(e^(2*I*d*x
+ 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))/e
^3) - 3*a^3*d*sqrt(4*I*e^7/(a^5*d^2))*e^(2*I*d*x + 2*I*c)*log((-I*a^3*d*sqr
t(4*I*e^7/(a^5*d^2)) + 2*(e^3*e^(2*I*d*x + 2*I*c) + e^3)*sqrt(a/(e^(2*I*d*x
 + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))/
e^3) + 3*a^3*d*sqrt(-4*I*e^7/(a^5*d^2))*e^(2*I*d*x + 2*I*c)*log((I*a^3*d*sq
rt(-4*I*e^7/(a^5*d^2)) + 2*(e^3*e^(2*I*d*x + 2*I*c) + e^3)*sqrt(a/(e^(2*I*d
*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)
)/e^3) - 3*a^3*d*sqrt(-4*I*e^7/(a^5*d^2))*e^(2*I*d*x + 2*I*c)*log((-I*a^3*d
*sqrt(-4*I*e^7/(a^5*d^2)) + 2*(e^3*e^(2*I*d*x + 2*I*c) + e^3)*sqrt(a/(e^(2*
```

```
I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I
*c))/e^3) - 2*(4*I*e^3*e^(2*I*d*x + 2*I*c) + 4*I*e^3)*sqrt(a/(e^(2*I*d*x +
2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c))*e^(
-2*I*d*x - 2*I*c)/(a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e \sec (dx + c))^{\frac{7}{2}}}{(i a \tan (dx + c) + a)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac"
)
```

```
[Out] integrate((e*sec(d*x + c))^(7/2)/(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [B] time = 1.19, size = 1324, normalized size = 2.51

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 1/6/d*(-1+cos(d*x+c))^3*(-3*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c
)+1+sin(d*x+c)))+8*(1/(1+cos(d*x+c)))^(1/2)-3*arctanh(1/2*(1/(1+cos(d*x+c))
)^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))-12*cos(d*x+c)^2*sin(d*x+c)*arctanh(1/2*(
1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))+12*cos(d*x+c)^2*sin(d*x+
c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+6*cos(d*
x+c)*sin(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+
c)))-6*cos(d*x+c)*sin(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+
c)+1+sin(d*x+c)))-12*cos(d*x+c)^3*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos
(d*x+c)+1+sin(d*x+c)))-12*cos(d*x+c)^3*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)
*(cos(d*x+c)+1-sin(d*x+c)))-8*cos(d*x+c)^2*(1/(1+cos(d*x+c)))^(1/2)-8*I*(1/
(1+cos(d*x+c)))^(1/2)*cos(d*x+c)*sin(d*x+c)-12*I*cos(d*x+c)^2*sin(d*x+c)*ar
ctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))-12*I*cos(d*x+
c)^2*sin(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+
c)))+6*I*cos(d*x+c)*sin(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*
x+c)+1-sin(d*x+c)))+6*I*cos(d*x+c)*sin(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c))
)^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+6*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos(d*x
+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+6*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos
(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))+9*cos(d*x+c)*arctanh(1/2*(1/(1+c
os(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))+9*cos(d*x+c)*arctanh(1/2*(1/(1
+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+12*I*cos(d*x+c)^3*arctanh(1/
2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))-12*I*cos(d*x+c)^3*arc
tanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))-6*I*cos(d*x+c)
^2*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c)))+6*I*cos(
d*x+c)^2*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))-9*
I*cos(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+c))
)+9*I*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))*cos(d
*x+c)+3*I*sin(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin
(d*x+c)))+3*I*sin(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1
+sin(d*x+c)))+3*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-sin(d*x+
c)))*sin(d*x+c)-3*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*
x+c)))*sin(d*x+c)+3*I*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1-si
n(d*x+c)))-3*I*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c
))))*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*cos(d*x+c)^4*(e/cos(d*x
+c))^(7/2)/(4*I*sin(d*x+c)*cos(d*x+c)^2+4*cos(d*x+c)^3-I*sin(d*x+c)-3*cos(d
*x+c))/(1/(1+cos(d*x+c)))^(7/2)/sin(d*x+c)^7/a^3
```

maxima [B] time = 1.03, size = 1466, normalized size = 2.78

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxim
a")
```

```
[Out] 1/12*(6*I*sqrt(2)*e^3*arctan2(sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c),
 cos(3/2*d*x + 3/2*c))) + 1, sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c),
cos(3/2*d*x + 3/2*c))) + 1) + 6*I*sqrt(2)*e^3*arctan2(sqrt(2)*cos(1/3*arcta
n2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1, -sqrt(2)*sin(1/3*arcta
n2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) + 6*I*sqrt(2)*e^3*arct
an2(sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) -
1, sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1
) + 6*I*sqrt(2)*e^3*arctan2(sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), c
os(3/2*d*x + 3/2*c))) - 1, -sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), c
os(3/2*d*x + 3/2*c))) + 1) - 6*sqrt(2)*e^3*arctan2(sqrt(2)*sin(1/3*arctan2(
sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + sin(2/3*arctan2(sin(3/2*d*x
+ 3/2*c), cos(3/2*d*x + 3/2*c))), sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2
*c), cos(3/2*d*x + 3/2*c))) + cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2
*d*x + 3/2*c))) + 1) + 6*sqrt(2)*e^3*arctan2(-sqrt(2)*sin(1/3*arctan2(sin(3
/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + sin(2/3*arctan2(sin(3/2*d*x + 3/2
*c), cos(3/2*d*x + 3/2*c))), -sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c),
 cos(3/2*d*x + 3/2*c))) + cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x
 + 3/2*c))) + 1) + 3*I*sqrt(2)*e^3*log(2*sqrt(2)*sin(2/3*arctan2(sin(3/2*d*
x + 3/2*c), cos(3/2*d*x + 3/2*c)))*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), co
s(3/2*d*x + 3/2*c))) + 2*(sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos
(3/2*d*x + 3/2*c))) + 1)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x
+ 3/2*c))) + cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2
 + 2*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + sin(2
/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arcta
n2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sqrt(2)*cos(1/3*arcta
n2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) - 3*I*sqrt(2)*e^3*log(
-2*sqrt(2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))*sin
(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 2*(sqrt(2)*cos(
1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 1)*cos(2/3*arcta
n2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + cos(2/3*arctan2(sin(3/2*d
*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*cos(1/3*arctan2(sin(3/2*d*x + 3/2
*c), cos(3/2*d*x + 3/2*c)))^2 + sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3
/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x +
 3/2*c)))^2 - 2*sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x +
 3/2*c))) + 1) - 3*sqrt(2)*e^3*log(2*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c),
cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*
d*x + 3/2*c)))^2 + 2*sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*
d*x + 3/2*c))) + 2*sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*
x + 3/2*c))) + 2) + 3*sqrt(2)*e^3*log(2*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c
), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3
/2*d*x + 3/2*c)))^2 + 2*sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3
/2*d*x + 3/2*c))) - 2*sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2
*d*x + 3/2*c))) + 2) - 3*sqrt(2)*e^3*log(2*cos(1/3*arctan2(sin(3/2*d*x + 3/
2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), co
s(3/2*d*x + 3/2*c)))^2 - 2*sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), co
s(3/2*d*x + 3/2*c))) + 2*sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(
3/2*d*x + 3/2*c))) + 2) + 3*sqrt(2)*e^3*log(2*cos(1/3*arctan2(sin(3/2*d*x +
 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c),
 cos(3/2*d*x + 3/2*c)))^2 - 2*sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c),
 cos(3/2*d*x + 3/2*c))) - 2*sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), c
os(3/2*d*x + 3/2*c))) + 2) + 16*I*e^3*cos(3/2*d*x + 3/2*c) + 16*e^3*sin(3/2
*d*x + 3/2*c))*sqrt(e)/(a^(5/2)*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{7/2}}{\left(a+a\tan\left(c+d\,x\right)\,1\mathrm{i}\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(7/2)/(a + a*tan(c + d*x)*1i)^(5/2),x)
[Out] int((e/cos(c + d*x))^(7/2)/(a + a*tan(c + d*x)*1i)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(7/2)/(a+I*a*tan(d*x+c))**(5/2),x)
[Out] Timed out
```

3.432 $\int \frac{(e\sec(c+dx))^{5/2}}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=38

$$\frac{2i(e\sec(c+dx))^{5/2}}{5d(a+ia\tan(c+dx))^{5/2}}$$

```
[Out] 2/5*I*(e*sec(d*x+c))^(5/2)/d/(a+I*a*tan(d*x+c))^(5/2)
```

Rubi [A] time = 0.08, antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.033$, Rules used = {3488}

$$\frac{2i(e\sec(c+dx))^{5/2}}{5d(a+ia\tan(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(5/2)/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((2*I)/5)*(e*Sec[c + d*x])^(5/2))/(d*(a + I*a*Tan[c + d*x])^(5/2))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{5/2}}{(a+ia\tan(c+dx))^{5/2}}\,dx = \frac{2i(e\sec(c+dx))^{5/2}}{5d(a+ia\tan(c+dx))^{5/2}}$$

Mathematica [A] time = 0.25, size = 38, normalized size = 1.00

$$\frac{2i(e\sec(c+dx))^{5/2}}{5d(a+ia\tan(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(5/2)/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((2*I)/5)*(e*Sec[c + d*x])^(5/2))/(d*(a + I*a*Tan[c + d*x])^(5/2))
```

fricas [B] time = 0.72, size = 71, normalized size = 1.87

$$\frac{2\left(ie^{2}e^{(2i\,dx+2i\,c)}+ie^{2}\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{5}{2}i\,dx-\frac{5}{2}i\,c\right)}}{5\,a^{3}d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="frica
s")
```

```
[Out] 2/5*(I*e^2*e^(2*I*d*x + 2*I*c) + I*e^2)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*s
qrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(-5/2*I*d*x - 5/2*I*c)/(a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{5}{2}}}{(ia\tan(dx+c)+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac"
)
```

```
[Out] integrate((e*sec(d*x + c))^(5/2)/(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [B] time = 1.12, size = 103, normalized size = 2.71

$$\frac{2i\left(\frac{e}{\cos(dx+c)}\right)^{\frac{5}{2}}\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\,\left(\cos^3(dx+c)\right)\left(-4i\left(\cos^2(dx+c)\right)\sin(dx+c)+4\left(\cos^3(dx+c)\right)+i\sin(\right.}{5d\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 2/5*I/d*(e/cos(d*x+c))^(5/2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)
*cos(d*x+c)^3*(-4*I*cos(d*x+c)^2*sin(d*x+c)+4*cos(d*x+c)^3+I*sin(d*x+c)-3*c
os(d*x+c))/a^3
```

maxima [B] time = 0.91, size = 76, normalized size = 2.00

$$\frac{2i\,e^{\frac{5}{2}}\left(-\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-1\right)^{\frac{5}{2}}}{5\,a^{\frac{5}{2}}d\left(-\frac{2i\,\sin(dx+c)}{\cos(dx+c)+1}+\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-1\right)^{\frac{5}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxim
a")
```

```
[Out] 2/5*I*e^(5/2)*(-sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 1)^(5/2)/(a^(5/2)*d*(
-2*I*sin(d*x + c)/(cos(d*x + c) + 1) + sin(d*x + c)^2/(cos(d*x + c) + 1)^2
- 1)^(5/2))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{5/2}}{(a+a\tan(c+d\,x)\,1\mathrm{i})^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(5/2)/(a + a*tan(c + d*x)*1i)^(5/2),x)
```

```
[Out] int((e/cos(c + d*x))^(5/2)/(a + a*tan(c + d*x)*1i)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(5/2)/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.433 $\int \frac{(e\sec(c+dx))^{3/2}}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=80

$$\frac{4i(e\sec(c+dx))^{3/2}}{21ad(a+ia\tan(c+dx))^{3/2}}+\frac{2i(e\sec(c+dx))^{3/2}}{7d(a+ia\tan(c+dx))^{5/2}}$$

```
[Out] 2/7*I*(e*sec(d*x+c))^(3/2)/d/(a+I*a*tan(d*x+c))^(5/2)+4/21*I*(e*sec(d*x+c))
^(3/2)/a/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.17, antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {3502, 3488}

$$\frac{4i(e\sec(c+dx))^{3/2}}{21ad(a+ia\tan(c+dx))^{3/2}}+\frac{2i(e\sec(c+dx))^{3/2}}{7d(a+ia\tan(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(3/2)/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((2*I)/7)*(e*Sec[c + d*x])^(3/2))/(d*(a + I*a*Tan[c + d*x])^(5/2)) + (((4*
I)/21)*(e*Sec[c + d*x])^(3/2))/(a*d*(a + I*a*Tan[c + d*x])^(3/2))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\begin{aligned}\int \frac{(e\sec(c+dx))^{3/2}}{(a+ia\tan(c+dx))^{5/2}}\,dx &= \frac{2i(e\sec(c+dx))^{3/2}}{7d(a+ia\tan(c+dx))^{5/2}}+\frac{2\int \frac{(e\sec(c+dx))^{3/2}}{(a+ia\tan(c+dx))^{3/2}}\,dx}{7a}\\ &= \frac{2i(e\sec(c+dx))^{3/2}}{7d(a+ia\tan(c+dx))^{5/2}}+\frac{4i(e\sec(c+dx))^{3/2}}{21ad(a+ia\tan(c+dx))^{3/2}}\end{aligned}$$

Mathematica [A] time = 0.23, size = 63, normalized size = 0.79

$$\frac{2(2\tan(c+dx)-5i)(e\sec(c+dx))^{3/2}}{21a^2d(\tan(c+dx)-i)^2\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(3/2)/(a + I*a*Tan[c + d*x])^(5/2),x]
```

[Out] (2*(e*Sec[c + d*x])^(3/2)*(-5*I + 2*Tan[c + d*x]))/(21*a^2*d*(-I + Tan[c + d*x])^2*Sqrt[a + I*a*Tan[c + d*x]])

fricas [A] time = 0.65, size = 79, normalized size = 0.99

$$\frac{\left(7 i e e^{(4 i dx+4 i c)}+10 i e e^{(2 i dx+2 i c)}+3 i e\right)\sqrt{\frac{a}{e^{(2 i dx+2 i c)}+1}}\sqrt{\frac{e}{e^{(2 i dx+2 i c)}+1}}e^{\left(-\frac{7}{2} i dx-\frac{7}{2} i c\right)}}{21 a^3 d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")

[Out] 1/21*(7*I*e*e^(4*I*d*x + 4*I*c) + 10*I*e*e^(2*I*d*x + 2*I*c) + 3*I*e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(-7/2*I*d*x - 7/2*I*c)/(a^3*d)

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e \sec (dx+c))^{\frac{3}{2}}}{(i a \tan (dx+c)+a)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")

[Out] integrate((e*sec(d*x + c))^(3/2)/(I*a*tan(d*x + c) + a)^(5/2), x)

maple [A] time = 1.11, size = 112, normalized size = 1.40

$$-\frac{2 i \left(\frac{e}{\cos (dx+c)}\right)^{\frac{3}{2}} \sqrt{\frac{a (i \sin (dx+c)+\cos (dx+c))}{\cos (dx+c)}}\, \left(\cos^2 (dx+c)\right) \left(12 i \sin (dx+c) \left(\cos^3 (dx+c)\right)-12 \left(\cos^4 (dx+c)\right)+i \cos\right.}{21 d a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(5/2),x)

[Out] -2/21*I/d*(e/cos(d*x+c))^(3/2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*cos(d*x+c)^2*(12*I*cos(d*x+c)^3*sin(d*x+c)-12*cos(d*x+c)^4+I*sin(d*x+c)*cos(d*x+c)+5*cos(d*x+c)^2+2)/a^3

maxima [A] time = 0.61, size = 86, normalized size = 1.08

$$\frac{\left(3 i e \cos \left(\frac{7}{2} dx+\frac{7}{2} c\right)+7 i e \cos \left(\frac{3}{7} \arctan \left(\sin \left(\frac{7}{2} dx+\frac{7}{2} c\right), \cos \left(\frac{7}{2} dx+\frac{7}{2} c\right)\right)\right)+3 e \sin \left(\frac{7}{2} dx+\frac{7}{2} c\right)+7 e \sin \left(\frac{3}{7}\right.\right.}{21 a^{\frac{5}{2}} d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")

[Out] 1/21*(3*I*e*cos(7/2*d*x + 7/2*c) + 7*I*e*cos(3/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))) + 3*e*sin(7/2*d*x + 7/2*c) + 7*e*sin(3/7*arctan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))))*sqrt(e)/(a^(5/2)*d)

mupad [B] time = 4.23, size = 102, normalized size = 1.28

$$\frac{e \sqrt{\frac{e}{\cos (c+d\,x)}}\, \left(7 \sin (c+d\,x)+3 \sin (3\,c+3\,d\,x)+\cos (c+d\,x)\, 7\mathrm{i}+\cos (3\,c+3\,d\,x)\, 3\mathrm{i}\right)}{21\,a^2\,d\,\sqrt{\frac{a\,(\cos (2\,c+2\,d\,x)+1+\sin (2\,c+2\,d\,x)\,1\mathrm{i})}{\cos (2\,c+2\,d\,x)+1}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(3/2)/(a + a*tan(c + d*x)*1i)^(5/2),x)
```

```
[Out] (e*(e/cos(c + d*x))^(1/2)*(cos(c + d*x)*7i + 7*sin(c + d*x) + cos(3*c + 3*d
*x)*3i + 3*sin(3*c + 3*d*x)))/(21*a^2*d*((a*(cos(2*c + 2*d*x) + sin(2*c + 2
*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e \sec (c + dx))^{\frac{3}{2}}}{(ia (\tan (c + dx) - i))^{\frac{5}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(3/2)/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Integral((e*sec(c + d*x))**(3/2)/(I*a*(tan(c + d*x) - I))**(5/2), x)
```

3.434 $\int \frac{\sqrt{e\sec(c+dx)}}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=121

$$\frac{16i\sqrt{e\sec(c+dx)}}{45a^2d\sqrt{a+ia\tan(c+dx)}}+\frac{8i\sqrt{e\sec(c+dx)}}{45ad(a+ia\tan(c+dx))^{3/2}}+\frac{2i\sqrt{e\sec(c+dx)}}{9d(a+ia\tan(c+dx))^{5/2}}$$

```
[Out] 16/45*I*(e*sec(d*x+c))^(1/2)/a^2/d/(a+I*a*tan(d*x+c))^(1/2)+2/9*I*(e*sec(d*
x+c))^(1/2)/d/(a+I*a*tan(d*x+c))^(5/2)+8/45*I*(e*sec(d*x+c))^(1/2)/a/d/(a+I
*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.22, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {3502, 3488}

$$\frac{16i\sqrt{e\sec(c+dx)}}{45a^2d\sqrt{a+ia\tan(c+dx)}}+\frac{8i\sqrt{e\sec(c+dx)}}{45ad(a+ia\tan(c+dx))^{3/2}}+\frac{2i\sqrt{e\sec(c+dx)}}{9d(a+ia\tan(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Sec[c + d*x]]/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (((2*I)/9)*Sqrt[e*Sec[c + d*x]])/(d*(a + I*a*Tan[c + d*x])^(5/2)) + (((8*I)
/45)*Sqrt[e*Sec[c + d*x]])/(a*d*(a + I*a*Tan[c + d*x])^(3/2)) + (((16*I)/45
)*Sqrt[e*Sec[c + d*x]])/(a^2*d*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{e\sec(c+dx)}}{(a+ia\tan(c+dx))^{5/2}}\,dx &= \frac{2i\sqrt{e\sec(c+dx)}}{9d(a+ia\tan(c+dx))^{5/2}}+\frac{4\int \frac{\sqrt{e\sec(c+dx)}}{(a+ia\tan(c+dx))^{3/2}}\,dx}{9a}\\
&= \frac{2i\sqrt{e\sec(c+dx)}}{9d(a+ia\tan(c+dx))^{5/2}}+\frac{8i\sqrt{e\sec(c+dx)}}{45ad(a+ia\tan(c+dx))^{3/2}}+\frac{8\int \frac{\sqrt{e\sec(c+dx)}}{\sqrt{a+ia\tan(c+dx)}}\,dx}{45a^2}\\
&= \frac{2i\sqrt{e\sec(c+dx)}}{9d(a+ia\tan(c+dx))^{5/2}}+\frac{8i\sqrt{e\sec(c+dx)}}{45ad(a+ia\tan(c+dx))^{3/2}}+\frac{16i\sqrt{e\sec(c+dx)}}{45a^2d\sqrt{a+ia\tan(c+d}}
\end{aligned}$$

Mathematica [A] time = 0.33, size = 85, normalized size = 0.70

$$-\frac{i\sec^2(c+dx)\sqrt{e\sec(c+dx)}\,(20i\sin(2(c+dx))+25\cos(2(c+dx))+9)}{45a^2d(\tan(c+dx)-i)^2\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Sec[c + d*x]]/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((-1/45*I)*Sec[c + d*x]^2*Sqrt[e*Sec[c + d*x]]*(9 + 25*Cos[2*(c + d*x)] + (
20*I)*Sin[2*(c + d*x)]))/(a^2*d*(-I + Tan[c + d*x])^2*Sqrt[a + I*a*Tan[c +
d*x]])
```

fricas [A] time = 1.51, size = 86, normalized size = 0.71

$$\frac{\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(45i\,e^{(6i\,dx+6i\,c)}+63i\,e^{(4i\,dx+4i\,c)}+23i\,e^{(2i\,dx+2i\,c)}+5i\right)e^{\left(-\frac{9}{2}i\,dx-\frac{9}{2}i\,c\right)}}{90\,a^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="frica
s")
```

```
[Out] 1/90*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(4
5*I*e^(6*I*d*x + 6*I*c) + 63*I*e^(4*I*d*x + 4*I*c) + 23*I*e^(2*I*d*x + 2*I*
c) + 5*I)*e^(-9/2*I*d*x - 9/2*I*c)/(a^3*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\sqrt{e\sec\left(dx+c\right)}}{\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac"
)
```

```
[Out] integrate(sqrt(e*sec(d*x + c))/(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [A] time = 1.17, size = 128, normalized size = 1.06

$$-\frac{2i\sqrt{\frac{e}{\cos(dx+c)}}\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\cos\left(dx+c\right)\left(20i\left(\cos^4\left(dx+c\right)\right)\sin\left(dx+c\right)-20\left(\cos^5\left(dx+c\right)\right)+3i\left(c\right.\right.}{45d\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] -2/45*I/d*(e/cos(d*x+c))^(1/2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/
2)*cos(d*x+c)*(20*I*cos(d*x+c)^4*sin(d*x+c)-20*cos(d*x+c)^5+3*I*cos(d*x+c)^
2*sin(d*x+c)+7*cos(d*x+c)^3+8*I*sin(d*x+c)-4*cos(d*x+c))/a^3
```

maxima [A] time = 1.12, size = 130, normalized size = 1.07

$$\frac{\sqrt{e}\left(5i\cos\left(\frac{9}{2}\,dx+\frac{9}{2}\,c\right)+18i\cos\left(\frac{5}{9}\arctan\left(\sin\left(\frac{9}{2}\,dx+\frac{9}{2}\,c\right),\cos\left(\frac{9}{2}\,dx+\frac{9}{2}\,c\right)\right)\right)+45i\cos\left(\frac{1}{9}\arctan\left(\sin\left(\frac{9}{2}\right.\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxim
a")
```

```
[Out] 1/90*sqrt(e)*(5*I*cos(9/2*d*x + 9/2*c) + 18*I*cos(5/9*arctan2(sin(9/2*d*x +
 9/2*c), cos(9/2*d*x + 9/2*c))) + 45*I*cos(1/9*arctan2(sin(9/2*d*x + 9/2*c)
, cos(9/2*d*x + 9/2*c))) + 5*sin(9/2*d*x + 9/2*c) + 18*sin(5/9*arctan2(sin(
```

```
9/2*d*x + 9/2*c), cos(9/2*d*x + 9/2*c))) + 45*sin(1/9*arctan2(sin(9/2*d*x +
 9/2*c), cos(9/2*d*x + 9/2*c))))/(a^(5/2)*d)
```

mupad [B] time = 4.22, size = 109, normalized size = 0.90

$$\frac{\sqrt{\frac{e}{\cos(c+d\,x)}}\,\left(\cos\left(2\,c+2\,d\,x\right)\,18\mathrm{i}+\cos\left(4\,c+4\,d\,x\right)\,5\mathrm{i}+18\,\sin\left(2\,c+2\,d\,x\right)+5\,\sin\left(4\,c+4\,d\,x\right)+45\mathrm{i}\right)}{90\,a^2\,d\,\sqrt{\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(1/2)/(a + a*tan(c + d*x)*1i)^(5/2),x)
```

```
[Out] ((e/cos(c + d*x))^(1/2)*(cos(2*c + 2*d*x)*18i + cos(4*c + 4*d*x)*5i + 18*si
n(2*c + 2*d*x) + 5*sin(4*c + 4*d*x) + 45i))/(90*a^2*d*((a*(cos(2*c + 2*d*x)
 + sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\sec\left(c+dx\right)}}{\left(ia\left(\tan\left(c+dx\right)-i\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(1/2)/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Integral(sqrt(e*sec(c + d*x))/(I*a*(tan(c + d*x) - I))**(5/2), x)
```

3.435 $\int \frac{1}{\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=162

$$-\frac{32i\sqrt{a+ia\tan(c+dx)}}{77a^3d\sqrt{e\sec(c+dx)}}+\frac{16i}{77a^2d\sqrt{a+ia\tan(c+dx)}\,\sqrt{e\sec(c+dx)}}+\frac{12i}{77ad(a+ia\tan(c+dx))^{3/2}\sqrt{e\sec(c+d}}$$

```
[Out] 16/77*I/a^2/d/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)-32/77*I*(a+I*a*
tan(d*x+c))^(1/2)/a^3/d/(e*sec(d*x+c))^(1/2)+2/11*I/d/(e*sec(d*x+c))^(1/2)/
(a+I*a*tan(d*x+c))^(5/2)+12/77*I/a/d/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c)
)^(3/2)
```

Rubi [A] time = 0.30, antiderivative size = 162, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {3502, 3488}

$$-\frac{32i\sqrt{a+ia\tan(c+dx)}}{77a^3d\sqrt{e\sec(c+dx)}}+\frac{16i}{77a^2d\sqrt{a+ia\tan(c+dx)}\,\sqrt{e\sec(c+dx)}}+\frac{12i}{77ad(a+ia\tan(c+dx))^{3/2}\sqrt{e\sec(c+d}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^(5/2)),x]
```

```
[Out] ((2*I)/11)/(d*Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^(5/2)) + ((12*I)/
77)/(a*d*Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^(3/2)) + ((16*I)/77)/(
a^2*d*Sqrt[e*Sec[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) - (((32*I)/77)*Sqrt[
a + I*a*Tan[c + d*x]])/(a^3*d*Sqrt[e*Sec[c + d*x]])
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{1}{\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^{5/2}}\,dx=\frac{2i}{11d\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^{5/2}}+\frac{6\int \frac{1}{\sqrt{e\sec(c+dx)}\,(a+ia\,\mathrm{ta}}}{11a}$$

$$=\frac{2i}{11d\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^{5/2}}+\frac{1}{77ad\sqrt{e\sec(c+dx)}}$$

$$=\frac{2i}{11d\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^{5/2}}+\frac{1}{77ad\sqrt{e\sec(c+dx)}}$$

$$=\frac{2i}{11d\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^{5/2}}+\frac{1}{77ad\sqrt{e\sec(c+dx)}}$$

Mathematica [A] time = 0.42, size = 102, normalized size = 0.63

$$\frac{i\sec^3(c+dx)(-22i\sin(c+dx)+42i\sin(3(c+dx))-55\cos(c+dx)+35\cos(3(c+dx)))}{154a^2d(\tan(c+dx)-i)^2\sqrt{a+ia\tan(c+dx)}\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^(5/2)),x]
```

```
[Out] ((I/154)*Sec[c + d*x]^3*(-55*Cos[c + d*x] + 35*Cos[3*(c + d*x)] - (22*I)*Si
n[c + d*x] + (42*I)*Sin[3*(c + d*x)]))/(a^2*d*Sqrt[e*Sec[c + d*x]]*(-I + Ta
n[c + d*x])^2*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 2.47, size = 89, normalized size = 0.55

$$\frac{\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(-77i\,e^{(8i\,dx+8i\,c)}+110i\,e^{(4i\,dx+4i\,c)}+40i\,e^{(2i\,dx+2i\,c)}+7i\right)e^{\left(-\frac{11}{2}i\,dx-\frac{11}{2}i\,c\right)}}{308\,a^3de}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fri
cas")
```

```
[Out] 1/308*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(
-77*I*e^(8*I*d*x + 8*I*c) + 110*I*e^(4*I*d*x + 4*I*c) + 40*I*e^(2*I*d*x + 2
*I*c) + 7*I)*e^(-11/2*I*d*x - 11/2*I*c)/(a^3*d*e)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{e\sec\left(dx+c\right)}\left(i\,a\tan\left(dx+c\right)+a\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="gia
c")
```

```
[Out] integrate(1/(sqrt(e*sec(d*x + c))*(I*a*tan(d*x + c) + a)^(5/2)), x)
```

maple [A] time = 1.19, size = 140, normalized size = 0.86

$$\frac{2\cos\left(dx+c\right)\sqrt{\frac{e}{\cos(dx+c)}}\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(28i\left(\cos^6\left(dx+c\right)\right)+28\left(\cos^5\left(dx+c\right)\right)\sin\left(dx+c\right)-9i\left(\cos^4\left(\right.\right.\right.}{77de\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 2/77/d*cos(d*x+c)*(e/cos(d*x+c))^(1/2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x
+c))^(1/2)*(28*I*cos(d*x+c)^6+28*cos(d*x+c)^5*sin(d*x+c)-9*I*cos(d*x+c)^4+5
*cos(d*x+c)^3*sin(d*x+c)+2*I*cos(d*x+c)^2+8*cos(d*x+c)*sin(d*x+c)-16*I)/e/a
^3
```

maxima [A] time = 1.05, size = 178, normalized size = 1.10

$$7i\cos\left(\frac{11}{2}\,dx+\frac{11}{2}\,c\right)+33i\cos\left(\frac{7}{11}\arctan\left(\sin\left(\frac{11}{2}\,dx+\frac{11}{2}\,c\right),\cos\left(\frac{11}{2}\,dx+\frac{11}{2}\,c\right)\right)\right)+77i\cos\left(\frac{3}{11}\arctan\left(\sin\left(\frac{11}{2}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="max
ima")
```

```
[Out] 1/308*(7*I*cos(11/2*d*x + 11/2*c) + 33*I*cos(7/11*arctan2(sin(11/2*d*x + 11
/2*c), cos(11/2*d*x + 11/2*c))) + 77*I*cos(3/11*arctan2(sin(11/2*d*x + 11/2
*c), cos(11/2*d*x + 11/2*c))) - 77*I*cos(1/11*arctan2(sin(11/2*d*x + 11/2*c
), cos(11/2*d*x + 11/2*c))) + 7*sin(11/2*d*x + 11/2*c) + 33*sin(7/11*arctan
2(sin(11/2*d*x + 11/2*c), cos(11/2*d*x + 11/2*c))) + 77*sin(3/11*arctan2(si
n(11/2*d*x + 11/2*c), cos(11/2*d*x + 11/2*c))) + 77*sin(1/11*arctan2(sin(11
/2*d*x + 11/2*c), cos(11/2*d*x + 11/2*c))))/(a^(5/2)*d*sqrt(e))
```

mupad [B] time = 4.51, size = 118, normalized size = 0.73

$$\frac{\sqrt{\frac{e}{\cos(c+d\,x)}}\,\left(154\,\sin\left(c+d\,x\right)+33\,\sin\left(3\,c+3\,d\,x\right)+7\,\sin\left(5\,c+5\,d\,x\right)+\cos\left(3\,c+3\,d\,x\right)\,33{}\mathrm{i}+\cos\left(5\,c+5\,d\right.}{308\,a^2\,d\,e\,\sqrt{\frac{a\,\left(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1{}\mathrm{i}\right)}{\cos(2\,c+2\,d\,x)+1}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^(5/2)),x)
```

```
[Out] ((e/cos(c + d*x))^(1/2)*(154*sin(c + d*x) + cos(3*c + 3*d*x)*33i + cos(5*c
+ 5*d*x)*7i + 33*sin(3*c + 3*d*x) + 7*sin(5*c + 5*d*x)))/(308*a^2*d*e*((a*(
cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1))^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{e\sec\left(c+dx\right)}\,\left(ia\left(\tan\left(c+dx\right)-i\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))**(1/2)/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Integral(1/(sqrt(e*sec(c + d*x))*(I*a*(tan(c + d*x) - I))**(5/2)), x)
```

3.436 $\int \frac{1}{(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=206

$$-\frac{128i\sqrt{a+ia\tan(c+dx)}}{585a^3d(e\sec(c+dx))^{3/2}}+\frac{256i\sqrt{e\sec(c+dx)}}{585a^2de^2\sqrt{a+ia\tan(c+dx)}}+\frac{32i}{195a^2d\sqrt{a+ia\tan(c+dx)}\,(e\sec(c+dx))^{3/2}}+\frac{}{117ad(}$$

```
[Out] 32/195*I/a^2/d/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2)+256/585*I*(e*s
ec(d*x+c))^(1/2)/a^2/d/e^2/(a+I*a*tan(d*x+c))^(1/2)-128/585*I*(a+I*a*tan(d*
x+c))^(1/2)/a^3/d/(e*sec(d*x+c))^(3/2)+2/13*I/d/(e*sec(d*x+c))^(3/2)/(a+I*a
*tan(d*x+c))^(5/2)+16/117*I/a/d/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(3/
2)
```

Rubi [A] time = 0.40, antiderivative size = 206, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.100$, Rules used = {3502, 3497, 3488}

$$\frac{256i\sqrt{e\sec(c+dx)}}{585a^2de^2\sqrt{a+ia\tan(c+dx)}}-\frac{128i\sqrt{a+ia\tan(c+dx)}}{585a^3d(e\sec(c+dx))^{3/2}}+\frac{32i}{195a^2d\sqrt{a+ia\tan(c+dx)}\,(e\sec(c+dx))^{3/2}}+\frac{}{117ad(a}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^(5/2)),x]
```

```
[Out] ((2*I)/13)/(d*(e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^(5/2)) + ((16*I
)/117)/(a*d*(e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^(3/2)) + ((32*I)/
195)/(a^2*d*(e*Sec[c + d*x])^(3/2)*Sqrt[a + I*a*Tan[c + d*x]]) + (((256*I)/
585)*Sqrt[e*Sec[c + d*x]])/(a^2*d*e^2*Sqrt[a + I*a*Tan[c + d*x]]) - (((128*
I)/585)*Sqrt[a + I*a*Tan[c + d*x]])/(a^3*d*(e*Sec[c + d*x])^(3/2))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rubi steps

$$\int \frac{1}{(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^{5/2}}\,dx = \frac{2i}{13d(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^{5/2}} + \frac{8\int \frac{1}{(e\sec(c+dx))^{3/2}(\ldots}}{1\ldots}$$

$$= \frac{2i}{13d(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^{5/2}} + \frac{\ldots}{117ad(e\sec(c+\ldots}$$

$$= \frac{2i}{13d(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^{5/2}} + \frac{\ldots}{117ad(e\sec(c+\ldots}$$

$$= \frac{2i}{13d(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^{5/2}} + \frac{\ldots}{117ad(e\sec(c+\ldots}$$

$$= \frac{2i}{13d(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^{5/2}} + \frac{\ldots}{117ad(e\sec(c+\ldots}$$

Mathematica [A] time = 0.59, size = 107, normalized size = 0.52

$$\frac{\sec^4(c+dx)(1040\sin(2(c+dx)) - 120\sin(4(c+dx)) - 1300i\cos(2(c+dx)) + 75i\cos(4(c+dx)) - 351i)}{2340a^2d(\tan(c+dx)-i)^2\sqrt{a+ia\tan(c+dx)}\,(e\sec(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^(5/2)),x]
```

```
[Out] (Sec[c + d*x]^4*(-351*I - (1300*I)*Cos[2*(c + d*x)] + (75*I)*Cos[4*(c + d*x
)] + 1040*Sin[2*(c + d*x)] - 120*Sin[4*(c + d*x)]))/(2340*a^2*d*(e*Sec[c +
d*x])^(3/2)*(-I + Tan[c + d*x])^2*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.83, size = 111, normalized size = 0.54

$$\frac{\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\,\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(-195i\,e^{(10i\,dx+10i\,c)} + 2145i\,e^{(8i\,dx+8i\,c)} + 3042i\,e^{(6i\,dx+6i\,c)} + 962i\,e^{(4i\,dx+4i\,c)} + 305i\,e^{(2i\ldots}\right.}{4680\,a^3de^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fri
cas")
```

```
[Out] 1/4680*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*
(-195*I*e^(10*I*d*x + 10*I*c) + 2145*I*e^(8*I*d*x + 8*I*c) + 3042*I*e^(6*I*
d*x + 6*I*c) + 962*I*e^(4*I*d*x + 4*I*c) + 305*I*e^(2*I*d*x + 2*I*c) + 45*I
)*e^(-13/2*I*d*x - 13/2*I*c)/(a^3*d*e^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\sec(dx+c))^{\frac{3}{2}}\,(i\,a\tan(dx+c)+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="gia
c")
```

```
[Out] integrate(1/((e*sec(d*x + c))^(3/2)*(I*a*tan(d*x + c) + a)^(5/2)), x)
```

maple [A] time = 1.18, size = 159, normalized size = 0.77

$$2\left(\frac{e}{\cos(dx+c)}\right)^{\frac{3}{2}}\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\,\left(\cos^2(dx+c)\right)\left(180i\left(\cos^7(dx+c)\right) + 180\sin(dx+c)\left(\cos^6(dx+c)\right) - \ldots\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] 2/585/d*(e/cos(d*x+c))^(3/2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)
*cos(d*x+c)^2*(180*I*cos(d*x+c)^7+180*sin(d*x+c)*cos(d*x+c)^6-55*I*cos(d*x+
c)^5+35*sin(d*x+c)*cos(d*x+c)^4+8*I*cos(d*x+c)^3+48*cos(d*x+c)^2*sin(d*x+c)
+64*I*cos(d*x+c)+128*sin(d*x+c))/e^3/a^3
```

maxima [A] time = 0.97, size = 226, normalized size = 1.10

$$\frac{45i \cos\left(\frac{13}{2}dx + \frac{13}{2}c\right) + 260i \cos\left(\frac{9}{13}\arctan\left(\sin\left(\frac{13}{2}dx + \frac{13}{2}c\right), \cos\left(\frac{13}{2}dx + \frac{13}{2}c\right)\right)\right) + 702i \cos\left(\frac{5}{13}\arctan\left(\sin\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="max
ima")
```

```
[Out] 1/4680*(45*I*cos(13/2*d*x + 13/2*c) + 260*I*cos(9/13*arctan2(sin(13/2*d*x +
 13/2*c), cos(13/2*d*x + 13/2*c))) + 702*I*cos(5/13*arctan2(sin(13/2*d*x +
13/2*c), cos(13/2*d*x + 13/2*c))) - 195*I*cos(3/13*arctan2(sin(13/2*d*x + 1
3/2*c), cos(13/2*d*x + 13/2*c))) + 2340*I*cos(1/13*arctan2(sin(13/2*d*x + 1
3/2*c), cos(13/2*d*x + 13/2*c))) + 45*sin(13/2*d*x + 13/2*c) + 260*sin(9/13
*arctan2(sin(13/2*d*x + 13/2*c), cos(13/2*d*x + 13/2*c))) + 702*sin(5/13*ar
ctan2(sin(13/2*d*x + 13/2*c), cos(13/2*d*x + 13/2*c))) + 195*sin(3/13*arcta
n2(sin(13/2*d*x + 13/2*c), cos(13/2*d*x + 13/2*c))) + 2340*sin(1/13*arctan2
(sin(13/2*d*x + 13/2*c), cos(13/2*d*x + 13/2*c))))/(a^(5/2)*d*e^(3/2))
```

mupad [B] time = 4.72, size = 135, normalized size = 0.66

$$\frac{\sqrt{\frac{e}{\cos(c+d\,x)}}\,\left(\cos\left(2\,c+2\,d\,x\right)\,507\mathrm{i}+\cos\left(4\,c+4\,d\,x\right)\,260\mathrm{i}+\cos\left(6\,c+6\,d\,x\right)\,45\mathrm{i}+897\,\sin\left(2\,c+2\,d\,x\right)+260\,\sin\right.}{4680\,a^2\,d\,e^2\,\sqrt{\frac{a\,\left(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i}\right)}{\cos(2\,c+2\,d\,x)+1}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^(5/2)),x)
```

```
[Out] ((e/cos(c + d*x))^(1/2)*(cos(2*c + 2*d*x)*507i + cos(4*c + 4*d*x)*260i + co
s(6*c + 6*d*x)*45i + 897*sin(2*c + 2*d*x) + 260*sin(4*c + 4*d*x) + 45*sin(6
*c + 6*d*x) + 2340i))/(4680*a^2*d*e^2*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d
*x)*1i + 1))/(cos(2*c + 2*d*x) + 1))^(1/2))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))**(3/2)/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.437 $\int \frac{(e\sec(c+dx))^{7/3}}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=86

$$\frac{3i2^{2/3}a\sqrt[3]{1+i\tan(c+dx)}\,(e\sec(c+dx))^{7/3}\,{}_2F_1\left(\frac{1}{3},\frac{7}{6};\frac{13}{6};\frac{1}{2}(1-i\tan(c+dx))\right)}{7d(a+ia\tan(c+dx))^{3/2}}$$

```
[Out] 3/7*I*2^(2/3)*a*hypergeom([1/3, 7/6],[13/6],1/2-1/2*I*tan(d*x+c))*(e*sec(d*
x+c))^(7/3)*(1+I*tan(d*x+c))^(1/3)/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.21, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {3505, 3523, 70, 69}

$$\frac{3i2^{2/3}a\sqrt[3]{1+i\tan(c+dx)}\,(e\sec(c+dx))^{7/3}\text{Hypergeometric2F1}\left(\frac{1}{3},\frac{7}{6},\frac{13}{6},\frac{1}{2}(1-i\tan(c+dx))\right)}{7d(a+ia\tan(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(7/3)/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((3*I)/7)*2^(2/3)*a*Hypergeometric2F1[1/3, 7/6, 13/6, (1 - I*Tan[c + d*x])
/2]*(e*Sec[c + d*x])^(7/3)*(1 + I*Tan[c + d*x])^(1/3))/(d*(a + I*a*Tan[c +
d*x])^(3/2))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{7/3}}{\sqrt{a+ia\tan(c+dx)}}\,dx = \frac{(e\sec(c+dx))^{7/3}\int (a-ia\tan(c+dx))^{7/6}(a+ia\tan(c+dx))^{2/3}\,dx}{(a-ia\tan(c+dx))^{7/6}(a+ia\tan(c+dx))^{7/6}}$$
$$= \frac{\left(a^2(e\sec(c+dx))^{7/3}\right)\text{Subst}\left(\int \frac{\sqrt[6]{a-iax}}{\sqrt[3]{a+iax}}\,dx, x, \tan(c+dx)\right)}{d(a-ia\tan(c+dx))^{7/6}(a+ia\tan(c+dx))^{7/6}}$$
$$= \frac{\left(a^2(e\sec(c+dx))^{7/3}\sqrt[3]{\frac{a+ia\tan(c+dx)}{a}}\right)\text{Subst}\left(\int \frac{\sqrt[6]{a-iax}}{\sqrt[3]{\frac{1}{2}+\frac{ix}{2}}}\,dx, x, \tan(c+dx)\right)}{\sqrt[3]{2}\,d(a-ia\tan(c+dx))^{7/6}(a+ia\tan(c+dx))^{3/2}}$$
$$= \frac{3i2^{2/3}a\,{}_2F_1\left(\frac{1}{3},\frac{7}{6};\frac{13}{6};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx))^{7/3}\sqrt[3]{1+i\tan(c+dx)}}{7d(a+ia\tan(c+dx))^{3/2}}$$

Mathematica [A] time = 0.71, size = 118, normalized size = 1.37

$$-\frac{3i\sqrt[3]{2}\,e e^{i(c+dx)}\left(\frac{e e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{4/3}\left(4+\left(1+e^{2i(c+dx)}\right)^{5/6}{}_2F_1\left(\frac{2}{3},\frac{5}{6};\frac{5}{3};-e^{2i(c+dx)}\right)\right)}{5d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(7/3)/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((-3*I)/5)*2^(1/3)*e*E^(I*(c + d*x))*((e*E^(I*(c + d*x)))/(1 + E^((2*I)*(c
 + d*x))))^(4/3)*(4 + (1 + E^((2*I)*(c + d*x)))^(5/6)*Hypergeometric2F1[2/3
, 5/6, 5/3, -E^((2*I)*(c + d*x))]))/(d*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [F] time = 0.61, size = 0, normalized size = 0.00

$$\frac{-6i\cdot 2^{\frac{5}{6}}e^2\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(\frac{e}{e^{(2i\,dx+2i\,c)}+1}\right)^{\frac{1}{3}}e^{\left(\frac{4}{3}i\,dx+\frac{4}{3}i\,c\right)}+5\,ad\text{integral}\left(-\frac{2i\cdot 2^{\frac{5}{6}}e^2\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(\frac{e}{e^{(2i\,dx+2i\,c)}+1}\right)^{\frac{1}{3}}e^{\left(\frac{1}{3}i\,dx+\frac{1}{3}i\,c\right)}}{5\,ad},x\right)}{5\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/3)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="frica
s")
```

```
[Out] 1/5*(-6*I*2^(5/6)*e^2*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(e/(e^(2*I*d*x + 2*
I*c) + 1))^(1/3)*e^(4/3*I*d*x + 4/3*I*c) + 5*a*d*integral(-2/5*I*2^(5/6)*e^
2*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(e/(e^(2*I*d*x + 2*I*c) + 1))^(1/3)*e^(
1/3*I*d*x + 1/3*I*c)/(a*d), x))/(a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{7}{3}}}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/3)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] integrate((e*sec(d*x + c))^(7/3)/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [F] time = 1.16, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{7}{3}}}{\sqrt{a+ia\tan(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(7/3)/(a+I*a*tan(d*x+c))^(1/2),x)
[Out] int((e*sec(d*x+c))^(7/3)/(a+I*a*tan(d*x+c))^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{7}{3}}}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(7/3)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxim
a")
[Out] integrate((e*sec(d*x + c))^(7/3)/sqrt(I*a*tan(d*x + c) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{7/3}}{\sqrt{a+a\tan(c+d\,x)\,1\mathrm{i}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(7/3)/(a + a*tan(c + d*x)*1i)^(1/2),x)
[Out] int((e/cos(c + d*x))^(7/3)/(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(7/3)/(a+I*a*tan(d*x+c))**(1/2),x)
[Out] Timed out
```

3.438 $\int \frac{(e\sec(c+dx))^{5/3}}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=86

$$\frac{3i\sqrt[3]{2}\,a(1+i\tan(c+dx))^{2/3}(e\sec(c+dx))^{5/3}\,{}_2F_1\left(\frac{2}{3},\frac{5}{6};\frac{11}{6};\frac{1}{2}(1-i\tan(c+dx))\right)}{5d(a+ia\tan(c+dx))^{3/2}}$$

```
[Out] 3/5*I*2^(1/3)*a*hypergeom([2/3, 5/6],[11/6],1/2-1/2*I*tan(d*x+c))*(e*sec(d*
x+c))^(5/3)*(1+I*tan(d*x+c))^(2/3)/d/(a+I*a*tan(d*x+c))^(3/2)
```

Rubi [A] time = 0.20, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {3505, 3523, 70, 69}

$$\frac{3i\sqrt[3]{2}\,a(1+i\tan(c+dx))^{2/3}(e\sec(c+dx))^{5/3}\text{Hypergeometric2F1}\left(\frac{2}{3},\frac{5}{6},\frac{11}{6},\frac{1}{2}(1-i\tan(c+dx))\right)}{5d(a+ia\tan(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(5/3)/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((3*I)/5)*2^(1/3)*a*Hypergeometric2F1[2/3, 5/6, 11/6, (1 - I*Tan[c + d*x])
/2]*(e*Sec[c + d*x])^(5/3)*(1 + I*Tan[c + d*x])^(2/3))/(d*(a + I*a*Tan[c +
d*x])^(3/2))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{5/3}}{\sqrt{a+ia\tan(c+dx)}}\,dx = \frac{(e\sec(c+dx))^{5/3}\int (a-ia\tan(c+dx))^{5/6}\sqrt[3]{a+ia\tan(c+dx)}\,dx}{(a-ia\tan(c+dx))^{5/6}(a+ia\tan(c+dx))^{5/6}}$$

$$= \frac{\left(a^2(e\sec(c+dx))^{5/3}\right)\text{Subst}\left(\int \frac{1}{\sqrt[6]{a-iax}\,(a+iax)^{2/3}}\,dx, x, \tan(c+dx)\right)}{d(a-ia\tan(c+dx))^{5/6}(a+ia\tan(c+dx))^{5/6}}$$

$$= \frac{\left(a^2(e\sec(c+dx))^{5/3}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{2/3}\right)\text{Subst}\left(\int \frac{1}{\left(\frac{1}{2}+\frac{ix}{2}\right)^{2/3}\sqrt[6]{a-iax}}\,dx, x, \tan(c+dx)\right)}{2^{2/3}d(a-ia\tan(c+dx))^{5/6}(a+ia\tan(c+dx))^{3/2}}$$

$$= \frac{3i\sqrt[3]{2}\,a\,{}_2F_1\left(\frac{2}{3},\frac{5}{6};\frac{11}{6};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx))^{5/3}(1+i\tan(c+dx))^{2/3}}{5d(a+ia\tan(c+dx))^{3/2}}$$

Mathematica [A] time = 0.60, size = 116, normalized size = 1.35

$$\frac{3i2^{2/3}ee^{i(c+dx)}\left(\frac{ee^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{2/3}\left(-2+\sqrt[6]{1+e^{2i(c+dx)}}\,{}_2F_1\left(\frac{1}{6},\frac{1}{3};\frac{4}{3};-e^{2i(c+dx)}\right)\right)}{d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(5/3)/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((3*I)*2^(2/3)*e*E^(I*(c + d*x))*((e*E^(I*(c + d*x)))/(1 + E^((2*I)*(c + d*
x))))^(2/3)*(-2 + (1 + E^((2*I)*(c + d*x)))^(1/6)*Hypergeometric2F1[1/6, 1/
3, 4/3, -E^((2*I)*(c + d*x))]))/(d*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [F] time = 0.76, size = 0, normalized size = 0.00

$$\frac{2\cdot 2^{\frac{1}{6}}\left(-3i\,ee^{(2i\,dx+2i\,c)}-3i\,e\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(\frac{e}{e^{(2i\,dx+2i\,c)}+1}\right)^{\frac{2}{3}}e^{\left(\frac{2}{3}i\,dx+\frac{2}{3}i\,c\right)}+ad\text{integral}\left(\frac{2^{\frac{1}{6}}\left(i\,ee^{(2i\,dx+2i\,c)}+i\,e\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(\right.}{ad}\right.}{ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/3)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="frica
s")
```

```
[Out] (2*2^(1/6)*(-3*I*e*e^(2*I*d*x + 2*I*c) - 3*I*e)*sqrt(a/(e^(2*I*d*x + 2*I*c)
 + 1))*(e/(e^(2*I*d*x + 2*I*c) + 1))^(2/3)*e^(2/3*I*d*x + 2/3*I*c) + a*d*in
tegral(2^(1/6)*(I*e*e^(2*I*d*x + 2*I*c) + I*e)*sqrt(a/(e^(2*I*d*x + 2*I*c)
+ 1))*(e/(e^(2*I*d*x + 2*I*c) + 1))^(2/3)*e^(-4/3*I*d*x - 4/3*I*c)/(a*d), x
))/(a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{5}{3}}}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/3)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] integrate((e*sec(d*x + c))^(5/3)/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [F] time = 1.16, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{5}{3}}}{\sqrt{a+ia\tan(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(5/3)/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] int((e*sec(d*x+c))^(5/3)/(a+I*a*tan(d*x+c))^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{5}{3}}}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/3)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxim
a")
```

```
[Out] integrate((e*sec(d*x + c))^(5/3)/sqrt(I*a*tan(d*x + c) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{5/3}}{\sqrt{a+a\tan(c+d\,x)\,1\mathrm{i}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(5/3)/(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] int((e/cos(c + d*x))^(5/3)/(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(5/3)/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

3.439 $\int \frac{(e\sec(c+dx))^{2/3}}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=85

$$\frac{3i\sqrt[6]{1+i\tan(c+dx)}\,(e\sec(c+dx))^{2/3}\,{}_2F_1\left(\frac{1}{3},\frac{7}{6};\frac{4}{3};\frac{1}{2}(1-i\tan(c+dx))\right)}{2\sqrt[6]{2}\,d\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] 3/4*I*hypergeom([1/3, 7/6],[4/3],1/2-1/2*I*tan(d*x+c))*(e*sec(d*x+c))^(2/3)
*(1+I*tan(d*x+c))^(1/6)*2^(5/6)/d/(a+I*a*tan(d*x+c))^(1/2)
```

Rubi [A] time = 0.19, antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {3505, 3523, 70, 69}

$$\frac{3i\sqrt[6]{1+i\tan(c+dx)}\,(e\sec(c+dx))^{2/3}\text{Hypergeometric2F1}\left(\frac{1}{3},\frac{7}{6},\frac{4}{3},\frac{1}{2}(1-i\tan(c+dx))\right)}{2\sqrt[6]{2}\,d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(2/3)/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((3*I)/2)*Hypergeometric2F1[1/3, 7/6, 4/3, (1 - I*Tan[c + d*x])/2]*(e*Sec[
c + d*x])^(2/3)*(1 + I*Tan[c + d*x])^(1/6))/(2^(1/6)*d*Sqrt[a + I*a*Tan[c +
 d*x]])
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^{2/3}}{\sqrt{a+ia\tan(c+dx)}}\,dx = \frac{(e\sec(c+dx))^{2/3}\int \frac{\sqrt[3]{a-ia\tan(c+dx)}}{\sqrt[6]{a+ia\tan(c+dx)}}\,dx}{\sqrt[3]{a-ia\tan(c+dx)}\,\sqrt[3]{a+ia\tan(c+dx)}}$$
$$= \frac{\left(a^2(e\sec(c+dx))^{2/3}\right)\text{Subst}\left(\int \frac{1}{(a-iax)^{2/3}(a+iax)^{7/6}}\,dx, x, \tan(c+dx)\right)}{d\sqrt[3]{a-ia\tan(c+dx)}\,\sqrt[3]{a+ia\tan(c+dx)}}$$
$$= \frac{\left(a(e\sec(c+dx))^{2/3}\sqrt[6]{\frac{a+ia\tan(c+dx)}{a}}\right)\text{Subst}\left(\int \frac{1}{\left(\frac{1}{2}+\frac{ix}{2}\right)^{7/6}(a-iax)^{2/3}}\,dx, x, \tan(c+dx)\right)}{2\sqrt[6]{2}\,d\sqrt[3]{a-ia\tan(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}$$
$$= \frac{3i\,{}_2F_1\left(\frac{1}{3},\frac{7}{6};\frac{4}{3};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx))^{2/3}\sqrt[6]{1+i\tan(c+dx)}}{2\sqrt[6]{2}\,d\sqrt{a+ia\tan(c+dx)}}$$

Mathematica [A] time = 0.46, size = 116, normalized size = 1.36

$$\frac{3i\sqrt[6]{2}\,\sqrt[6]{1+e^{2i(c+dx)}}\left(\frac{ee^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{2/3}{}_2F_1\left(-\frac{1}{6},\frac{1}{6};\frac{5}{6};-e^{2i(c+dx)}\right)}{d\sqrt{\frac{ae^{2i(c+dx)}}{1+e^{2i(c+dx)}}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(2/3)/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((3*I)*2^(1/6)*((e*E^(I*(c + d*x)))/(1 + E^((2*I)*(c + d*x))))^(2/3)*(1 + E
^((2*I)*(c + d*x)))^(1/6)*Hypergeometric2F1[-1/6, 1/6, 5/6, -E^((2*I)*(c +
d*x))])/(d*Sqrt[(a*E^((2*I)*(c + d*x)))/(1 + E^((2*I)*(c + d*x)))])
```

fricas [F] time = 0.81, size = 0, normalized size = 0.00

$$\frac{2^{\frac{1}{6}}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(\frac{e}{e^{(2i\,dx+2i\,c)}+1}\right)^{\frac{2}{3}}\left(3i\,e^{(4i\,dx+4i\,c)}+6i\,e^{(2i\,dx+2i\,c)}+3i\right)e^{\left(\frac{2}{3}i\,dx+\frac{2}{3}i\,c\right)}+\left(ade^{(3i\,dx+3i\,c)}-2\,ade^{(2i\,dx+2i\,c)}+ade^{(\cdots}\right.}{ade^{(3i\,dx+3i\,c)}-2\,ade^{(2i\,dx+2i\cdots}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(2/3)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="frica
s")
```

```
[Out] (2^(1/6)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(e/(e^(2*I*d*x + 2*I*c) + 1))^(2
/3)*(3*I*e^(4*I*d*x + 4*I*c) + 6*I*e^(2*I*d*x + 2*I*c) + 3*I)*e^(2/3*I*d*x
+ 2/3*I*c) + (a*d*e^(3*I*d*x + 3*I*c) - 2*a*d*e^(2*I*d*x + 2*I*c) + a*d*e^(
I*d*x + I*c))*integral(2^(1/6)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(e/(e^(2*I
*d*x + 2*I*c) + 1))^(2/3)*(I*e^(4*I*d*x + 4*I*c) + 7*I*e^(3*I*d*x + 3*I*c)
+ 5*I*e^(2*I*d*x + 2*I*c) + 7*I*e^(I*d*x + I*c) + 4*I)*e^(2/3*I*d*x + 2/3*I
*c)/(a*d*e^(4*I*d*x + 4*I*c) - 3*a*d*e^(3*I*d*x + 3*I*c) + 3*a*d*e^(2*I*d*x
 + 2*I*c) - a*d*e^(I*d*x + I*c)), x))/(a*d*e^(3*I*d*x + 3*I*c) - 2*a*d*e^(2
*I*d*x + 2*I*c) + a*d*e^(I*d*x + I*c))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{2}{3}}}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(2/3)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] integrate((e*sec(d*x + c))^(2/3)/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [F] time = 1.40, size = 0, normalized size = 0.00

$$\int \frac{\left(e \sec \left(dx+c\right)\right)^{\frac{2}{3}}}{\sqrt{a+ia \tan \left(dx+c\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(2/3)/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] int((e*sec(d*x+c))^(2/3)/(a+I*a*tan(d*x+c))^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(e \sec \left(dx+c\right)\right)^{\frac{2}{3}}}{\sqrt{i\, a \tan \left(dx+c\right)+a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(2/3)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxim
a")
```

```
[Out] integrate((e*sec(d*x + c))^(2/3)/sqrt(I*a*tan(d*x + c) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{2/3}}{\sqrt{a+a \tan\left(c+d\,x\right)\,1{}\mathrm{i}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(2/3)/(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] int((e/cos(c + d*x))^(2/3)/(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(e \sec \left(c+dx\right)\right)^{\frac{2}{3}}}{\sqrt{ia \left(\tan \left(c+dx\right)-i\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(2/3)/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral((e*sec(c + d*x))**(2/3)/sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.440 $\int \frac{\sqrt[3]{e \sec(c+dx)}}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=83

$$\frac{3i\sqrt[3]{1+i\tan(c+dx)}\,\sqrt[3]{e\sec(c+dx)}\,{}_2F_1\left(\frac{1}{6},\frac{4}{3};\frac{7}{6};\frac{1}{2}(1-i\tan(c+dx))\right)}{\sqrt[3]{2}\,d\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] 3/2*I*hypergeom([1/6, 4/3],[7/6],1/2-1/2*I*tan(d*x+c))*(e*sec(d*x+c))^(1/3)
*(1+I*tan(d*x+c))^(1/3)*2^(2/3)/d/(a+I*a*tan(d*x+c))^(1/2)
```

Rubi [A] time = 0.18, antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {3505, 3523, 70, 69}

$$\frac{3i\sqrt[3]{1+i\tan(c+dx)}\,\sqrt[3]{e\sec(c+dx)}\,\text{Hypergeometric2F1}\left(\frac{1}{6},\frac{4}{3},\frac{7}{6},\frac{1}{2}(1-i\tan(c+dx))\right)}{\sqrt[3]{2}\,d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(1/3)/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((3*I)*Hypergeometric2F1[1/6, 4/3, 7/6, (1 - I*Tan[c + d*x])/2]*(e*Sec[c +
d*x])^(1/3)*(1 + I*Tan[c + d*x])^(1/3))/(2^(1/3)*d*Sqrt[a + I*a*Tan[c + d*x
]])
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{\sqrt[3]{e\sec(c+dx)}}{\sqrt{a+ia\tan(c+dx)}}\,dx = \frac{\sqrt[3]{e\sec(c+dx)}\int \frac{\sqrt[6]{a-ia\tan(c+dx)}}{\sqrt[3]{a+ia\tan(c+dx)}}\,dx}{\sqrt[6]{a-ia\tan(c+dx)}\,\sqrt[6]{a+ia\tan(c+dx)}}$$

$$= \frac{\left(a^2\sqrt[3]{e\sec(c+dx)}\right)\text{Subst}\left(\int \frac{1}{(a-iax)^{5/6}(a+iax)^{4/3}}\,dx, x, \tan(c+dx)\right)}{d\sqrt[6]{a-ia\tan(c+dx)}\,\sqrt[6]{a+ia\tan(c+dx)}}$$

$$= \frac{\left(a\sqrt[3]{e\sec(c+dx)}\sqrt[3]{\frac{a+ia\tan(c+dx)}{a}}\right)\text{Subst}\left(\int \frac{1}{\left(\frac{1}{2}+\frac{ix}{2}\right)^{4/3}(a-iax)^{5/6}}\,dx, x, \tan(c+dx)\right)}{2\sqrt[3]{2}\,d\sqrt[6]{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}$$

$$= \frac{3i\,{}_2F_1\left(\frac{1}{6},\frac{4}{3};\frac{7}{6};\frac{1}{2}(1-i\tan(c+dx))\right)\sqrt[3]{e\sec(c+dx)}\,\sqrt[3]{1+i\tan(c+dx)}}{\sqrt[3]{2}\,d\sqrt{a+ia\tan(c+dx)}}$$

Mathematica [A] time = 0.57, size = 95, normalized size = 1.14

$$\frac{3\left(8i-\frac{2ie^{2i(c+dx)}\,{}_2F_1\left(\frac{2}{3},\frac{5}{6};\frac{5}{3};-e^{2i(c+dx)}\right)}{\sqrt[6]{1+e^{2i(c+dx)}}}\right)\sqrt[3]{e\sec(c+dx)}}{16d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(1/3)/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (3*(8*I - ((2*I)*E^((2*I)*(c + d*x))*Hypergeometric2F1[2/3, 5/6, 5/3, -E^((
2*I)*(c + d*x))])/(1 + E^((2*I)*(c + d*x)))^(1/6))*(e*Sec[c + d*x])^(1/3))/
(16*d*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [F] time = 0.73, size = 0, normalized size = 0.00

$$\frac{\left(4\,ade^{(i\,dx+i\,c)}\text{integral}\left(-\frac{i\cdot 2^{\frac{5}{6}}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(\frac{e}{e^{(2i\,dx+2i\,c)}+1}\right)^{\frac{1}{3}}e^{\left(\frac{1}{3}i\,dx+\frac{1}{3}i\,c\right)}}{4\,ad}, x\right)+2^{\frac{5}{6}}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(\frac{e}{e^{(2i\,dx+2i\,c)}+1}\right)^{\frac{1}{3}}\left(3i\,e^{(2i\,dx+2i\,c)}\right.\right.}{4\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/3)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="frica
s")
```

```
[Out] 1/4*(4*a*d*e^(I*d*x + I*c)*integral(-1/4*I*2^(5/6)*sqrt(a/(e^(2*I*d*x + 2*I
*c) + 1))*(e/(e^(2*I*d*x + 2*I*c) + 1))^(1/3)*e^(1/3*I*d*x + 1/3*I*c)/(a*d)
, x) + 2^(5/6)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(e/(e^(2*I*d*x + 2*I*c) +
1))^(1/3)*(3*I*e^(2*I*d*x + 2*I*c) + 3*I)*e^(1/3*I*d*x + 1/3*I*c))*e^(-I*d*
x - I*c)/(a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{1}{3}}}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/3)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] integrate((e*sec(d*x + c))^(1/3)/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [F] time = 1.35, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{1}{3}}}{\sqrt{a+ia\tan(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(1/3)/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] int((e*sec(d*x+c))^(1/3)/(a+I*a*tan(d*x+c))^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^{\frac{1}{3}}}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/3)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxim
a")
```

```
[Out] integrate((e*sec(d*x + c))^(1/3)/sqrt(I*a*tan(d*x + c) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^{1/3}}{\sqrt{a+a\tan(c+d\,x)\,1\mathrm{i}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(1/3)/(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] int((e/cos(c + d*x))^(1/3)/(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt[3]{e\sec(c+dx)}}{\sqrt{ia(\tan(c+dx)-i)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(1/3)/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral((e*sec(c + d*x))**(1/3)/sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.441 $\int \frac{1}{\sqrt[3]{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=83

$$-\frac{3i(1+i\tan(c+dx))^{2/3}\,{}_2F_1\left(-\frac{1}{6},\frac{5}{3};\frac{5}{6};\frac{1}{2}(1-i\tan(c+dx))\right)}{2^{2/3}d\sqrt{a+ia\tan(c+dx)}\sqrt[3]{e\sec(c+dx)}}$$

```
[Out] -3/2*I*hypergeom([-1/6, 5/3],[5/6],1/2-1/2*I*tan(d*x+c))*(1+I*tan(d*x+c))^(
2/3)*2^(1/3)/d/(e*sec(d*x+c))^(1/3)/(a+I*a*tan(d*x+c))^(1/2)
```

Rubi [A] time = 0.20, antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {3505, 3523, 70, 69}

$$-\frac{3i(1+i\tan(c+dx))^{2/3}\text{Hypergeometric2F1}\left(-\frac{1}{6},\frac{5}{3},\frac{5}{6},\frac{1}{2}(1-i\tan(c+dx))\right)}{2^{2/3}d\sqrt{a+ia\tan(c+dx)}\sqrt[3]{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Sec[c + d*x])^(1/3)*Sqrt[a + I*a*Tan[c + d*x]]),x]
```

```
[Out] ((-3*I)*Hypergeometric2F1[-1/6, 5/3, 5/6, (1 - I*Tan[c + d*x])/2]*(1 + I*Ta
n[c + d*x])^(2/3))/(2^(2/3)*d*(e*Sec[c + d*x])^(1/3)*Sqrt[a + I*a*Tan[c + d
*x]])
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{1}{\sqrt[3]{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}}\,dx = \frac{\left(\sqrt[6]{a-ia\tan(c+dx)}\sqrt[6]{a+ia\tan(c+dx)}\right)\int \frac{1}{\sqrt[6]{a-ia\tan(c+dx)}\,(a+ia\tan(c+a}}{\sqrt[3]{e\sec(c+dx)}}$$
$$= \frac{\left(a^2\sqrt[6]{a-ia\tan(c+dx)}\sqrt[6]{a+ia\tan(c+dx)}\right)\text{Subst}\left(\int \frac{1}{(a-iax)^{7/6}(a+iax)^5}\right.}{d\sqrt[3]{e\sec(c+dx)}}$$
$$= \frac{\left(a\sqrt[6]{a-ia\tan(c+dx)}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{2/3}\right)\text{Subst}\left(\int \frac{1}{\left(\frac{1}{2}+\frac{ix}{2}\right)^{5/3}(a-iax)^{7/6}}dx\right.}{2\,2^{2/3}d\sqrt[3]{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}}$$
$$= -\frac{3i\,{}_2F_1\left(-\frac{1}{6},\frac{5}{3};\frac{5}{6};\frac{1}{2}(1-i\tan(c+dx))\right)(1+i\tan(c+dx))^{2/3}}{2^{2/3}d\sqrt[3]{e\sec(c+dx)}\sqrt{a+ia\tan(c+dx)}}$$

Mathematica [A] time = 0.81, size = 95, normalized size = 1.14

$$\frac{12i-\frac{30ie^{2i(c+dx)}\,{}_2F_1\left(\frac{1}{6},\frac{1}{3};\frac{4}{3};-e^{2i(c+dx)}\right)}{\left(1+e^{2i(c+dx)}\right)^{5/6}}}{16d\sqrt{a+ia\tan(c+dx)}\sqrt[3]{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Sec[c + d*x])^(1/3)*Sqrt[a + I*a*Tan[c + d*x]]),x]
```

```
[Out] (12*I - ((30*I)*E^((2*I)*(c + d*x))*Hypergeometric2F1[1/6, 1/3, 4/3, -E^((2
*I)*(c + d*x))])/(1 + E^((2*I)*(c + d*x)))^(5/6))/(16*d*(e*Sec[c + d*x])^(1
/3)*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [F] time = 0.74, size = 0, normalized size = 0.00

$$\frac{2^{\frac{1}{6}}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(\frac{e}{e^{(2i\,dx+2i\,c)}+1}\right)^{\frac{2}{3}}\left(-12i\,e^{(6i\,dx+6i\,c)}-27i\,e^{(4i\,dx+4i\,c)}-18i\,e^{(2i\,dx+2i\,c)}-3i\right)e^{\left(\frac{2}{3}i\,dx+\frac{2}{3}i\,c\right)}+8\left(adee^{(4i\,dx+4i\,c)}-\right.}{8\left(adee^{(4i\,dx+4i\,c)}-adee^{(2i\,d}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(1/3)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fri
cas")
```

```
[Out] 1/8*(2^(1/6)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(e/(e^(2*I*d*x + 2*I*c) + 1)
)^(2/3)*(-12*I*e^(6*I*d*x + 6*I*c) - 27*I*e^(4*I*d*x + 4*I*c) - 18*I*e^(2*I
*d*x + 2*I*c) - 3*I)*e^(2/3*I*d*x + 2/3*I*c) + 8*(a*d*e*e^(4*I*d*x + 4*I*c)
 - a*d*e*e^(2*I*d*x + 2*I*c))*integral(1/16*2^(1/6)*sqrt(a/(e^(2*I*d*x + 2*
I*c) + 1))*(e/(e^(2*I*d*x + 2*I*c) + 1))^(2/3)*(-45*I*e^(4*I*d*x + 4*I*c) -
 60*I*e^(2*I*d*x + 2*I*c) - 15*I)*e^(2/3*I*d*x + 2/3*I*c)/(a*d*e*e^(6*I*d*x
 + 6*I*c) - 2*a*d*e*e^(4*I*d*x + 4*I*c) + a*d*e*e^(2*I*d*x + 2*I*c)), x))/(
a*d*e*e^(4*I*d*x + 4*I*c) - a*d*e*e^(2*I*d*x + 2*I*c))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\sec(dx+c))^{\frac{1}{3}}\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(1/3)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="gia
c")
```

```
[Out] integrate(1/((e*sec(d*x + c))^(1/3)*sqrt(I*a*tan(d*x + c) + a)), x)
```

maple [F] time = 1.36, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(e \sec \left(dx+c\right)\right)^{\frac{1}{3}} \sqrt{a+ia \tan \left(dx+c\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*sec(d*x+c))^(1/3)/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] int(1/(e*sec(d*x+c))^(1/3)/(a+I*a*tan(d*x+c))^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(e \sec \left(dx+c\right)\right)^{\frac{1}{3}} \sqrt{i\, a \tan \left(dx+c\right)+a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(1/3)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="max
ima")
```

```
[Out] integrate(1/((e*sec(d*x + c))^(1/3)*sqrt(I*a*tan(d*x + c) + a)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(\frac{e}{\cos \left(c+d\,x\right)}\right)}^{1/3}\,\sqrt{a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e/cos(c + d*x))^(1/3)*(a + a*tan(c + d*x)*1i)^(1/2)),x)
```

```
[Out] int(1/((e/cos(c + d*x))^(1/3)*(a + a*tan(c + d*x)*1i)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt[3]{e \sec \left(c+dx\right)} \sqrt{ia \left(\tan \left(c+dx\right)-i\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))**(1/3)/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(1/((e*sec(c + d*x))**(1/3)*sqrt(I*a*(tan(c + d*x) - I))), x)
```

3.442 $\int \frac{1}{(e\sec(c+dx))^{4/3}\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=88

$$-\frac{3i\sqrt[6]{1+i\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}\;{}_2F_1\left(-\frac{2}{3},\frac{13}{6};\frac{1}{3};\frac{1}{2}(1-i\tan(c+dx))\right)}{8\sqrt[6]{2}\,ad(e\sec(c+dx))^{4/3}}$$

```
[Out] -3/16*I*hypergeom([-2/3, 13/6],[1/3],1/2-1/2*I*tan(d*x+c))*(a+I*a*tan(d*x+c
))^(1/2)*(1+I*tan(d*x+c))^(1/6)*2^(5/6)/a/d/(e*sec(d*x+c))^(4/3)
```

Rubi [A] time = 0.21, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {3505, 3523, 70, 69}

$$-\frac{3i\sqrt[6]{1+i\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}\,\text{Hypergeometric2F1}\left(-\frac{2}{3},\frac{13}{6},\frac{1}{3},\frac{1}{2}(1-i\tan(c+dx))\right)}{8\sqrt[6]{2}\,ad(e\sec(c+dx))^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Sec[c + d*x])^(4/3)*Sqrt[a + I*a*Tan[c + d*x]]),x]
```

```
[Out] (((-3*I)/8)*Hypergeometric2F1[-2/3, 13/6, 1/3, (1 - I*Tan[c + d*x])/2]*(1 +
 I*Tan[c + d*x])^(1/6)*Sqrt[a + I*a*Tan[c + d*x]])/(2^(1/6)*a*d*(e*Sec[c +
d*x])^(4/3))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{1}{(e\sec(c+dx))^{4/3}\sqrt{a+ia\tan(c+dx)}}dx = \frac{\left((a-ia\tan(c+dx))^{2/3}(a+ia\tan(c+dx))^{2/3}\right)\int \frac{1}{(a-ia\tan(c+dx))^{2/3}(}}{(e\sec(c+dx))^{4/3}}$$
$$= \frac{\left(a^2(a-ia\tan(c+dx))^{2/3}(a+ia\tan(c+dx))^{2/3}\right)\text{Subst}\left(\int \frac{}{(a-iax)}\right.}{d(e\sec(c+dx))^{4/3}}$$
$$= \frac{\left((a-ia\tan(c+dx))^{2/3}\sqrt{a+ia\tan(c+dx)}\sqrt[6]{\frac{a+ia\tan(c+dx)}{a}}\right)\text{Subs}}{4\sqrt[6]{2}d(e\sec(c+dx))^{4/3}}$$
$$= -\frac{3i\,{}_2F_1\left(-\frac{2}{3},\frac{13}{6};\frac{1}{3};\frac{1}{2}(1-i\tan(c+dx))\right)\sqrt[6]{1+i\tan(c+dx)}\sqrt{a+}}{8\sqrt[6]{2}ad(e\sec(c+dx))^{4/3}}$$

Mathematica [A] time = 0.71, size = 112, normalized size = 1.27

$$-\frac{3i\sec^2(c+dx)\left(-55\sqrt[6]{1+e^{2i(c+dx)}}\,{}_2F_1\left(-\frac{1}{6},\frac{1}{6};\frac{5}{6};-e^{2i(c+dx)}\right)+11i\sin(2(c+dx))+3\cos(2(c+dx))+3\right)}{112d\sqrt{a+ia\tan(c+dx)}(e\sec(c+dx))^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Sec[c + d*x])^(4/3)*Sqrt[a + I*a*Tan[c + d*x]]),x]
```

```
[Out] (((-3*I)/112)*Sec[c + d*x]^2*(3 + 3*Cos[2*(c + d*x)] - 55*(1 + E^((2*I)*(c
+ d*x)))^(1/6)*Hypergeometric2F1[-1/6, 1/6, 5/6, -E^((2*I)*(c + d*x))] + (1
1*I)*Sin[2*(c + d*x)]))/(d*(e*Sec[c + d*x])^(4/3)*Sqrt[a + I*a*Tan[c + d*x]
])
```

fricas [F] time = 0.69, size = 0, normalized size = 0.00

$$2^{\frac{1}{6}}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(\frac{e}{e^{(2i\,dx+2i\,c)}+1}\right)^{\frac{2}{3}}\left(-21i\,e^{(8i\,dx+8i\,c)}+42i\,e^{(7i\,dx+7i\,c)}+114i\,e^{(6i\,dx+6i\,c)}+60i\,e^{(5i\,dx+5i\,c)}+303i\,e^{(4i\,dx+4i}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(4/3)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fri
cas")
```

```
[Out] 1/112*(2^(1/6)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(e/(e^(2*I*d*x + 2*I*c) +
1))^(2/3)*(-21*I*e^(8*I*d*x + 8*I*c) + 42*I*e^(7*I*d*x + 7*I*c) + 114*I*e^(
6*I*d*x + 6*I*c) + 60*I*e^(5*I*d*x + 5*I*c) + 303*I*e^(4*I*d*x + 4*I*c) - 6
*I*e^(3*I*d*x + 3*I*c) + 180*I*e^(2*I*d*x + 2*I*c) - 24*I*e^(I*d*x + I*c) +
 12*I)*e^(2/3*I*d*x + 2/3*I*c) + 112*(a*d*e^2*e^(5*I*d*x + 5*I*c) - 2*a*d*e
^2*e^(4*I*d*x + 4*I*c) + a*d*e^2*e^(3*I*d*x + 3*I*c))*integral(1/112*2^(1/6
)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(e/(e^(2*I*d*x + 2*I*c) + 1))^(2/3)*(55
*I*e^(4*I*d*x + 4*I*c) + 385*I*e^(3*I*d*x + 3*I*c) + 275*I*e^(2*I*d*x + 2*I
*c) + 385*I*e^(I*d*x + I*c) + 220*I)*e^(2/3*I*d*x + 2/3*I*c)/(a*d*e^2*e^(4*
I*d*x + 4*I*c) - 3*a*d*e^2*e^(3*I*d*x + 3*I*c) + 3*a*d*e^2*e^(2*I*d*x + 2*I
*c) - a*d*e^2*e^(I*d*x + I*c)), x))/(a*d*e^2*e^(5*I*d*x + 5*I*c) - 2*a*d*e^
2*e^(4*I*d*x + 4*I*c) + a*d*e^2*e^(3*I*d*x + 3*I*c))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\sec(dx+c))^{\frac{4}{3}}\sqrt{i\,a\tan(dx+c)+a}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(4/3)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="gia
c")
```

```
[Out] integrate(1/((e*sec(d*x + c))^(4/3)*sqrt(I*a*tan(d*x + c) + a)), x)
```

maple [F] time = 1.26, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(e \sec \left(dx+c\right)\right)^{\frac{4}{3}} \sqrt{a+ia \tan \left(dx+c\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*sec(d*x+c))^(4/3)/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] int(1/(e*sec(d*x+c))^(4/3)/(a+I*a*tan(d*x+c))^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(e \sec \left(dx+c\right)\right)^{\frac{4}{3}} \sqrt{i\, a \tan \left(dx+c\right)+a}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))^(4/3)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="max
ima")
```

```
[Out] integrate(1/((e*sec(d*x + c))^(4/3)*sqrt(I*a*tan(d*x + c) + a)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(\frac{e}{\cos(c+d\,x)}\right)}^{4/3}\,\sqrt{a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e/cos(c + d*x))^(4/3)*(a + a*tan(c + d*x)*1i)^(1/2)),x)
```

```
[Out] int(1/((e/cos(c + d*x))^(4/3)*(a + a*tan(c + d*x)*1i)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(e \sec \left(c+dx\right)\right)^{\frac{4}{3}} \sqrt{ia \left(\tan \left(c+dx\right)-i\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*sec(d*x+c))**(4/3)/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(1/((e*sec(c + d*x))**(4/3)*sqrt(I*a*(tan(c + d*x) - I))), x)
```

3.443 $\int \frac{(d\sec(e+fx))^{2/3}}{(a+ia\tan(e+fx))^{7/3}}\,dx$

Optimal. Leaf size=437

$$\frac{5i\tan^{-1}\left(\frac{\sqrt[3]{a}+2^{2/3}\sqrt[3]{a-ia\tan(e+fx)}}{\sqrt{3}\sqrt[3]{a}}\right)(d\sec(e+fx))^{2/3}}{12\,2^{2/3}\sqrt{3}\,a^{5/3}f\sqrt[3]{a-ia\tan(e+fx)}\sqrt[3]{a+ia\tan(e+fx)}}-\frac{5x(d\sec(e+fx))^{2/3}}{72\,2^{2/3}a^{5/3}\sqrt[3]{a-ia\tan(e+fx)}\sqrt[3]{a+ia\tan(e+fx)}}-$$

```
[Out] 1/4*I*(d*sec(f*x+e))^(2/3)/f/(a+I*a*tan(f*x+e))^(7/3)-5/144*x*(d*sec(f*x+e)
)^(2/3)*2^(1/3)/a^(5/3)/(a-I*a*tan(f*x+e))^(1/3)/(a+I*a*tan(f*x+e))^(1/3)-5
/144*I*ln(cos(f*x+e))*(d*sec(f*x+e))^(2/3)*2^(1/3)/a^(5/3)/f/(a-I*a*tan(f*x
+e))^(1/3)/(a+I*a*tan(f*x+e))^(1/3)-5/48*I*ln(2^(1/3)*a^(1/3)-(a-I*a*tan(f*
x+e))^(1/3))*(d*sec(f*x+e))^(2/3)*2^(1/3)/a^(5/3)/f/(a-I*a*tan(f*x+e))^(1/3
)/(a+I*a*tan(f*x+e))^(1/3)+5/72*I*arctan(1/3*(a^(1/3)+2^(2/3)*(a-I*a*tan(f*
x+e))^(1/3))/a^(1/3)*3^(1/2))*(d*sec(f*x+e))^(2/3)*2^(1/3)/a^(5/3)/f*3^(1/2
)/(a-I*a*tan(f*x+e))^(1/3)/(a+I*a*tan(f*x+e))^(1/3)+5/24*I*(d*sec(f*x+e))^(
2/3)/f/(a+I*a*tan(f*x+e))^(1/3)/(a^2+I*a^2*tan(f*x+e))
```

Rubi [A] time = 0.40, antiderivative size = 437, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {3505, 3522, 3487, 51, 57, 617, 204, 31}

$$\frac{5i\tan^{-1}\left(\frac{\sqrt[3]{a}+2^{2/3}\sqrt[3]{a-ia\tan(e+fx)}}{\sqrt{3}\sqrt[3]{a}}\right)(d\sec(e+fx))^{2/3}}{12\,2^{2/3}\sqrt{3}\,a^{5/3}f\sqrt[3]{a-ia\tan(e+fx)}\sqrt[3]{a+ia\tan(e+fx)}}-\frac{5x(d\sec(e+fx))^{2/3}}{72\,2^{2/3}a^{5/3}\sqrt[3]{a-ia\tan(e+fx)}\sqrt[3]{a+ia\tan(e+fx)}}+$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(2/3)/(a + I*a*Tan[e + f*x])^(7/3),x]
```

```
[Out] ((I/4)*(d*Sec[e + f*x])^(2/3))/(f*(a + I*a*Tan[e + f*x])^(7/3)) - (5*x*(d*S
ec[e + f*x])^(2/3))/(72*2^(2/3)*a^(5/3)*(a - I*a*Tan[e + f*x])^(1/3)*(a + I
*a*Tan[e + f*x])^(1/3)) + (((5*I)/12)*ArcTan[(a^(1/3) + 2^(2/3)*(a - I*a*Ta
n[e + f*x])^(1/3))/(Sqrt[3]*a^(1/3))]*(d*Sec[e + f*x])^(2/3))/(2^(2/3)*Sqrt
[3]*a^(5/3)*f*(a - I*a*Tan[e + f*x])^(1/3)*(a + I*a*Tan[e + f*x])^(1/3)) -
(((5*I)/72)*Log[Cos[e + f*x]]*(d*Sec[e + f*x])^(2/3))/(2^(2/3)*a^(5/3)*f*(a
 - I*a*Tan[e + f*x])^(1/3)*(a + I*a*Tan[e + f*x])^(1/3)) - (((5*I)/24)*Log[
2^(1/3)*a^(1/3) - (a - I*a*Tan[e + f*x])^(1/3)]*(d*Sec[e + f*x])^(2/3))/(2^
(2/3)*a^(5/3)*f*(a - I*a*Tan[e + f*x])^(1/3)*(a + I*a*Tan[e + f*x])^(1/3))
+ (((5*I)/24)*(d*Sec[e + f*x])^(2/3))/(f*(a + I*a*Tan[e + f*x])^(1/3)*(a^2
+ I*a^2*Tan[e + f*x]))
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 57

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(2/3)), x_Symbol] :> With[
{q = Rt[(b*c - a*d)/b, 3]}, -Simp[Log[RemoveContent[a + b*x, x]]/(2*b*q^2),
 x] + (-Dist[3/(2*b*q), Subst[Int[1/(q^2 + q*x + x^2), x], x, (c + d*x)^(1/
3)], x] - Dist[3/(2*b*q^2), Subst[Int[1/(q - x), x], x, (c + d*x)^(1/3)], x
])] /; FreeQ[{a, b, c, d}, x] && PosQ[(b*c - a*d)/b]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3522

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_) + (d_.)*tan[(e_.) +
(f_.)*(x_)])^(n_.), x_Symbol] :> Dist[a^m*c^m, Int[Sec[e + f*x]^(2*m)*(c +
d*Tan[e + f*x])^(n - m), x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && EqQ[b
*c + a*d, 0] && EqQ[a^2 + b^2, 0] && IntegerQ[m] &&  !(IGtQ[n, 0] && (LtQ[m
, 0] || GtQ[m, n]))
```

Rubi steps

$$\int \frac{(d\sec(e+fx))^{2/3}}{(a+ia\tan(e+fx))^{7/3}}\,dx = \frac{(d\sec(e+fx))^{2/3}\int \frac{\sqrt[3]{a-ia\tan(e+fx)}}{(a+ia\tan(e+fx))^2}\,dx}{\sqrt[3]{a-ia\tan(e+fx)}\,\sqrt[3]{a+ia\tan(e+fx)}}$$

$$= \frac{(d\sec(e+fx))^{2/3}\int \cos^4(e+fx)(a-ia\tan(e+fx))^{7/3}\,dx}{a^4\sqrt[3]{a-ia\tan(e+fx)}\,\sqrt[3]{a+ia\tan(e+fx)}}$$

$$= \frac{\left(ia(d\sec(e+fx))^{2/3}\right)\text{Subst}\left(\int \frac{1}{(a-x)^3(a+x)^{2/3}}\,dx, x, -ia\tan(e+fx)\right)}{f\sqrt[3]{a-ia\tan(e+fx)}\,\sqrt[3]{a+ia\tan(e+fx)}}$$

$$= \frac{i(d\sec(e+fx))^{2/3}}{4f(a+ia\tan(e+fx))^{7/3}} + \frac{\left(5i(d\sec(e+fx))^{2/3}\right)\text{Subst}\left(\int \frac{1}{(a-x)^2(a+x)^{2/3}}\,dx, x, -\right.}{12f\sqrt[3]{a-ia\tan(e+fx)}\,\sqrt[3]{a+ia\tan(e+}$$

$$= \frac{i(d\sec(e+fx))^{2/3}}{4f(a+ia\tan(e+fx))^{7/3}} + \frac{5i(d\sec(e+fx))^{2/3}}{24af(a+ia\tan(e+fx))^{4/3}} + \frac{\left(5i(d\sec(e+fx))^{2/3}\right.}{36af\sqrt[3]{a-}}$$

$$= \frac{i(d\sec(e+fx))^{2/3}}{4f(a+ia\tan(e+fx))^{7/3}} + \frac{5i(d\sec(e+fx))^{2/3}}{24af(a+ia\tan(e+fx))^{4/3}} - \frac{5x(d}{72\,2^{2/3}a^{5/3}\sqrt[3]{a-ia\,\text{ta}}}$$

$$= \frac{i(d\sec(e+fx))^{2/3}}{4f(a+ia\tan(e+fx))^{7/3}} + \frac{5i(d\sec(e+fx))^{2/3}}{24af(a+ia\tan(e+fx))^{4/3}} - \frac{5x(d}{72\,2^{2/3}a^{5/3}\sqrt[3]{a-ia\,\text{ta}}}$$

$$= \frac{i(d\sec(e+fx))^{2/3}}{4f(a+ia\tan(e+fx))^{7/3}} + \frac{5i(d\sec(e+fx))^{2/3}}{24af(a+ia\tan(e+fx))^{4/3}} - \frac{5x(d}{72\,2^{2/3}a^{5/3}\sqrt[3]{a-ia\,\text{ta}}}$$

Mathematica [**A**] time = 1.83, size = 240, normalized size = 0.55

$$\frac{e^{-2i(e+fx)}\sec^2(e+fx)(d\sec(e+fx))^{2/3}\left(-10fxe^{4i(e+fx)}\sqrt[3]{1+e^{2i(e+fx)}}+33ie^{2i(e+fx)}+24ie^{4i(e+fx)}-15ie^{4i(e+fx)}\right.}{144f(a+ia\tan(e+}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(2/3)/(a + I*a*Tan[e + f*x])^(7/3),x]
```

```
[Out] ((9*I + (33*I)*E^((2*I)*(e + f*x)) + (24*I)*E^((4*I)*(e + f*x)) - 10*E^((4*
I)*(e + f*x))*(1 + E^((2*I)*(e + f*x)))^(1/3)*f*x - (10*I)*Sqrt[3]*E^((4*I)
*(e + f*x))*(1 + E^((2*I)*(e + f*x)))^(1/3)*ArcTan[(1 + 2*(1 + E^((2*I)*(e
+ f*x)))^(1/3))/Sqrt[3]] - (15*I)*E^((4*I)*(e + f*x))*(1 + E^((2*I)*(e + f*
x)))^(1/3)*Log[1 - (1 + E^((2*I)*(e + f*x)))^(1/3)])*Sec[e + f*x]^2*(d*Sec[
e + f*x])^(2/3))/(144*E^((2*I)*(e + f*x))*f*(a + I*a*Tan[e + f*x])^(7/3))
```

fricas [**A**] time = 0.96, size = 529, normalized size = 1.21

$$\left(48a^3f\left(\frac{125id^2}{186624a^7f^3}\right)^{\frac{1}{3}}e^{(6ifx+6ie)}\log\left(-\frac{2}{5}\left(72ia^3f\left(\frac{125id^2}{186624a^7f^3}\right)^{\frac{1}{3}}e^{(2ifx+2ie)}-5\cdot 2^{\frac{1}{3}}\left(\frac{a}{e^{(2ifx+2ie)}+1}\right)^{\frac{2}{3}}\left(\frac{d}{e^{(2ifx+2ie)}+1}\right)^{\frac{2}{3}}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2/3)/(a+I*a*tan(f*x+e))^(7/3),x, algorithm="frica
s")
```

```
[Out] 1/48*(48*a^3*f*(125/186624*I*d^2/(a^7*f^3))^(1/3)*e^(6*I*f*x + 6*I*e)*log(-
2/5*(72*I*a^3*f*(125/186624*I*d^2/(a^7*f^3))^(1/3)*e^(2*I*f*x + 2*I*e) - 5*
2^(1/3)*(a/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*(d/(e^(2*I*f*x + 2*I*e) + 1))^(
2/3)*(e^(2*I*f*x + 2*I*e) + 1)*e^(2*I*f*x + 2*I*e))*e^(-2*I*f*x - 2*I*e)) +
 2^(1/3)*(a/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*(d/(e^(2*I*f*x + 2*I*e) + 1))^
(2/3)*(8*I*e^(6*I*f*x + 6*I*e) + 19*I*e^(4*I*f*x + 4*I*e) + 14*I*e^(2*I*f*x
 + 2*I*e) + 3*I)*e^(2*I*f*x + 2*I*e) - 24*(-I*sqrt(3)*a^3*f + a^3*f)*(125/1
86624*I*d^2/(a^7*f^3))^(1/3)*e^(6*I*f*x + 6*I*e)*log(1/5*(10*2^(1/3)*(a/(e^
(2*I*f*x + 2*I*e) + 1))^(2/3)*(d/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*(e^(2*I*f
*x + 2*I*e) + 1)*e^(2*I*f*x + 2*I*e) + (72*sqrt(3)*a^3*f + 72*I*a^3*f)*(125
/186624*I*d^2/(a^7*f^3))^(1/3)*e^(2*I*f*x + 2*I*e))*e^(-2*I*f*x - 2*I*e)) -
 24*(I*sqrt(3)*a^3*f + a^3*f)*(125/186624*I*d^2/(a^7*f^3))^(1/3)*e^(6*I*f*x
 + 6*I*e)*log(1/5*(10*2^(1/3)*(a/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*(d/(e^(2*
I*f*x + 2*I*e) + 1))^(2/3)*(e^(2*I*f*x + 2*I*e) + 1)*e^(2*I*f*x + 2*I*e) -
(72*sqrt(3)*a^3*f - 72*I*a^3*f)*(125/186624*I*d^2/(a^7*f^3))^(1/3)*e^(2*I*f
*x + 2*I*e))*e^(-2*I*f*x - 2*I*e)))*e^(-6*I*f*x - 6*I*e)/(a^3*f)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(fx+e\right)\right)^{\frac{2}{3}}}{\left(ia\tan\left(fx+e\right)+a\right)^{\frac{7}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2/3)/(a+I*a*tan(f*x+e))^(7/3),x, algorithm="giac"
)
```

```
[Out] integrate((d*sec(f*x + e))^(2/3)/(I*a*tan(f*x + e) + a)^(7/3), x)
```

maple [F] time = 0.81, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(fx+e\right)\right)^{\frac{2}{3}}}{\left(a+ia\tan\left(fx+e\right)\right)^{\frac{7}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(2/3)/(a+I*a*tan(f*x+e))^(7/3),x)
```

```
[Out] int((d*sec(f*x+e))^(2/3)/(a+I*a*tan(f*x+e))^(7/3),x)
```

maxima [B] time = 1.75, size = 3905, normalized size = 8.94

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2/3)/(a+I*a*tan(f*x+e))^(7/3),x, algorithm="maxim
a")
```

```
[Out] 1/288*((cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 + sin(1/2*ar
ctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 + 2*cos(1/2*arctan2(sin(4*f*x
+ 4*e), cos(4*f*x + 4*e))) + 1)^(5/6)*(48*(I*2^(1/3)*cos(4*f*x + 4*e) + 2^(
1/3)*sin(4*f*x + 4*e))*cos(5/3*arctan2(sin(1/2*arctan2(sin(4*f*x + 4*e), co
s(4*f*x + 4*e))), cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)
) - (48*2^(1/3)*cos(4*f*x + 4*e) - 48*I*2^(1/3)*sin(4*f*x + 4*e))*sin(5/3*a
rctan2(sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))), cos(1/2*arctan
2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)))*d^(2/3) + (cos(1/2*arctan2(si
n(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 + sin(1/2*arctan2(sin(4*f*x + 4*e), co
s(4*f*x + 4*e)))^2 + 2*cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))
```

```
 + 1)^(1/3)*(30*(-I*2^(1/3)*cos(4*f*x + 4*e) - 2^(1/3)*sin(4*f*x + 4*e))*co
s(2/3*arctan2(sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))), cos(1/2
*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)) + (30*2^(1/3)*cos(4*f*x
 + 4*e) - 30*I*2^(1/3)*sin(4*f*x + 4*e))*sin(2/3*arctan2(sin(1/2*arctan2(si
n(4*f*x + 4*e), cos(4*f*x + 4*e))), cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4
*f*x + 4*e))) + 1)))*d^(2/3) - (10*I*sqrt(3)*2^(1/3)*arctan2(2/3*sqrt(3)*(c
os(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 + sin(1/2*arctan2(sin
(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 + 2*cos(1/2*arctan2(sin(4*f*x + 4*e), c
os(4*f*x + 4*e))) + 1)^(1/6)*cos(1/3*arctan2(sin(1/2*arctan2(sin(4*f*x + 4*
e), cos(4*f*x + 4*e))), cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))
) + 1)) + 1/3*sqrt(3), 1/3*sqrt(3)*(2*(cos(1/2*arctan2(sin(4*f*x + 4*e), co
s(4*f*x + 4*e)))^2 + sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2
 + 2*cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)^(1/6)*sin(1/
3*arctan2(sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))), cos(1/2*arc
tan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)) + sqrt(3))) + 10*I*sqrt(3)*
2^(1/3)*arctan2(2/3*sqrt(3)*(cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x +
4*e)))^2 + sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 + 2*cos(1
/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)^(1/6)*cos(1/3*arctan2(
sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))), cos(1/2*arctan2(sin(4
*f*x + 4*e), cos(4*f*x + 4*e))) + 1)) + 1/3*sqrt(3), -1/3*sqrt(3)*(2*(cos(1
/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 + sin(1/2*arctan2(sin(4*f
*x + 4*e), cos(4*f*x + 4*e)))^2 + 2*cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4
*f*x + 4*e))) + 1)^(1/6)*sin(1/3*arctan2(sin(1/2*arctan2(sin(4*f*x + 4*e),
cos(4*f*x + 4*e))), cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) +
1)) - sqrt(3))) - 5*sqrt(3)*2^(1/3)*log(4/3*(cos(1/2*arctan2(sin(4*f*x + 4*
e), cos(4*f*x + 4*e)))^2 + sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*
e)))^2 + 2*cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)^(1/3)*
(cos(1/3*arctan2(sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))), cos(
1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1))^2 + sin(1/3*arctan2(
sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))), cos(1/2*arctan2(sin(4
*f*x + 4*e), cos(4*f*x + 4*e))) + 1))^2) + 4/3*(cos(1/2*arctan2(sin(4*f*x +
 4*e), cos(4*f*x + 4*e)))^2 + sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x +
 4*e)))^2 + 2*cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)^(1/
6)*(sqrt(3)*sin(1/3*arctan2(sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4
*e))), cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)) + cos(1/3
*arctan2(sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))), cos(1/2*arct
an2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1))) + 4/3) + 5*sqrt(3)*2^(1/3)*
log(4/3*(cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 + sin(1/2*a
rctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 + 2*cos(1/2*arctan2(sin(4*f*x
 + 4*e), cos(4*f*x + 4*e))) + 1)^(1/3)*(cos(1/3*arctan2(sin(1/2*arctan2(sin
(4*f*x + 4*e), cos(4*f*x + 4*e))), cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*
f*x + 4*e))) + 1))^2 + sin(1/3*arctan2(sin(1/2*arctan2(sin(4*f*x + 4*e), co
s(4*f*x + 4*e))), cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)
)^2) - 4/3*(cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 + sin(1/
2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 + 2*cos(1/2*arctan2(sin(4*
f*x + 4*e), cos(4*f*x + 4*e))) + 1)^(1/6)*(sqrt(3)*sin(1/3*arctan2(sin(1/2*
arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))), cos(1/2*arctan2(sin(4*f*x + 4
*e), cos(4*f*x + 4*e))) + 1)) - cos(1/3*arctan2(sin(1/2*arctan2(sin(4*f*x +
 4*e), cos(4*f*x + 4*e))), cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*
e))) + 1))) + 4/3) + 10*2^(1/3)*arctan2((cos(1/2*arctan2(sin(4*f*x + 4*e),
cos(4*f*x + 4*e)))^2 + sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))
^2 + 2*cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)^(1/3)*sin(
2/3*arctan2(sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))), cos(1/2*a
rctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)) + (cos(1/2*arctan2(sin(4*
f*x + 4*e), cos(4*f*x + 4*e)))^2 + sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*
f*x + 4*e)))^2 + 2*cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1
)^(1/6)*sin(1/3*arctan2(sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))
), cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)), (cos(1/2*arc
tan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 + sin(1/2*arctan2(sin(4*f*x + 4
```

```
*e), cos(4*f*x + 4*e)))^2 + 2*cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x +
 4*e))) + 1)^(1/3)*cos(2/3*arctan2(sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*
f*x + 4*e))), cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)) +
(cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 + sin(1/2*arctan2(s
in(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 + 2*cos(1/2*arctan2(sin(4*f*x + 4*e),
 cos(4*f*x + 4*e))) + 1)^(1/6)*cos(1/3*arctan2(sin(1/2*arctan2(sin(4*f*x +
4*e), cos(4*f*x + 4*e))), cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e
))) + 1)) + 1) - 20*2^(1/3)*arctan2((cos(1/2*arctan2(sin(4*f*x + 4*e), cos(
4*f*x + 4*e)))^2 + sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 +
 2*cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)^(1/6)*sin(1/3*
arctan2(sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))), cos(1/2*arcta
n2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)), (cos(1/2*arctan2(sin(4*f*x +
 4*e), cos(4*f*x + 4*e)))^2 + sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x +
 4*e)))^2 + 2*cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)^(1/
6)*cos(1/3*arctan2(sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))), co
s(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)) - 1) + 10*I*2^(1/3
)*log((cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 + sin(1/2*arc
tan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 + 2*cos(1/2*arctan2(sin(4*f*x +
 4*e), cos(4*f*x + 4*e))) + 1)^(1/3)*cos(1/3*arctan2(sin(1/2*arctan2(sin(4*
f*x + 4*e), cos(4*f*x + 4*e))), cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x
 + 4*e))) + 1))^2 + (cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2
 + sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 + 2*cos(1/2*arcta
n2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)^(1/3)*sin(1/3*arctan2(sin(1/2*
arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))), cos(1/2*arctan2(sin(4*f*x + 4
*e), cos(4*f*x + 4*e))) + 1))^2 - 2*(cos(1/2*arctan2(sin(4*f*x + 4*e), cos(
4*f*x + 4*e)))^2 + sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 +
 2*cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)^(1/6)*cos(1/3*
arctan2(sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))), cos(1/2*arcta
n2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)) + 1) - 5*I*2^(1/3)*log((cos(1
/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 + sin(1/2*arctan2(sin(4*f
*x + 4*e), cos(4*f*x + 4*e)))^2 + 2*cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4
*f*x + 4*e))) + 1)^(2/3)*(cos(2/3*arctan2(sin(1/2*arctan2(sin(4*f*x + 4*e),
 cos(4*f*x + 4*e))), cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) +
 1))^2 + sin(2/3*arctan2(sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)
)), cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1))^2) + (cos(1/
2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 + sin(1/2*arctan2(sin(4*f*
x + 4*e), cos(4*f*x + 4*e)))^2 + 2*cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*
f*x + 4*e))) + 1)^(1/3)*(cos(1/3*arctan2(sin(1/2*arctan2(sin(4*f*x + 4*e),
cos(4*f*x + 4*e))), cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) +
1))^2 + sin(1/3*arctan2(sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))
), cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1))^2) + 2*(cos(1
/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 + sin(1/2*arctan2(sin(4*f
*x + 4*e), cos(4*f*x + 4*e)))^2 + 2*cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4
*f*x + 4*e))) + 1)^(1/3)*((cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*
e)))^2 + sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2 + 2*cos(1/2
*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)^(1/6)*(cos(2/3*arctan2(s
in(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))), cos(1/2*arctan2(sin(4*
f*x + 4*e), cos(4*f*x + 4*e))) + 1))*cos(1/3*arctan2(sin(1/2*arctan2(sin(4*
f*x + 4*e), cos(4*f*x + 4*e))), cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x
 + 4*e))) + 1)) + sin(2/3*arctan2(sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f
*x + 4*e))), cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1))*sin
(1/3*arctan2(sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))), cos(1/2*
arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1))) + cos(2/3*arctan2(sin(1
/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))), cos(1/2*arctan2(sin(4*f*x
+ 4*e), cos(4*f*x + 4*e))) + 1))) + 2*(cos(1/2*arctan2(sin(4*f*x + 4*e), co
s(4*f*x + 4*e)))^2 + sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e)))^2
 + 2*cos(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)^(1/6)*cos(1/
3*arctan2(sin(1/2*arctan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))), cos(1/2*arc
tan2(sin(4*f*x + 4*e), cos(4*f*x + 4*e))) + 1)) + 1))*d^(2/3))/(a^(7/3)*f)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{2/3}}{\left(a+a\tan\left(e+f\,x\right)\,1\mathrm{i}\right)^{7/3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(2/3)/(a + a*tan(e + f*x)*1i)^(7/3),x)
[Out] int((d/cos(e + f*x))^(2/3)/(a + a*tan(e + f*x)*1i)^(7/3), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(2/3)/(a+I*a*tan(f*x+e))**(7/3),x)
[Out] Timed out
```

3.444 $\int \frac{(d \sec(e+fx))^{2/3}}{(a+ia\tan(e+fx))^{4/3}}\,dx$

Optimal. Leaf size=378

$$\frac{i\tan^{-1}\left(\frac{\sqrt[3]{a}+2^{2/3}\sqrt[3]{a-ia\tan(e+fx)}}{\sqrt{3}\sqrt[3]{a}}\right)(d\sec(e+fx))^{2/3}}{2^{2/3}\sqrt{3}\,a^{2/3}f\sqrt[3]{a-ia\tan(e+fx)}\sqrt[3]{a+ia\tan(e+fx)}}-\frac{x(d\sec(e+fx))^{2/3}}{6\,2^{2/3}a^{2/3}\sqrt[3]{a-ia\tan(e+fx)}\sqrt[3]{a+ia\tan(e+fx)}}-\frac{i(d\sec}{2\,2^{2/}}$$

```
[Out] 1/2*I*(d*sec(f*x+e))^(2/3)/f/(a+I*a*tan(f*x+e))^(4/3)-1/12*x*(d*sec(f*x+e))
^(2/3)*2^(1/3)/a^(2/3)/(a-I*a*tan(f*x+e))^(1/3)/(a+I*a*tan(f*x+e))^(1/3)-1/
12*I*ln(cos(f*x+e))*(d*sec(f*x+e))^(2/3)*2^(1/3)/a^(2/3)/f/(a-I*a*tan(f*x+e
))^(1/3)/(a+I*a*tan(f*x+e))^(1/3)-1/4*I*ln(2^(1/3)*a^(1/3)-(a-I*a*tan(f*x+e
))^(1/3))*(d*sec(f*x+e))^(2/3)*2^(1/3)/a^(2/3)/f/(a-I*a*tan(f*x+e))^(1/3)/(
a+I*a*tan(f*x+e))^(1/3)+1/6*I*arctan(1/3*(a^(1/3)+2^(2/3)*(a-I*a*tan(f*x+e)
)^(1/3))/a^(1/3)*3^(1/2))*(d*sec(f*x+e))^(2/3)*2^(1/3)/a^(2/3)/f*3^(1/2)/(a
-I*a*tan(f*x+e))^(1/3)/(a+I*a*tan(f*x+e))^(1/3)
```

Rubi [A] time = 0.34, antiderivative size = 378, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.267, Rules used = {3505, 3522, 3487, 51, 57, 617, 204, 31}

$$\frac{i\tan^{-1}\left(\frac{\sqrt[3]{a}+2^{2/3}\sqrt[3]{a-ia\tan(e+fx)}}{\sqrt{3}\sqrt[3]{a}}\right)(d\sec(e+fx))^{2/3}}{2^{2/3}\sqrt{3}\,a^{2/3}f\sqrt[3]{a-ia\tan(e+fx)}\sqrt[3]{a+ia\tan(e+fx)}}-\frac{x(d\sec(e+fx))^{2/3}}{6\,2^{2/3}a^{2/3}\sqrt[3]{a-ia\tan(e+fx)}\sqrt[3]{a+ia\tan(e+fx)}}-\frac{i(d\sec}{2\,2^{2/}}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(2/3)/(a + I*a*Tan[e + f*x])^(4/3),x]
```

```
[Out] ((I/2)*(d*Sec[e + f*x])^(2/3))/(f*(a + I*a*Tan[e + f*x])^(4/3)) - (x*(d*Sec
[e + f*x])^(2/3))/(6*2^(2/3)*a^(2/3)*(a - I*a*Tan[e + f*x])^(1/3)*(a + I*a*
Tan[e + f*x])^(1/3)) + (I*ArcTan[(a^(1/3) + 2^(2/3)*(a - I*a*Tan[e + f*x])^
(1/3))/(Sqrt[3]*a^(1/3))]*(d*Sec[e + f*x])^(2/3))/(2^(2/3)*Sqrt[3]*a^(2/3)*
f*(a - I*a*Tan[e + f*x])^(1/3)*(a + I*a*Tan[e + f*x])^(1/3)) - ((I/6)*Log[C
os[e + f*x]]*(d*Sec[e + f*x])^(2/3))/(2^(2/3)*a^(2/3)*f*(a - I*a*Tan[e + f*
x])^(1/3)*(a + I*a*Tan[e + f*x])^(1/3)) - ((I/2)*Log[2^(1/3)*a^(1/3) - (a -
 I*a*Tan[e + f*x])^(1/3)]*(d*Sec[e + f*x])^(2/3))/(2^(2/3)*a^(2/3)*f*(a - I
*a*Tan[e + f*x])^(1/3)*(a + I*a*Tan[e + f*x])^(1/3))
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 57

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(2/3)), x_Symbol] :> With[
{q = Rt[(b*c - a*d)/b, 3]}, -Simp[Log[RemoveContent[a + b*x, x]]/(2*b*q^2),
 x] + (-Dist[3/(2*b*q), Subst[Int[1/(q^2 + q*x + x^2), x], x, (c + d*x)^(1/
3)], x] - Dist[3/(2*b*q^2), Subst[Int[1/(q - x), x], x, (c + d*x)^(1/3)], x
```

```
])] /; FreeQ[{a, b, c, d}, x] && PosQ[(b*c - a*d)/b]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3522

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_) + (d_.)*tan[(e_.) +
(f_.)*(x_)])^(n_.), x_Symbol] :> Dist[a^m*c^m, Int[Sec[e + f*x]^(2*m)*(c +
d*Tan[e + f*x])^(n - m), x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && EqQ[b
*c + a*d, 0] && EqQ[a^2 + b^2, 0] && IntegerQ[m] &&  !(IGtQ[n, 0] && (LtQ[m
, 0] || GtQ[m, n]))
```

Rubi steps

$$\int \frac{(d\sec(e+fx))^{2/3}}{(a+ia\tan(e+fx))^{4/3}}dx = \frac{(d\sec(e+fx))^{2/3}\int \frac{\sqrt[3]{a-ia\tan(e+fx)}}{a+ia\tan(e+fx)}dx}{\sqrt[3]{a-ia\tan(e+fx)}\sqrt[3]{a+ia\tan(e+fx)}}$$

$$= \frac{(d\sec(e+fx))^{2/3}\int \cos^2(e+fx)(a-ia\tan(e+fx))^{4/3}dx}{a^2\sqrt[3]{a-ia\tan(e+fx)}\sqrt[3]{a+ia\tan(e+fx)}}$$

$$= \frac{\left(ia(d\sec(e+fx))^{2/3}\right)\text{Subst}\left(\int \frac{1}{(a-x)^2(a+x)^{2/3}}dx, x, -ia\tan(e+fx)\right)}{f\sqrt[3]{a-ia\tan(e+fx)}\sqrt[3]{a+ia\tan(e+fx)}}$$

$$= \frac{i(d\sec(e+fx))^{2/3}}{2f(a+ia\tan(e+fx))^{4/3}} + \frac{\left(i(d\sec(e+fx))^{2/3}\right)\text{Subst}\left(\int \frac{1}{(a-x)(a+x)^{2/3}}dx, x, -ia\tan\right.}{3f\sqrt[3]{a-ia\tan(e+fx)}\sqrt[3]{a+ia\tan(e+fx)}}$$

$$= \frac{i(d\sec(e+fx))^{2/3}}{2f(a+ia\tan(e+fx))^{4/3}} - \frac{x(d\sec(e+fx))^{2/3}}{6\,2^{2/3}a^{2/3}\sqrt[3]{a-ia\tan(e+fx)}\sqrt[3]{a+ia\tan(e+fx)}} -$$

$$= \frac{i(d\sec(e+fx))^{2/3}}{2f(a+ia\tan(e+fx))^{4/3}} - \frac{x(d\sec(e+fx))^{2/3}}{6\,2^{2/3}a^{2/3}\sqrt[3]{a-ia\tan(e+fx)}\sqrt[3]{a+ia\tan(e+fx)}} -$$

$$= \frac{i(d\sec(e+fx))^{2/3}}{2f(a+ia\tan(e+fx))^{4/3}} - \frac{x(d\sec(e+fx))^{2/3}}{6\,2^{2/3}a^{2/3}\sqrt[3]{a-ia\tan(e+fx)}\sqrt[3]{a+ia\tan(e+fx)}} +$$

Mathematica [A] time = 1.32, size = 220, normalized size = 0.58

$$\frac{e^{-i(e+fx)}(d\sec(e+fx))^{5/3}\left(-2fxe^{2i(e+fx)}\sqrt[3]{1+e^{2i(e+fx)}} + 3ie^{2i(e+fx)} - 3ie^{2i(e+fx)}\sqrt[3]{1+e^{2i(e+fx)}}\log\left(1-\sqrt[3]{1+e^{2i(e+f}}\right.\right.}{12df(a+ia\tan(e+fx))^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(2/3)/(a + I*a*Tan[e + f*x])^(4/3),x]
```

```
[Out] ((3*I + (3*I)*E^((2*I)*(e + f*x)) - 2*E^((2*I)*(e + f*x))*(1 + E^((2*I)*(e
+ f*x)))^(1/3)*f*x - (2*I)*Sqrt[3]*E^((2*I)*(e + f*x))*(1 + E^((2*I)*(e + f
*x)))^(1/3)*ArcTan[(1 + 2*(1 + E^((2*I)*(e + f*x)))^(1/3))/Sqrt[3]] - (3*I)
*E^((2*I)*(e + f*x))*(1 + E^((2*I)*(e + f*x)))^(1/3)*Log[1 - (1 + E^((2*I)*
(e + f*x)))^(1/3)])*(d*Sec[e + f*x])^(5/3))/(12*d*E^(I*(e + f*x))*f*(a + I*
a*Tan[e + f*x])^(4/3))
```

fricas [A] time = 0.63, size = 515, normalized size = 1.36

$$\left(4a^2f\left(\frac{id^2}{108a^4f^3}\right)^{\frac{1}{3}}e^{(4ifx+4ie)}\log\left(\left(\left(-12ia^2f\left(\frac{id^2}{108a^4f^3}\right)^{\frac{1}{3}}e^{(2ifx+2ie)} + 2\cdot 2^{\frac{1}{3}}\left(\frac{a}{e^{(2ifx+2ie)}+1}\right)^{\frac{2}{3}}\left(\frac{d}{e^{(2ifx+2ie)}+1}\right)^{\frac{2}{3}}\left(e^{(2ifx+2ie)}\right.\right.\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2/3)/(a+I*a*tan(f*x+e))^(4/3),x, algorithm="frica
s")
```

```
[Out] 1/4*(4*a^2*f*(1/108*I*d^2/(a^4*f^3))^(1/3)*e^(4*I*f*x + 4*I*e)*log((-12*I*a
^2*f*(1/108*I*d^2/(a^4*f^3))^(1/3)*e^(2*I*f*x + 2*I*e) + 2*2^(1/3)*(a/(e^(2
```

```
*I*f*x + 2*I*e) + 1))^(2/3)*(d/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*(e^(2*I*f*x
 + 2*I*e) + 1)*e^(2*I*f*x + 2*I*e))*e^(-2*I*f*x - 2*I*e)) + 2^(1/3)*(a/(e^(
2*I*f*x + 2*I*e) + 1))^(2/3)*(d/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*(I*e^(4*I*
f*x + 4*I*e) + 2*I*e^(2*I*f*x + 2*I*e) + I)*e^(2*I*f*x + 2*I*e) - 2*(-I*sqr
t(3)*a^2*f + a^2*f)*(1/108*I*d^2/(a^4*f^3))^(1/3)*e^(4*I*f*x + 4*I*e)*log((
2*2^(1/3)*(a/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*(d/(e^(2*I*f*x + 2*I*e) + 1))
^(2/3)*(e^(2*I*f*x + 2*I*e) + 1)*e^(2*I*f*x + 2*I*e) + (6*sqrt(3)*a^2*f + 6
*I*a^2*f)*(1/108*I*d^2/(a^4*f^3))^(1/3)*e^(2*I*f*x + 2*I*e))*e^(-2*I*f*x -
2*I*e)) - 2*(I*sqrt(3)*a^2*f + a^2*f)*(1/108*I*d^2/(a^4*f^3))^(1/3)*e^(4*I*
f*x + 4*I*e)*log((2*2^(1/3)*(a/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*(d/(e^(2*I*
f*x + 2*I*e) + 1))^(2/3)*(e^(2*I*f*x + 2*I*e) + 1)*e^(2*I*f*x + 2*I*e) - (6
*sqrt(3)*a^2*f - 6*I*a^2*f)*(1/108*I*d^2/(a^4*f^3))^(1/3)*e^(2*I*f*x + 2*I*
e))*e^(-2*I*f*x - 2*I*e)))*e^(-4*I*f*x - 4*I*e)/(a^2*f)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(fx+e\right)\right)^{\frac{2}{3}}}{\left(i\,a\tan\left(fx+e\right)+a\right)^{\frac{4}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2/3)/(a+I*a*tan(f*x+e))^(4/3),x, algorithm="giac"
)
```

```
[Out] integrate((d*sec(f*x + e))^(2/3)/(I*a*tan(f*x + e) + a)^(4/3), x)
```

maple [F] time = 0.78, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(fx+e\right)\right)^{\frac{2}{3}}}{\left(a+ia\tan\left(fx+e\right)\right)^{\frac{4}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(2/3)/(a+I*a*tan(f*x+e))^(4/3),x)
```

```
[Out] int((d*sec(f*x+e))^(2/3)/(a+I*a*tan(f*x+e))^(4/3),x)
```

maxima [B] time = 0.95, size = 1907, normalized size = 5.04

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2/3)/(a+I*a*tan(f*x+e))^(4/3),x, algorithm="maxim
a")
```

```
[Out] -1/24*((cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(
1/3)*(6*(-I*2^(1/3)*cos(2*f*x + 2*e) - 2^(1/3)*sin(2*f*x + 2*e))*cos(2/3*ar
ctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) + (6*2^(1/3)*cos(2*f*x + 2*e
) - 6*I*2^(1/3)*sin(2*f*x + 2*e))*sin(2/3*arctan2(sin(2*f*x + 2*e), cos(2*f
*x + 2*e) + 1)))*d^(2/3) - (-2*I*sqrt(3)*2^(1/3)*arctan2(2/3*sqrt(3)*(cos(2
*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/6)*cos(1/3*
arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) + 1/3*sqrt(3), 1/3*sqrt(3)
*(2*(cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/6
)*sin(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) + sqrt(3))) - 2*
I*sqrt(3)*2^(1/3)*arctan2(2/3*sqrt(3)*(cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e
)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/6)*cos(1/3*arctan2(sin(2*f*x + 2*e), cos(2
*f*x + 2*e) + 1)) + 1/3*sqrt(3), -1/3*sqrt(3)*(2*(cos(2*f*x + 2*e)^2 + sin(
2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/6)*sin(1/3*arctan2(sin(2*f*x +
```

```
2*e), cos(2*f*x + 2*e) + 1)) - sqrt(3))) + sqrt(3)*2^(1/3)*log(4/3*(cos(2*f
*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/3)*(cos(1/3*a
rctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1))^2 + sin(1/3*arctan2(sin(2*f
*x + 2*e), cos(2*f*x + 2*e) + 1))^2) + 4/3*(cos(2*f*x + 2*e)^2 + sin(2*f*x
+ 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/6)*(sqrt(3)*sin(1/3*arctan2(sin(2*f*x
 + 2*e), cos(2*f*x + 2*e) + 1)) + cos(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f
*x + 2*e) + 1))) + 4/3) - sqrt(3)*2^(1/3)*log(4/3*(cos(2*f*x + 2*e)^2 + sin
(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/3)*(cos(1/3*arctan2(sin(2*f*x
+ 2*e), cos(2*f*x + 2*e) + 1))^2 + sin(1/3*arctan2(sin(2*f*x + 2*e), cos(2*
f*x + 2*e) + 1))^2) - 4/3*(cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(
2*f*x + 2*e) + 1)^(1/6)*(sqrt(3)*sin(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*
x + 2*e) + 1)) - cos(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)))
+ 4/3) - 2*2^(1/3)*arctan2((cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos
(2*f*x + 2*e) + 1)^(1/3)*sin(2/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e)
 + 1)) + (cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)
^(1/6)*sin(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)), (cos(2*f*x
 + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/3)*cos(2/3*arct
an2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) + (cos(2*f*x + 2*e)^2 + sin(2*
f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/6)*cos(1/3*arctan2(sin(2*f*x + 2*
e), cos(2*f*x + 2*e) + 1)) + 1) + 4*2^(1/3)*arctan2((cos(2*f*x + 2*e)^2 + s
in(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/6)*sin(1/3*arctan2(sin(2*f*x
 + 2*e), cos(2*f*x + 2*e) + 1)), (cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 +
 2*cos(2*f*x + 2*e) + 1)^(1/6)*cos(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x
+ 2*e) + 1)) - 1) - 2*I*2^(1/3)*log((cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^
2 + 2*cos(2*f*x + 2*e) + 1)^(1/3)*cos(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f
*x + 2*e) + 1))^2 + (cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x
+ 2*e) + 1)^(1/3)*sin(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1))^
2 - 2*(cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1
/6)*cos(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) + 1) + I*2^(1/
3)*log((cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(
2/3)*(cos(2/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1))^2 + sin(2/3*
arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1))^2) + (cos(2*f*x + 2*e)^2 +
 sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/3)*(cos(1/3*arctan2(sin(2*
f*x + 2*e), cos(2*f*x + 2*e) + 1))^2 + sin(1/3*arctan2(sin(2*f*x + 2*e), co
s(2*f*x + 2*e) + 1))^2) + 2*(cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*co
s(2*f*x + 2*e) + 1)^(1/3)*((cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos
(2*f*x + 2*e) + 1)^(1/6)*(cos(2/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e
) + 1))*cos(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) + sin(2/3*
arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1))*sin(1/3*arctan2(sin(2*f*x
+ 2*e), cos(2*f*x + 2*e) + 1))) + cos(2/3*arctan2(sin(2*f*x + 2*e), cos(2*f
*x + 2*e) + 1))) + 2*(cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x
 + 2*e) + 1)^(1/6)*cos(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1))
 + 1))*d^(2/3))/(a^(4/3)*f)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{2/3}}{{\left(a+a\,\tan\left(e+f\,x\right)\,1{}\mathrm{i}\right)}^{4/3}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(2/3)/(a + a*tan(e + f*x)*1i)^(4/3),x)
```

```
[Out] int((d/cos(e + f*x))^(2/3)/(a + a*tan(e + f*x)*1i)^(4/3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(e+fx\right)\right)^{\frac{2}{3}}}{\left(ia\left(\tan\left(e+fx\right)-i\right)\right)^{\frac{4}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(2/3)/(a+I*a*tan(f*x+e))**(4/3),x)
```

```
[Out] Integral((d*sec(e + f*x))**(2/3)/(I*a*(tan(e + f*x) - I))**(4/3), x)
```

3.445 $\int \frac{(d\sec(e+fx))^{2/3}}{\sqrt[3]{a+ia\tan(e+fx)}}\,dx$

Optimal. Leaf size=340

$$\frac{i\sqrt{3}\sqrt[3]{a}\tan^{-1}\left(\frac{\sqrt[3]{a}+2^{2/3}\sqrt[3]{a-ia\tan(e+fx)}}{\sqrt{3}\sqrt[3]{a}}\right)(d\sec(e+fx))^{2/3}}{2^{2/3}f\sqrt[3]{a-ia\tan(e+fx)}\sqrt[3]{a+ia\tan(e+fx)}}-\frac{\sqrt[3]{a}x(d\sec(e+fx))^{2/3}}{2\,2^{2/3}\sqrt[3]{a-ia\tan(e+fx)}\sqrt[3]{a+ia\tan(e+fx)}}-\frac{3i\sqrt[3]{a}(d}{2}$$

```
[Out] -1/4*a^(1/3)*x*(d*sec(f*x+e))^(2/3)*2^(1/3)/(a-I*a*tan(f*x+e))^(1/3)/(a+I*a
*tan(f*x+e))^(1/3)-1/4*I*a^(1/3)*ln(cos(f*x+e))*(d*sec(f*x+e))^(2/3)*2^(1/3
)/f/(a-I*a*tan(f*x+e))^(1/3)/(a+I*a*tan(f*x+e))^(1/3)-3/4*I*a^(1/3)*ln(2^(1
/3)*a^(1/3)-(a-I*a*tan(f*x+e))^(1/3))*(d*sec(f*x+e))^(2/3)*2^(1/3)/f/(a-I*a
*tan(f*x+e))^(1/3)/(a+I*a*tan(f*x+e))^(1/3)+1/2*I*a^(1/3)*arctan(1/3*(a^(1/
3)+2^(2/3)*(a-I*a*tan(f*x+e))^(1/3))/a^(1/3)*3^(1/2))*(d*sec(f*x+e))^(2/3)*
3^(1/2)*2^(1/3)/f/(a-I*a*tan(f*x+e))^(1/3)/(a+I*a*tan(f*x+e))^(1/3)
```

Rubi [A] time = 0.17, antiderivative size = 340, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {3492, 3481, 57, 617, 204, 31}

$$\frac{i\sqrt{3}\sqrt[3]{a}\tan^{-1}\left(\frac{\sqrt[3]{a}+2^{2/3}\sqrt[3]{a-ia\tan(e+fx)}}{\sqrt{3}\sqrt[3]{a}}\right)(d\sec(e+fx))^{2/3}}{2^{2/3}f\sqrt[3]{a-ia\tan(e+fx)}\sqrt[3]{a+ia\tan(e+fx)}}-\frac{\sqrt[3]{a}x(d\sec(e+fx))^{2/3}}{2\,2^{2/3}\sqrt[3]{a-ia\tan(e+fx)}\sqrt[3]{a+ia\tan(e+fx)}}-\frac{3i\sqrt[3]{a}(d}{2}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(2/3)/(a + I*a*Tan[e + f*x])^(1/3),x]
```

```
[Out] -(a^(1/3)*x*(d*Sec[e + f*x])^(2/3))/(2*2^(2/3)*(a - I*a*Tan[e + f*x])^(1/3)
*(a + I*a*Tan[e + f*x])^(1/3)) + (I*Sqrt[3]*a^(1/3)*ArcTan[(a^(1/3) + 2^(2/
3)*(a - I*a*Tan[e + f*x])^(1/3))/(Sqrt[3]*a^(1/3))]*(d*Sec[e + f*x])^(2/3))
/(2^(2/3)*f*(a - I*a*Tan[e + f*x])^(1/3)*(a + I*a*Tan[e + f*x])^(1/3)) - ((
I/2)*a^(1/3)*Log[Cos[e + f*x]]*(d*Sec[e + f*x])^(2/3))/(2^(2/3)*f*(a - I*a*
Tan[e + f*x])^(1/3)*(a + I*a*Tan[e + f*x])^(1/3)) - (((3*I)/2)*a^(1/3)*Log[
2^(1/3)*a^(1/3) - (a - I*a*Tan[e + f*x])^(1/3)]*(d*Sec[e + f*x])^(2/3))/(2^
(2/3)*f*(a - I*a*Tan[e + f*x])^(1/3)*(a + I*a*Tan[e + f*x])^(1/3))
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 57

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(2/3)), x_Symbol] :> With[
{q = Rt[(b*c - a*d)/b, 3]}, -Simp[Log[RemoveContent[a + b*x, x]]/(2*b*q^2),
 x] + (-Dist[3/(2*b*q), Subst[Int[1/(q^2 + q*x + x^2), x], x, (c + d*x)^(1/
3)], x] - Dist[3/(2*b*q^2), Subst[Int[1/(q - x), x], x, (c + d*x)^(1/3)], x
])] /; FreeQ[{a, b, c, d}, x] && PosQ[(b*c - a*d)/b]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 3481

```
Int[((a_) + (b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> -Dist[b/d, Su
bst[Int[(a + x)^(n - 1)/(a - x), x], x, b*Tan[c + d*x]], x] /; FreeQ[{a, b,
 c, d, n}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3492

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Dist[((a/d)^(2*IntPart[n])*(a + b*Tan[e + f*x])^Fra
cPart[n]*(a - b*Tan[e + f*x])^FracPart[n])/(d*Sec[e + f*x])^(2*FracPart[n])
, Int[1/(a - b*Tan[e + f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] &
& EqQ[a^2 + b^2, 0] && EqQ[Simplify[m/2 + n], 0]
```

Rubi steps

$$\int \frac{(d\sec(e+fx))^{2/3}}{\sqrt[3]{a+ia\tan(e+fx)}}\,dx = \frac{(d\sec(e+fx))^{2/3}\int \sqrt[3]{a-ia\tan(e+fx)}\,dx}{\sqrt[3]{a-ia\tan(e+fx)}\,\sqrt[3]{a+ia\tan(e+fx)}}$$

$$= \frac{\left(ia(d\sec(e+fx))^{2/3}\right)\text{Subst}\left(\int \frac{1}{(a-x)(a+x)^{2/3}}\,dx, x, -ia\tan(e+fx)\right)}{f\sqrt[3]{a-ia\tan(e+fx)}\,\sqrt[3]{a+ia\tan(e+fx)}}$$

$$= -\frac{\sqrt[3]{a}\,x(d\sec(e+fx))^{2/3}}{2\,2^{2/3}\sqrt[3]{a-ia\tan(e+fx)}\,\sqrt[3]{a+ia\tan(e+fx)}} - \frac{i\sqrt[3]{a}\,\log(\cos(e+fx))(d\,\mathrm{s}}{2\,2^{2/3}f\sqrt[3]{a-ia\tan(e+fx)}\,\sqrt[3]{\ }}$$

$$= -\frac{\sqrt[3]{a}\,x(d\sec(e+fx))^{2/3}}{2\,2^{2/3}\sqrt[3]{a-ia\tan(e+fx)}\,\sqrt[3]{a+ia\tan(e+fx)}} - \frac{i\sqrt[3]{a}\,\log(\cos(e+fx))(d\,\mathrm{s}}{2\,2^{2/3}f\sqrt[3]{a-ia\tan(e+fx)}\,\sqrt[3]{\ }}$$

$$= -\frac{\sqrt[3]{a}\,x(d\sec(e+fx))^{2/3}}{2\,2^{2/3}\sqrt[3]{a-ia\tan(e+fx)}\,\sqrt[3]{a+ia\tan(e+fx)}} + \frac{i\sqrt{3}\sqrt[3]{a}\,\tan^{-1}\left(\frac{1+\frac{2^{2/3}\sqrt[3]{a-ia\tan(e+}}{\sqrt[3]{a}}}{\sqrt{3}}\right.}{2^{2/3}f\sqrt[3]{a-ia\tan(e+fx)}\,\sqrt[3]{\ }}$$

Mathematica [A] time = 0.67, size = 161, normalized size = 0.47

$$-\frac{\sqrt[3]{1+e^{2i(e+fx)}}\left(\frac{de^{i(e+fx)}}{1+e^{2i(e+fx)}}\right)^{2/3}\left(3i\log\left(1-\sqrt[3]{1+e^{2i(e+fx)}}\right)+2i\sqrt{3}\tan^{-1}\left(\frac{1+2\sqrt[3]{1+e^{2i(e+fx)}}}{\sqrt{3}}\right)+2fx\right)}{2\,2^{2/3}f\sqrt[3]{\frac{ae^{2i(e+fx)}}{1+e^{2i(e+fx)}}}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(2/3)/(a + I*a*Tan[e + f*x])^(1/3),x]
```

```
[Out] -1/2*(((d*E^(I*(e + f*x)))/(1 + E^((2*I)*(e + f*x))))^(2/3)*(1 + E^((2*I)*(
e + f*x)))^(1/3)*(2*f*x + (2*I)*Sqrt[3]*ArcTan[(1 + 2*(1 + E^((2*I)*(e + f*
x)))^(1/3))/Sqrt[3]] + (3*I)*Log[1 - (1 + E^((2*I)*(e + f*x)))^(1/3)]))/(2^
(2/3)*((a*E^((2*I)*(e + f*x)))/(1 + E^((2*I)*(e + f*x))))^(1/3)*f)
```

fricas [A] time = 1.68, size = 369, normalized size = 1.09

$$\frac{1}{2}\left(i\sqrt{3}-1\right)\left(\frac{id^2}{4af^3}\right)^{\frac{1}{3}}\log\left(\left(\left(2\cdot 2^{\frac{1}{3}}\left(\frac{a}{e^{(2ifx+2ie)}+1}\right)^{\frac{2}{3}}\left(\frac{d}{e^{(2ifx+2ie)}+1}\right)^{\frac{2}{3}}\left(e^{(2ifx+2ie)}+1\right)e^{(2ifx+2ie)}+\left(2\sqrt{3}af+2i\right.\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2/3)/(a+I*a*tan(f*x+e))^(1/3),x, algorithm="frica
s")
```

```
[Out] 1/2*(I*sqrt(3) - 1)*(1/4*I*d^2/(a*f^3))^(1/3)*log((2*2^(1/3)*(a/(e^(2*I*f*x
 + 2*I*e) + 1))^(2/3)*(d/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*(e^(2*I*f*x + 2*I
*e) + 1)*e^(2*I*f*x + 2*I*e) + (2*sqrt(3)*a*f + 2*I*a*f)*(1/4*I*d^2/(a*f^3)
)^(1/3)*e^(2*I*f*x + 2*I*e))*e^(-2*I*f*x - 2*I*e)) + 1/2*(-I*sqrt(3) - 1)*(
1/4*I*d^2/(a*f^3))^(1/3)*log((2*2^(1/3)*(a/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)
*(d/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*(e^(2*I*f*x + 2*I*e) + 1)*e^(2*I*f*x +
 2*I*e) - (2*sqrt(3)*a*f - 2*I*a*f)*(1/4*I*d^2/(a*f^3))^(1/3)*e^(2*I*f*x +
2*I*e))*e^(-2*I*f*x - 2*I*e)) + (1/4*I*d^2/(a*f^3))^(1/3)*log((2*2^(1/3)*(a
/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*(d/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*(e^(2
*I*f*x + 2*I*e) + 1)*e^(2*I*f*x + 2*I*e) - 4*I*a*f*(1/4*I*d^2/(a*f^3))^(1/3
)*e^(2*I*f*x + 2*I*e))*e^(-2*I*f*x - 2*I*e))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(fx+e\right)\right)^{\frac{2}{3}}}{\left(ia\tan\left(fx+e\right)+a\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2/3)/(a+I*a*tan(f*x+e))^(1/3),x, algorithm="giac"
)
```

```
[Out] integrate((d*sec(f*x + e))^(2/3)/(I*a*tan(f*x + e) + a)^(1/3), x)
```

maple [F] time = 0.74, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(fx+e\right)\right)^{\frac{2}{3}}}{\left(a+ia\tan\left(fx+e\right)\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(2/3)/(a+I*a*tan(f*x+e))^(1/3),x)
```

```
[Out] int((d*sec(f*x+e))^(2/3)/(a+I*a*tan(f*x+e))^(1/3),x)
```

maxima [B] time = 1.10, size = 1753, normalized size = 5.16

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2/3)/(a+I*a*tan(f*x+e))^(1/3),x, algorithm="maxim
a")
```

```
[Out] 1/8*(-2*I*sqrt(3)*2^(1/3)*arctan2(2/3*sqrt(3)*(cos(2*f*x + 2*e)^2 + sin(2*f
*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/6)*cos(1/3*arctan2(sin(2*f*x + 2*e
), cos(2*f*x + 2*e) + 1)) + 1/3*sqrt(3), 1/3*sqrt(3)*(2*(cos(2*f*x + 2*e)^2
 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/6)*sin(1/3*arctan2(sin(2
```

```
*f*x + 2*e), cos(2*f*x + 2*e) + 1)) + sqrt(3))) - 2*I*sqrt(3)*2^(1/3)*arcta
n2(2/3*sqrt(3)*(cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e
) + 1)^(1/6)*cos(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) + 1/3
*sqrt(3), -1/3*sqrt(3)*(2*(cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(
2*f*x + 2*e) + 1)^(1/6)*sin(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e)
+ 1)) - sqrt(3))) + sqrt(3)*2^(1/3)*log(4/3*(cos(2*f*x + 2*e)^2 + sin(2*f*x
 + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/3)*(cos(1/3*arctan2(sin(2*f*x + 2*e)
, cos(2*f*x + 2*e) + 1))^2 + sin(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x +
2*e) + 1))^2) + 4/3*(cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x
+ 2*e) + 1)^(1/6)*(sqrt(3)*sin(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*
e) + 1)) + cos(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1))) + 4/3)
 - sqrt(3)*2^(1/3)*log(4/3*(cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos
(2*f*x + 2*e) + 1)^(1/3)*(cos(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e
) + 1))^2 + sin(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1))^2) - 4
/3*(cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/6)
*(sqrt(3)*sin(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) - cos(1/
3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1))) + 4/3) - 2*2^(1/3)*arct
an2((cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/3
)*sin(2/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) + (cos(2*f*x + 2
*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/6)*sin(1/3*arctan2(
sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)), (cos(2*f*x + 2*e)^2 + sin(2*f*x +
 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/3)*cos(2/3*arctan2(sin(2*f*x + 2*e), c
os(2*f*x + 2*e) + 1)) + (cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*
f*x + 2*e) + 1)^(1/6)*cos(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) +
1)) + 1) + 4*2^(1/3)*arctan2((cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*c
os(2*f*x + 2*e) + 1)^(1/6)*sin(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*
e) + 1)), (cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1
)^(1/6)*cos(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) - 1) - 2*I
*2^(1/3)*log((cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e)
+ 1)^(1/3)*cos(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1))^2 + (co
s(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/3)*sin(1
/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1))^2 - 2*(cos(2*f*x + 2*e)
^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/6)*cos(1/3*arctan2(sin
(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) + 1) + I*2^(1/3)*log((cos(2*f*x + 2*e
)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(2/3)*(cos(2/3*arctan2(s
in(2*f*x + 2*e), cos(2*f*x + 2*e) + 1))^2 + sin(2/3*arctan2(sin(2*f*x + 2*e
), cos(2*f*x + 2*e) + 1))^2) + (cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2
*cos(2*f*x + 2*e) + 1)^(1/3)*(cos(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x +
 2*e) + 1))^2 + sin(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1))^2)
 + 2*(cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/
3)*((cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/6
)*(cos(2/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1))*cos(1/3*arctan2
(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) + sin(2/3*arctan2(sin(2*f*x + 2*e
), cos(2*f*x + 2*e) + 1))*sin(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e
) + 1))) + cos(2/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1))) + 2*(c
os(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/6)*cos(
1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) + 1))*d^(2/3)/(a^(1/3)
*f)
```

mupad [F]   time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{2/3}}{\left(a+a\tan\left(e+f\,x\right)\,1\mathrm{i}\right)^{1/3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(2/3)/(a + a*tan(e + f*x)*1i)^(1/3),x)
```

```
[Out] int((d/cos(e + f*x))^(2/3)/(a + a*tan(e + f*x)*1i)^(1/3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(e+fx\right)\right)^{\frac{2}{3}}}{\sqrt[3]{ia\left(\tan\left(e+fx\right)-i\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(2/3)/(a+I*a*tan(f*x+e))**(1/3),x)
```

```
[Out] Integral((d*sec(e + f*x))**(2/3)/(I*a*(tan(e + f*x) - I))**(1/3), x)
```

3.446 $\int (d\sec(e+fx))^{2/3}(a+ia\tan(e+fx))^{2/3}\,dx$

Optimal. Leaf size=37

$$\frac{3ia(d\sec(e+fx))^{2/3}}{f\sqrt[3]{a+ia\tan(e+fx)}}$$

```
[Out] 3*I*a*(d*sec(f*x+e))^(2/3)/f/(a+I*a*tan(f*x+e))^(1/3)
```

Rubi [A] time = 0.08, antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.033$, Rules used = {3493}

$$\frac{3ia(d\sec(e+fx))^{2/3}}{f\sqrt[3]{a+ia\tan(e+fx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(2/3)*(a + I*a*Tan[e + f*x])^(2/3),x]
```

```
[Out] ((3*I)*a*(d*Sec[e + f*x])^(2/3))/(f*(a + I*a*Tan[e + f*x])^(1/3))
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rubi steps

$$\int (d\sec(e+fx))^{2/3}(a+ia\tan(e+fx))^{2/3}\,dx=\frac{3ia(d\sec(e+fx))^{2/3}}{f\sqrt[3]{a+ia\tan(e+fx)}}$$

Mathematica [A] time = 0.36, size = 47, normalized size = 1.27

$$\frac{3d^2(\tan(e+fx)+i)(a+ia\tan(e+fx))^{2/3}}{f(d\sec(e+fx))^{4/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(2/3)*(a + I*a*Tan[e + f*x])^(2/3),x]
```

```
[Out] (3*d^2*(I + Tan[e + f*x])*(a + I*a*Tan[e + f*x])^(2/3))/(f*(d*Sec[e + f*x])
^(4/3))
```

fricas [A] time = 0.64, size = 54, normalized size = 1.46

$$\frac{2^{\frac{1}{3}}\left(\frac{a}{e^{(2ifx+2ie)}+1}\right)^{\frac{2}{3}}\left(\frac{d}{e^{(2ifx+2ie)}+1}\right)^{\frac{2}{3}}\left(3ie^{(2ifx+2ie)}+3i\right)}{f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(2/3),x, algorithm="frica
s")
```

```
[Out] 2^(1/3)*(a/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*(d/(e^(2*I*f*x + 2*I*e) + 1))^(
2/3)*(3*I*e^(2*I*f*x + 2*I*e) + 3*I)/f
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{2}{3}}\left(i\,a\tan\left(fx+e\right)+a\right)^{\frac{2}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(2/3),x, algorithm="giac"
)
```

```
[Out] integrate((d*sec(f*x + e))^(2/3)*(I*a*tan(f*x + e) + a)^(2/3), x)
```

maple [F] time = 0.71, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{2}{3}}\left(a+ia\tan\left(fx+e\right)\right)^{\frac{2}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(2/3),x)
```

```
[Out] int((d*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(2/3),x)
```

maxima [B] time = 1.15, size = 106, normalized size = 2.86

$$\frac{\left(3i\cdot 2^{\frac{1}{3}}\cos\left(\frac{1}{3}\arctan\left(\sin\left(2fx+2e\right),\cos\left(2fx+2e\right)+1\right)\right)+3\cdot 2^{\frac{1}{3}}\sin\left(\frac{1}{3}\arctan\left(\sin\left(2fx+2e\right),\cos\left(2fx\right.\right.\right.\right.}{\left(\cos\left(2fx+2e\right)^{2}+\sin\left(2fx+2e\right)^{2}+2\cos\left(2fx+2e\right)+1\right)^{\frac{1}{6}}f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(2/3),x, algorithm="maxim
a")
```

```
[Out] (3*I*2^(1/3)*cos(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) + 3*2
^(1/3)*sin(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)))*a^(2/3)*d^
(2/3)/((cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(
1/6)*f)
```

mupad [B] time = 4.81, size = 81, normalized size = 2.19

$$\frac{3\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{2/3}\left(\cos\left(2\,e+2\,f\,x\right)\,1\mathrm{i}+\sin\left(2\,e+2\,f\,x\right)+1\mathrm{i}\right)\left(\frac{a\,\left(\cos\left(2\,e+2\,f\,x\right)+1+\sin\left(2\,e+2\,f\,x\right)\,1\mathrm{i}\right)}{\cos\left(2\,e+2\,f\,x\right)+1}\right)^{2/3}}{2\,f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(2/3)*(a + a*tan(e + f*x)*1i)^(2/3),x)
```

```
[Out] (3*(d/cos(e + f*x))^(2/3)*(cos(2*e + 2*f*x)*1i + sin(2*e + 2*f*x) + 1i)*((a
*(cos(2*e + 2*f*x) + sin(2*e + 2*f*x)*1i + 1))/(cos(2*e + 2*f*x) + 1))^(2/3
))/(2*f)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(e+fx\right)\right)^{\frac{2}{3}}\left(ia\left(\tan\left(e+fx\right)-i\right)\right)^{\frac{2}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(2/3)*(a+I*a*tan(f*x+e))**(2/3),x)
```

```
[Out] Integral((d*sec(e + f*x))**(2/3)*(I*a*(tan(e + f*x) - I))**(2/3), x)
```

3.447 $\int (d\sec(e+fx))^{2/3}(a+ia\tan(e+fx))^{5/3}\,dx$

Optimal. Leaf size=81

$$\frac{9ia^2(d\sec(e+fx))^{2/3}}{2f\sqrt[3]{a+ia\tan(e+fx)}}+\frac{3ia(a+ia\tan(e+fx))^{2/3}(d\sec(e+fx))^{2/3}}{4f}$$

```
[Out] 9/2*I*a^2*(d*sec(f*x+e))^(2/3)/f/(a+I*a*tan(f*x+e))^(1/3)+3/4*I*a*(d*sec(f*
x+e))^(2/3)*(a+I*a*tan(f*x+e))^(2/3)/f
```

Rubi [A] time = 0.15, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {3494, 3493}

$$\frac{9ia^2(d\sec(e+fx))^{2/3}}{2f\sqrt[3]{a+ia\tan(e+fx)}}+\frac{3ia(a+ia\tan(e+fx))^{2/3}(d\sec(e+fx))^{2/3}}{4f}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(2/3)*(a + I*a*Tan[e + f*x])^(5/3),x]
```

```
[Out] (((9*I)/2)*a^2*(d*Sec[e + f*x])^(2/3))/(f*(a + I*a*Tan[e + f*x])^(1/3)) + (
((3*I)/4)*a*(d*Sec[e + f*x])^(2/3)*(a + I*a*Tan[e + f*x])^(2/3))/f
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int (d\sec(e+fx))^{2/3}(a+ia\tan(e+fx))^{5/3}\,dx &= \frac{3ia(d\sec(e+fx))^{2/3}(a+ia\tan(e+fx))^{2/3}}{4f}+\frac{1}{2}(3a)\int (d\sec(e\\ &= \frac{9ia^2(d\sec(e+fx))^{2/3}}{2f\sqrt[3]{a+ia\tan(e+fx)}}+\frac{3ia(d\sec(e+fx))^{2/3}(a+ia\tan(e+\end{aligned}$$

Mathematica [A] time = 0.55, size = 70, normalized size = 0.86

$$-\frac{3ad(\cos(e)-i\sin(e))(\tan(e+fx)-7i)(\cos(fx)-i\sin(fx))(a+ia\tan(e+fx))^{2/3}}{4f\sqrt[3]{d\sec(e+fx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(2/3)*(a + I*a*Tan[e + f*x])^(5/3),x]
```

```
[Out] (-3*a*d*(Cos[e] - I*Sin[e])*(Cos[f*x] - I*Sin[f*x])*(-7*I + Tan[e + f*x])*(
a + I*a*Tan[e + f*x])^(2/3))/(4*f*(d*Sec[e + f*x])^(1/3))
```

fricas [A] time = 0.45, size = 58, normalized size = 0.72

$$\frac{2^{\frac{1}{3}}\left(12i\,ae^{\left(2i\,fx+2i\,e\right)}+9i\,a\right)\left(\frac{a}{e^{\left(2i\,fx+2i\,e\right)}+1}\right)^{\frac{2}{3}}\left(\frac{d}{e^{\left(2i\,fx+2i\,e\right)}+1}\right)^{\frac{2}{3}}}{2\,f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(5/3),x, algorithm="frica
s")
```

```
[Out] 1/2*2^(1/3)*(12*I*a*e^(2*I*f*x + 2*I*e) + 9*I*a)*(a/(e^(2*I*f*x + 2*I*e) +
1))^(2/3)*(d/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)/f
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(d\sec\left(fx+e\right)\right)^{\frac{2}{3}}\left(i\,a\tan\left(fx+e\right)+a\right)^{\frac{5}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(5/3),x, algorithm="giac"
)
```

```
[Out] integrate((d*sec(f*x + e))^(2/3)*(I*a*tan(f*x + e) + a)^(5/3), x)
```

maple [F] time = 0.76, size = 0, normalized size = 0.00

$$\int\left(d\sec\left(fx+e\right)\right)^{\frac{2}{3}}\left(a+ia\tan\left(fx+e\right)\right)^{\frac{5}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(5/3),x)
```

```
[Out] int((d*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(5/3),x)
```

maxima [B] time = 1.30, size = 318, normalized size = 3.93

$$\frac{3\left(-i\cdot2^{\frac{1}{3}}a\cos\left(\frac{4}{3}\arctan\left(\sin\left(2\,fx+2\,e\right),\cos\left(2\,fx+2\,e\right)+1\right)\right)-2^{\frac{1}{3}}a\sin\left(\frac{4}{3}\arctan\left(\sin\left(2\,fx+2\,e\right),\cos\left(2\,fx\right.\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(5/3),x, algorithm="maxim
a")
```

```
[Out] 1/2*(3*(-I*2^(1/3)*a*cos(4/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1
)) - 2^(1/3)*a*sin(4/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)))*sq
rt(cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)*a^(2/3
)*d^(2/3) - ((-12*I*2^(1/3)*a*cos(2*f*x + 2*e)^2 - 12*I*2^(1/3)*a*sin(2*f*x
 + 2*e)^2 - 24*I*2^(1/3)*a*cos(2*f*x + 2*e) - 12*I*2^(1/3)*a)*cos(1/3*arcta
n2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) - 12*(2^(1/3)*a*cos(2*f*x + 2*e
)^2 + 2^(1/3)*a*sin(2*f*x + 2*e)^2 + 2*2^(1/3)*a*cos(2*f*x + 2*e) + 2^(1/3)
*a)*sin(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)))*a^(2/3)*d^(2/
3))/((cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(7/
6)*f)
```

mupad [B] time = 4.13, size = 90, normalized size = 1.11

$$\frac{3\,a\,{\left(\frac{d}{2\,{\cos\left(\frac{e}{2}+\frac{f\,x}{2}\right)}^2-1}\right)}^{2/3}\,\left({\cos\left(e+f\,x\right)}^2\,6{}\mathrm{i}+3\,\sin\left(2\,e+2\,f\,x\right)+1{}\mathrm{i}\right)\,{\left(\frac{a\,\left(2\,{\cos\left(e+f\,x\right)}^2+\sin\left(2\,e+2\,f\,x\right)\,1{}\mathrm{i}\right)}{2\,{\cos\left(e+f\,x\right)}^2}\right)}^{2/3}}{4\,f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(2/3)*(a + a*tan(e + f*x)*1i)^(5/3),x)
```

```
[Out] (3*a*(d/(2*cos(e/2 + (f*x)/2)^2 - 1))^(2/3)*(3*sin(2*e + 2*f*x) + cos(e + f
*x)^2*6i + 1i)*((a*(sin(2*e + 2*f*x)*1i + 2*cos(e + f*x)^2))/(2*cos(e + f*x
)^2))^(2/3))/(4*f)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(2/3)*(a+I*a*tan(f*x+e))**(5/3),x)
```

```
[Out] Timed out
```

3.448 $\int (d\sec(e+fx))^{2/3}(a+ia\tan(e+fx))^{8/3}\,dx$

Optimal. Leaf size=122

$$\frac{54ia^3(d\sec(e+fx))^{2/3}}{7f\sqrt[3]{a+ia\tan(e+fx)}}+\frac{9ia^2(a+ia\tan(e+fx))^{2/3}(d\sec(e+fx))^{2/3}}{7f}+\frac{3ia(a+ia\tan(e+fx))^{5/3}(d\sec(e+fx))^{2/3}}{7f}$$

```
[Out] 54/7*I*a^3*(d*sec(f*x+e))^(2/3)/f/(a+I*a*tan(f*x+e))^(1/3)+9/7*I*a^2*(d*sec
(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(2/3)/f+3/7*I*a*(d*sec(f*x+e))^(2/3)*(a+I
*a*tan(f*x+e))^(5/3)/f
```

Rubi [A] time = 0.24, antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {3494, 3493}

$$\frac{54ia^3(d\sec(e+fx))^{2/3}}{7f\sqrt[3]{a+ia\tan(e+fx)}}+\frac{9ia^2(a+ia\tan(e+fx))^{2/3}(d\sec(e+fx))^{2/3}}{7f}+\frac{3ia(a+ia\tan(e+fx))^{5/3}(d\sec(e+fx))^{2/3}}{7f}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(2/3)*(a + I*a*Tan[e + f*x])^(8/3),x]
```

```
[Out] (((54*I)/7)*a^3*(d*Sec[e + f*x])^(2/3))/(f*(a + I*a*Tan[e + f*x])^(1/3)) +
(((9*I)/7)*a^2*(d*Sec[e + f*x])^(2/3)*(a + I*a*Tan[e + f*x])^(2/3))/f + (((
3*I)/7)*a*(d*Sec[e + f*x])^(2/3)*(a + I*a*Tan[e + f*x])^(5/3))/f
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int (d\sec(e+fx))^{2/3}(a+ia\tan(e+fx))^{8/3}\,dx &= \frac{3ia(d\sec(e+fx))^{2/3}(a+ia\tan(e+fx))^{5/3}}{7f}+\frac{1}{7}(12a)\int (d\sec(e+\\ &= \frac{9ia^2(d\sec(e+fx))^{2/3}(a+ia\tan(e+fx))^{2/3}}{7f}+\frac{3ia(d\sec(e+fx))^{2}\\ &= \frac{54ia^3(d\sec(e+fx))^{2/3}}{7f\sqrt[3]{a+ia\tan(e+fx)}}+\frac{9ia^2(d\sec(e+fx))^{2/3}(a+ia\tan(e+fx\end{aligned}$$

Mathematica [A] time = 0.62, size = 100, normalized size = 0.82

$$\frac{3a^2(a+ia\tan(e+fx))^{2/3}(d\sec(e+fx))^{5/3}(\sin(e-fx)+i\cos(e-fx))(5i\sin(2(e+fx))+23\cos(2(e+fx))+2}{14df(\cos(fx)+i\sin(fx))^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(2/3)*(a + I*a*Tan[e + f*x])^(8/3),x]
```

```
[Out] (3*a^2*(d*Sec[e + f*x])^(5/3)*(I*Cos[e - f*x] + Sin[e - f*x])*(21 + 23*Cos[
2*(e + f*x)] + (5*I)*Sin[2*(e + f*x)])*(a + I*a*Tan[e + f*x])^(2/3))/(14*d*
f*(Cos[f*x] + I*Sin[f*x])^2)
```

fricas [A] time = 0.73, size = 107, normalized size = 0.88

$$\frac{2 \cdot 2^{\frac{1}{3}} \left(42i\,a^2 e^{\left(4i\,fx+4i\,e\right)} + 63i\,a^2 e^{\left(2i\,fx+2i\,e\right)} + 27i\,a^2\right) \left(\frac{a}{e^{\left(2i\,fx+2i\,e\right)}+1}\right)^{\frac{2}{3}} \left(\frac{d}{e^{\left(2i\,fx+2i\,e\right)}+1}\right)^{\frac{2}{3}} e^{\left(2i\,fx+2i\,e\right)}}{7 \left(fe^{\left(4i\,fx+4i\,e\right)} + fe^{\left(2i\,fx+2i\,e\right)}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(8/3),x, algorithm="frica
s")
```

```
[Out] 2/7*2^(1/3)*(42*I*a^2*e^(4*I*f*x + 4*I*e) + 63*I*a^2*e^(2*I*f*x + 2*I*e) +
27*I*a^2)*(a/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*(d/(e^(2*I*f*x + 2*I*e) + 1))
^(2/3)*e^(2*I*f*x + 2*I*e)/(f*e^(4*I*f*x + 4*I*e) + f*e^(2*I*f*x + 2*I*e))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d \sec \left(fx + e\right)\right)^{\frac{2}{3}} \left(i\,a \tan \left(fx + e\right) + a\right)^{\frac{8}{3}} \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(8/3),x, algorithm="giac"
)
```

```
[Out] integrate((d*sec(f*x + e))^(2/3)*(I*a*tan(f*x + e) + a)^(8/3), x)
```

maple [F] time = 0.78, size = 0, normalized size = 0.00

$$\int \left(d \sec \left(fx + e\right)\right)^{\frac{2}{3}} \left(a + ia \tan \left(fx + e\right)\right)^{\frac{8}{3}} \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(8/3),x)
```

```
[Out] int((d*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(8/3),x)
```

maxima [B] time = 1.09, size = 402, normalized size = 3.30

$$\frac{42 \left(-i \cdot 2^{\frac{1}{3}} a^2 \cos \left(\frac{4}{3} \arctan \left(\sin \left(2\,fx + 2\,e\right), \cos \left(2\,fx + 2\,e\right) + 1\right)\right) - 2^{\frac{1}{3}} a^2 \sin \left(\frac{4}{3} \arctan \left(\sin \left(2\,fx + 2\,e\right), \text{co}\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(8/3),x, algorithm="maxim
a")
```

```
[Out] 1/7*(42*(-I*2^(1/3)*a^2*cos(4/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e)
+ 1)) - 2^(1/3)*a^2*sin(4/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)
))*sqrt(cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)*a
^(2/3)*d^(2/3) - (-12*I*2^(1/3)*a^2*cos(7/3*arctan2(sin(2*f*x + 2*e), cos(2
```

```
*f*x + 2*e) + 1)) - 12*2^(1/3)*a^2*sin(7/3*arctan2(sin(2*f*x + 2*e), cos(2*
f*x + 2*e) + 1)) + (-84*I*2^(1/3)*a^2*cos(2*f*x + 2*e)^2 - 84*I*2^(1/3)*a^2
*sin(2*f*x + 2*e)^2 - 168*I*2^(1/3)*a^2*cos(2*f*x + 2*e) - 84*I*2^(1/3)*a^2
)*cos(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) - 84*(2^(1/3)*a^
2*cos(2*f*x + 2*e)^2 + 2^(1/3)*a^2*sin(2*f*x + 2*e)^2 + 2*2^(1/3)*a^2*cos(2
*f*x + 2*e) + 2^(1/3)*a^2)*sin(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*
e) + 1)))*a^(2/3)*d^(2/3))/((cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*co
s(2*f*x + 2*e) + 1)^(7/6)*f)
```

mupad [B] time = 5.27, size = 122, normalized size = 1.00

$$\frac{3\,a^2\,{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{2/3}\,{\left(\frac{a\,\left(\cos\left(2\,e+2\,f\,x\right)+1+\sin\left(2\,e+2\,f\,x\right)\,1{}\mathrm{i}\right)}{\cos\left(2\,e+2\,f\,x\right)+1}\right)}^{2/3}\,\left(\cos\left(2\,e+2\,f\,x\right)\,44{}\mathrm{i}+\cos\left(4\,e+4\,f\,x\right)\,9{}\mathrm{i}+16\,\sin\left(2\,e+2\right.\right.}{14\,f\,\left(\cos\left(2\,e+2\,f\,x\right)+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(2/3)*(a + a*tan(e + f*x)*1i)^(8/3),x)
```

```
[Out] (3*a^2*(d/cos(e + f*x))^(2/3)*((a*(cos(2*e + 2*f*x) + sin(2*e + 2*f*x)*1i +
 1))/(cos(2*e + 2*f*x) + 1))^(2/3)*(cos(2*e + 2*f*x)*44i + cos(4*e + 4*f*x)
*9i + 16*sin(2*e + 2*f*x) + 9*sin(4*e + 4*f*x) + 35i))/(14*f*(cos(2*e + 2*f
*x) + 1))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(2/3)*(a+I*a*tan(f*x+e))**(8/3),x)
```

```
[Out] Timed out
```

3.449 $\int (d\sec(e+fx))^{2/3}(a+ia\tan(e+fx))^{11/3}\,dx$

Optimal. Leaf size=163

$$\frac{486ia^4(d\sec(e+fx))^{2/3}}{35f\sqrt[3]{a+ia\tan(e+fx)}}+\frac{81ia^3(a+ia\tan(e+fx))^{2/3}(d\sec(e+fx))^{2/3}}{35f}+\frac{27ia^2(a+ia\tan(e+fx))^{5/3}(d\sec(e+$$

```
[Out] 486/35*I*a^4*(d*sec(f*x+e))^(2/3)/f/(a+I*a*tan(f*x+e))^(1/3)+81/35*I*a^3*(d
*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(2/3)/f+27/35*I*a^2*(d*sec(f*x+e))^(2
/3)*(a+I*a*tan(f*x+e))^(5/3)/f+3/10*I*a*(d*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x
+e))^(8/3)/f
```

Rubi [A] time = 0.32, antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {3494, 3493}

$$\frac{486ia^4(d\sec(e+fx))^{2/3}}{35f\sqrt[3]{a+ia\tan(e+fx)}}+\frac{81ia^3(a+ia\tan(e+fx))^{2/3}(d\sec(e+fx))^{2/3}}{35f}+\frac{27ia^2(a+ia\tan(e+fx))^{5/3}(d\sec(e+$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(2/3)*(a + I*a*Tan[e + f*x])^(11/3),x]
```

```
[Out] (((486*I)/35)*a^4*(d*Sec[e + f*x])^(2/3))/(f*(a + I*a*Tan[e + f*x])^(1/3))
+ (((81*I)/35)*a^3*(d*Sec[e + f*x])^(2/3)*(a + I*a*Tan[e + f*x])^(2/3))/f +
 (((27*I)/35)*a^2*(d*Sec[e + f*x])^(2/3)*(a + I*a*Tan[e + f*x])^(5/3))/f +
(((3*I)/10)*a*(d*Sec[e + f*x])^(2/3)*(a + I*a*Tan[e + f*x])^(8/3))/f
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int (d\sec(e+fx))^{2/3}(a+ia\tan(e+fx))^{11/3}\,dx &= \frac{3ia(d\sec(e+fx))^{2/3}(a+ia\tan(e+fx))^{8/3}}{10f}+\frac{1}{5}(9a)\int (d\sec(\\ &= \frac{27ia^2(d\sec(e+fx))^{2/3}(a+ia\tan(e+fx))^{5/3}}{35f}+\frac{3ia(d\sec(e+\\ &= \frac{81ia^3(d\sec(e+fx))^{2/3}(a+ia\tan(e+fx))^{2/3}}{35f}+\frac{27ia^2(d\sec(e\\ &= \frac{486ia^4(d\sec(e+fx))^{2/3}}{35f\sqrt[3]{a+ia\tan(e+fx)}}+\frac{81ia^3(d\sec(e+fx))^{2/3}(a+ia\tan(\\ &\qquad 35f\end{aligned}$$

Mathematica [A] time = 1.15, size = 116, normalized size = 0.71

$$\frac{3a^3(a+ia\tan(e+fx))^{2/3}(d\sec(e+fx))^{5/3}(\sin(e-2fx)+i\cos(e-2fx))(442\cos(2(e+fx))+45i\tan(e+fx)+}{140df(\cos(fx)+i\sin(fx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(2/3)*(a + I*a*Tan[e + f*x])^(11/3),x]
```

```
[Out] (3*a^3*(d*Sec[e + f*x])^(5/3)*(I*Cos[e - 2*f*x] + Sin[e - 2*f*x])*(364 + 44
2*Cos[2*(e + f*x)] + (59*I)*Sec[e + f*x]*Sin[3*(e + f*x)] + (45*I)*Tan[e +
f*x])*(a + I*a*Tan[e + f*x])^(2/3))/(140*d*f*(Cos[f*x] + I*Sin[f*x])^3)
```

fricas [A] time = 0.68, size = 133, normalized size = 0.82

$$\frac{2\cdot 2^{\frac{1}{3}}\left(420i\,a^3e^{\left(6i\,fx+6i\,e\right)}+945i\,a^3e^{\left(4i\,fx+4i\,e\right)}+810i\,a^3e^{\left(2i\,fx+2i\,e\right)}+243i\,a^3\right)\left(\frac{a}{e^{\left(2i\,fx+2i\,e\right)}+1}\right)^{\frac{2}{3}}\left(\frac{d}{e^{\left(2i\,fx+2i\,e\right)}+1}\right)^{\frac{2}{3}}e^{\left(2i\,fx+2i\,e\right)}}{35\left(fe^{\left(6i\,fx+6i\,e\right)}+2\,fe^{\left(4i\,fx+4i\,e\right)}+fe^{\left(2i\,fx+2i\,e\right)}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(11/3),x, algorithm="fric
as")
```

```
[Out] 2/35*2^(1/3)*(420*I*a^3*e^(6*I*f*x + 6*I*e) + 945*I*a^3*e^(4*I*f*x + 4*I*e)
 + 810*I*a^3*e^(2*I*f*x + 2*I*e) + 243*I*a^3)*(a/(e^(2*I*f*x + 2*I*e) + 1))
^(2/3)*(d/(e^(2*I*f*x + 2*I*e) + 1))^(2/3)*e^(2*I*f*x + 2*I*e)/(f*e^(6*I*f*
x + 6*I*e) + 2*f*e^(4*I*f*x + 4*I*e) + f*e^(2*I*f*x + 2*I*e))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(d\sec\left(fx+e\right)\right)^{\frac{2}{3}}\left(i\,a\tan\left(fx+e\right)+a\right)^{\frac{11}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(11/3),x, algorithm="giac
")
```

```
[Out] integrate((d*sec(f*x + e))^(2/3)*(I*a*tan(f*x + e) + a)^(11/3), x)
```

maple [F] time = 0.77, size = 0, normalized size = 0.00

$$\int\left(d\sec\left(fx+e\right)\right)^{\frac{2}{3}}\left(a+ia\tan\left(fx+e\right)\right)^{\frac{11}{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(11/3),x)
```

```
[Out] int((d*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(11/3),x)
```

maxima [B] time = 1.08, size = 977, normalized size = 5.99

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2/3)*(a+I*a*tan(f*x+e))^(11/3),x, algorithm="maxi
ma")
```

```
[Out] -1/35*((84*I*2^(1/3)*a^3*cos(10/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e
) + 1)) + 84*2^(1/3)*a^3*sin(10/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e
```

```
) + 1)) + (630*I*2^(1/3)*a^3*cos(2*f*x + 2*e)^2 + 630*I*2^(1/3)*a^3*sin(2*f
*x + 2*e)^2 + 1260*I*2^(1/3)*a^3*cos(2*f*x + 2*e) + 630*I*2^(1/3)*a^3)*cos(
4/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) + 630*(2^(1/3)*a^3*cos
(2*f*x + 2*e)^2 + 2^(1/3)*a^3*sin(2*f*x + 2*e)^2 + 2*2^(1/3)*a^3*cos(2*f*x
+ 2*e) + 2^(1/3)*a^3)*sin(4/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) +
1)))*sqrt(cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)
*a^(2/3)*d^(2/3) + ((-360*I*2^(1/3)*a^3*cos(2*f*x + 2*e)^2 - 360*I*2^(1/3)*
a^3*sin(2*f*x + 2*e)^2 - 720*I*2^(1/3)*a^3*cos(2*f*x + 2*e) - 360*I*2^(1/3)
*a^3)*cos(7/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1)) + (-840*I*2^
(1/3)*a^3*cos(2*f*x + 2*e)^4 - 840*I*2^(1/3)*a^3*sin(2*f*x + 2*e)^4 - 3360*
I*2^(1/3)*a^3*cos(2*f*x + 2*e)^3 - 5040*I*2^(1/3)*a^3*cos(2*f*x + 2*e)^2 -
3360*I*2^(1/3)*a^3*cos(2*f*x + 2*e) - 840*I*2^(1/3)*a^3 + (-1680*I*2^(1/3)*
a^3*cos(2*f*x + 2*e)^2 - 3360*I*2^(1/3)*a^3*cos(2*f*x + 2*e) - 1680*I*2^(1/
3)*a^3)*sin(2*f*x + 2*e)^2)*cos(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2
*e) + 1)) - 360*(2^(1/3)*a^3*cos(2*f*x + 2*e)^2 + 2^(1/3)*a^3*sin(2*f*x + 2
*e)^2 + 2*2^(1/3)*a^3*cos(2*f*x + 2*e) + 2^(1/3)*a^3)*sin(7/3*arctan2(sin(2
*f*x + 2*e), cos(2*f*x + 2*e) + 1)) - 840*(2^(1/3)*a^3*cos(2*f*x + 2*e)^4 +
 2^(1/3)*a^3*sin(2*f*x + 2*e)^4 + 4*2^(1/3)*a^3*cos(2*f*x + 2*e)^3 + 6*2^(1
/3)*a^3*cos(2*f*x + 2*e)^2 + 4*2^(1/3)*a^3*cos(2*f*x + 2*e) + 2^(1/3)*a^3 +
 2*(2^(1/3)*a^3*cos(2*f*x + 2*e)^2 + 2*2^(1/3)*a^3*cos(2*f*x + 2*e) + 2^(1/
3)*a^3)*sin(2*f*x + 2*e)^2)*sin(1/3*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2
*e) + 1)))*a^(2/3)*d^(2/3))/((cos(2*f*x + 2*e)^4 + sin(2*f*x + 2*e)^4 + 4*c
os(2*f*x + 2*e)^3 + 2*(cos(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)*sin(2*f
*x + 2*e)^2 + 6*cos(2*f*x + 2*e)^2 + 4*cos(2*f*x + 2*e) + 1)*(cos(2*f*x + 2
*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/6)*f)
```

mupad [B] time = 7.88, size = 303, normalized size = 1.86

$$\left(-\frac{d}{2\sin\left(\frac{e}{2}+\frac{f\,x}{2}\right)^2-1}\right)^{2/3}\left(2\sin\left(2\,e+2\,f\,x\right)^2+\sin\left(4\,e+4\,f\,x\right)\,1\mathrm{i}-1\right)\left(\frac{a^3\left(a-\frac{a\,\sin\left(e+f\,x\right)\,1\mathrm{i}}{2\sin\left(\frac{e}{2}+\frac{f\,x}{2}\right)^2-1}\right)^{2/3}243\mathrm{i}}{35\,f}+\frac{a^3\left(a-\frac{a\,\sin\left(e+f\,x\right)\,1\mathrm{i}}{2\sin\left(\frac{e}{2}+\frac{f\,x}{2}\right)^2-\cdots}\right.}{\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(2/3)*(a + a*tan(e + f*x)*1i)^(11/3),x)
```

```
[Out] ((-d/(2*sin(e/2 + (f*x)/2)^2 - 1))^(2/3)*(sin(4*e + 4*f*x)*1i + 2*sin(2*e +
 2*f*x)^2 - 1)*((a^3*(a - (a*sin(e + f*x)*1i)/(2*sin(e/2 + (f*x)/2)^2 - 1))
^(2/3)*243i)/(35*f) + (a^3*(a - (a*sin(e + f*x)*1i)/(2*sin(e/2 + (f*x)/2)^2
 - 1))^(2/3)*(sin(2*e + 2*f*x)*1i - 2*sin(e + f*x)^2 + 1)*162i)/(7*f) + (a^
3*(a - (a*sin(e + f*x)*1i)/(2*sin(e/2 + (f*x)/2)^2 - 1))^(2/3)*(sin(4*e + 4
*f*x)*1i - 2*sin(2*e + 2*f*x)^2 + 1)*27i)/f + (a^3*(a - (a*sin(e + f*x)*1i)
/(2*sin(e/2 + (f*x)/2)^2 - 1))^(2/3)*(sin(6*e + 6*f*x)*1i - 2*sin(3*e + 3*f
*x)^2 + 1)*12i)/f))/(4*(sin(e + f*x)^2 - 1))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(2/3)*(a+I*a*tan(f*x+e))**(11/3),x)
```

```
[Out] Timed out
```

3.450 $\int (e\sec(c+dx))^m (a+ia\tan(c+dx))^5\,dx$

Optimal. Leaf size=86

$$\frac{ia^5 2^{\frac{m}{2}+5}(1+i\tan(c+dx))^{-m/2}(e\sec(c+dx))^m\,{}_2F_1\left(-\frac{m}{2}-4,\frac{m}{2};\frac{m+2}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{dm}$$

```
[Out] I*2^(5+1/2*m)*a^5*hypergeom([1/2*m, -4-1/2*m],[1+1/2*m],1/2-1/2*I*tan(d*x+c
))*(e*sec(d*x+c))^m/d/m/((1+I*tan(d*x+c))^(1/2*m))
```

Rubi [A] time = 0.15, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.154$, Rules used = {3505, 3523, 70, 69}

$$\frac{ia^5 2^{\frac{m}{2}+5}(1+i\tan(c+dx))^{-m/2}(e\sec(c+dx))^m\text{Hypergeometric2F1}\left(-\frac{m}{2}-4,\frac{m}{2},\frac{m+2}{2},\frac{1}{2}(1-i\tan(c+dx))\right)}{dm}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] (I*2^(5 + m/2)*a^5*Hypergeometric2F1[-4 - m/2, m/2, (2 + m)/2, (1 - I*Tan[c
 + d*x])/2]*(e*Sec[c + d*x])^m)/(d*m*(1 + I*Tan[c + d*x])^(m/2))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^m(a+ia\tan(c+dx))^5\,dx = \left((e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)$$

$$= \frac{\left(a^2(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/}\right.}{d}$$

$$= \frac{\left(2^{4+\frac{m}{2}}a^6(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{-m/}\right.}{d}$$

$$= \frac{i2^{5+\frac{m}{2}}a^5\,{}_2F_1\left(-4-\frac{m}{2},\frac{m}{2};\frac{2+m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx))}{dm}$$

Mathematica [**B**] time = 12.92, size = 1165, normalized size = 13.55

$$-\frac{i2^{m+5}e^{-i(c-4dx)}\left(2+3e^{2ic}\right)\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^m {}_2F_1\left(1,-\frac{m}{2}-1;\frac{m+6}{2};-e^{2i(c+dx)}\right)(e\sec(c+dx))^m(i\tan(c+dx)a+a)^5\,\mathrm{se}}{d\left(1+e^{2ic}\right)\left(1+e^{2i(c+dx)}\right)^3(m+4)(\cos(dx)+i\sin(dx))^5}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x])^5,x]
```

```
[Out] ((-I)*2^(5 + m)*(2 + 3*E^((2*I)*c))*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x
))))^m*Hypergeometric2F1[1, -1 - m/2, (6 + m)/2, -E^((2*I)*(c + d*x))]*Sec[
c + d*x]^(-5 - m)*(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x])^5)/(d*E^(I*(c -
 4*d*x))*(1 + E^((2*I)*c))*(1 + E^((2*I)*(c + d*x)))^3*(4 + m)*(Cos[d*x] +
I*Sin[d*x])^5) + (I*2^(5 + m)*E^(I*(c - d*m*x))*(E^(I*(c + d*x))/(1 + E^((2
*I)*(c + d*x))))^m*(E^(I*d*(4 + m)*x)*(6 + m)*Hypergeometric2F1[1, -2 - m/2
, (6 + m)/2, -E^((2*I)*(c + d*x))] - E^(I*d*(6 + m)*x)*(4 + m)*Hypergeometr
ic2F1[1, -1 - m/2, (8 + m)/2, -E^((2*I)*(c + d*x))])*Sec[c + d*x]^(-5 - m)*
(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x])^5)/(d*(1 + E^((2*I)*c))*(1 + E^((
2*I)*(c + d*x)))^4*(4 + m)*(6 + m)*(Cos[d*x] + I*Sin[d*x])^5) - (I*2^(5 + m
)*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x))))^m*(1 + E^((2*I)*(c + d*x)))*H
ypergeometric2F1[1, 1 - m/2, (2 + m)/2, -E^((2*I)*(c + d*x))]*Sec[c + d*x]^
(-5 - m)*(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x])^5)/(d*(E^((3*I)*c) + E^(
(5*I)*c))*m*(Cos[d*x] + I*Sin[d*x])^5) + (I*2^(5 + m)*(E^(I*(c + d*x))/(1 +
 E^((2*I)*(c + d*x))))^m*(-(E^(I*d*(2 + m)*x)*m*Hypergeometric2F1[1, 1 - m/
2, (4 + m)/2, -E^((2*I)*(c + d*x))]) + E^(I*d*m*x)*(2 + m)*Hypergeometric2F
1[1, -1/2*m, (2 + m)/2, -E^((2*I)*(c + d*x))])*Sec[c + d*x]^(-5 - m)*(e*Sec
[c + d*x])^m*(a + I*a*Tan[c + d*x])^5)/(d*E^(I*(3*c + d*m*x))*(1 + E^((2*I)
*c))*m*(2 + m)*(Cos[d*x] + I*Sin[d*x])^5) + (I*2^(5 + m)*E^(I*(-4*c + d*x))
*(1 + 4*E^((2*I)*c))*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x))))^(1 + m)*Hy
pergeometric2F1[1, -1/2*m, (4 + m)/2, -E^((2*I)*(c + d*x))]*Sec[c + d*x]^(-
5 - m)*(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x])^5)/(d*(1 + E^((2*I)*c))*(2
 + m)*(Cos[d*x] + I*Sin[d*x])^5) - ((3*I)*2^(5 + m)*(E^(I*(c + d*x))/(1 + E
^((2*I)*(c + d*x))))^m*(E^(I*d*(2 + m)*x)*(4 + m)*Hypergeometric2F1[1, -1 -
 m/2, (4 + m)/2, -E^((2*I)*(c + d*x))] - E^(I*d*(4 + m)*x)*(2 + m)*Hypergeo
metric2F1[1, -1/2*m, (6 + m)/2, -E^((2*I)*(c + d*x))])*Sec[c + d*x]^(-5 - m
)*(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x])^5)/(d*E^(I*(c + d*m*x))*(1 + E^
((2*I)*c))*(1 + E^((2*I)*(c + d*x)))^2*(2 + m)*(4 + m)*(Cos[d*x] + I*Sin[d*
x])^5)
```

fricas [**F**] time = 0.70, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{32\,a^5\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^m e^{(10i\,dx+10i\,c)}}{e^{(10i\,dx+10i\,c)}+5\,e^{(8i\,dx+8i\,c)}+10\,e^{(6i\,dx+6i\,c)}+10\,e^{(4i\,dx+4i\,c)}+5\,e^{(2i\,dx+2i\,c)}+1},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^5,x, algorithm="fricas")
```

```
[Out] integral(32*a^5*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^m*e^(10*I*d
*x + 10*I*c)/(e^(10*I*d*x + 10*I*c) + 5*e^(8*I*d*x + 8*I*c) + 10*e^(6*I*d*x
 + 6*I*c) + 10*e^(4*I*d*x + 4*I*c) + 5*e^(2*I*d*x + 2*I*c) + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^5\,(e\sec(dx+c))^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^5,x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^5*(e*sec(d*x + c))^m, x)
```

maple [F] time = 1.21, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^m\,(a+ia\tan(dx+c))^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^5,x)
```

```
[Out] int((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^5,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^5\,(e\sec(dx+c))^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^5,x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^5*(e*sec(d*x + c))^m, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(\frac{e}{\cos(c+d\,x)}\right)^m\,(a+a\tan(c+d\,x)\,1\mathrm{i})^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^5,x)
```

```
[Out] int((e/cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^5, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$ia^5\left(\int \left(-i\,(e\sec(c+dx))^m\right)dx+\int 5\,(e\sec(c+dx))^m\tan(c+dx)\,dx+\int \left(-10\,(e\sec(c+dx))^m\tan^3(c+dx)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**m*(a+I*a*tan(d*x+c))**5,x)
```

```
[Out] I*a**5*(Integral(-I*(e*sec(c + d*x))**m, x) + Integral(5*(e*sec(c + d*x))**
m*tan(c + d*x), x) + Integral(-10*(e*sec(c + d*x))**m*tan(c + d*x)**3, x) +
 Integral((e*sec(c + d*x))**m*tan(c + d*x)**5, x) + Integral(10*I*(e*sec(c
+ d*x))**m*tan(c + d*x)**2, x) + Integral(-5*I*(e*sec(c + d*x))**m*tan(c +
d*x)**4, x))
```

3.451 $\int (e\sec(c+dx))^m(a+ia\tan(c+dx))^3\,dx$

Optimal. Leaf size=86

$$\frac{ia^3 2^{\frac{m}{2}+3}(1+i\tan(c+dx))^{-m/2}(e\sec(c+dx))^m\,{}_2F_1\left(-\frac{m}{2}-2,\frac{m}{2};\frac{m+2}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{dm}$$

```
[Out] I*2^(3+1/2*m)*a^3*hypergeom([1/2*m, -2-1/2*m],[1+1/2*m],1/2-1/2*I*tan(d*x+c
))*(e*sec(d*x+c))^m/d/m/((1+I*tan(d*x+c))^(1/2*m))
```

Rubi [A] time = 0.15, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3505, 3523, 70, 69}

$$\frac{ia^3 2^{\frac{m}{2}+3}(1+i\tan(c+dx))^{-m/2}(e\sec(c+dx))^m\text{Hypergeometric2F1}\left(-\frac{m}{2}-2,\frac{m}{2},\frac{m+2}{2},\frac{1}{2}(1-i\tan(c+dx))\right)}{dm}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (I*2^(3 + m/2)*a^3*Hypergeometric2F1[-2 - m/2, m/2, (2 + m)/2, (1 - I*Tan[c
 + d*x])/2]*(e*Sec[c + d*x])^m)/(d*m*(1 + I*Tan[c + d*x])^(m/2))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^m(a+ia\tan(c+dx))^3\,dx = \left((e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)\int($$

$$= \frac{\left(a^2(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)S}{d}$$

$$= \frac{\left(2^{2+\frac{m}{2}}a^4(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{-m/2}\right)S}{d}$$

$$= \frac{i2^{3+\frac{m}{2}}a^3\,{}_2F_1\left(-2-\frac{m}{2},\frac{m}{2};\frac{2+m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx))^m(1}{dm}$$

Mathematica [B] time = 6.19, size = 430, normalized size = 5.00

$$-\frac{ie^{-ic}2^{m+3}\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^m(a+ia\tan(c+dx))^3\left(\frac{\left(1+e^{2i(c+dx)}\right){}_2F_1\left(1,1-\frac{m}{2};\frac{m+2}{2};-e^{2i(c+dx)}\right)}{m}+\frac{e^{2idx}\,{}_2F_1\left(1,1-\frac{m}{2};\frac{m+4}{2};-e^{2i(c+dx)}\right)}{m+2}-\frac{{}_2F_1\left(1,\right.}{}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] ((-I)*2^(3 + m)*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x))))^m*(((1 + E^((2*
I)*(c + d*x)))*Hypergeometric2F1[1, 1 - m/2, (2 + m)/2, -E^((2*I)*(c + d*x)
)])/m + (E^((2*I)*d*x)*Hypergeometric2F1[1, 1 - m/2, (4 + m)/2, -E^((2*I)*(
c + d*x))])/(2 + m) - Hypergeometric2F1[1, -1/2*m, (2 + m)/2, -E^((2*I)*(c
+ d*x))]/m - (E^((2*I)*d*x)*(1 + 2*E^((2*I)*c))*Hypergeometric2F1[1, -1/2*m
, (4 + m)/2, -E^((2*I)*(c + d*x))])/((1 + E^((2*I)*(c + d*x)))*(2 + m)) + (
E^((2*I)*c - I*d*m*x)*(E^(I*d*(2 + m)*x)*(4 + m)*Hypergeometric2F1[1, -1 -
m/2, (4 + m)/2, -E^((2*I)*(c + d*x))] - E^(I*d*(4 + m)*x)*(2 + m)*Hypergeom
etric2F1[1, -1/2*m, (6 + m)/2, -E^((2*I)*(c + d*x))]))/((1 + E^((2*I)*(c +
d*x)))^2*(2 + m)*(4 + m)))*Sec[c + d*x]^(-3 - m)*(e*Sec[c + d*x])^m*(a + I*
a*Tan[c + d*x])^3)/(d*E^(I*c)*(1 + E^((2*I)*c))*(Cos[d*x] + I*Sin[d*x])^3)
```

fricas [F] time = 1.81, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{8\,a^3\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^m e^{(6i\,dx+6i\,c)}}{e^{(6i\,dx+6i\,c)}+3\,e^{(4i\,dx+4i\,c)}+3\,e^{(2i\,dx+2i\,c)}+1},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] integral(8*a^3*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^m*e^(6*I*d*x
 + 6*I*c)/(e^(6*I*d*x + 6*I*c) + 3*e^(4*I*d*x + 4*I*c) + 3*e^(2*I*d*x + 2*I
*c) + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^3\,(e\sec(dx+c))^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^3*(e*sec(d*x + c))^m, x)
```

maple [F] time = 1.42, size = 0, normalized size = 0.00

$$\int (e\sec (dx+c))^{m} (a+ia\tan (dx+c))^{3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] int((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan (dx+c)+a)^{3} (e\sec (dx+c))^{m}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^3*(e*sec(d*x + c))^m, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(\frac{e}{\cos (c+d\,x)}\right)}^m\,{\left(a+a\,\tan (c+d\,x)\,1{}\mathrm{i}\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] int((e/cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-ia^{3} \left(\int i (e\sec (c+dx))^{m}\, dx + \int \left(-3 (e\sec (c+dx))^{m} \tan (c+dx)\right) dx + \int (e\sec (c+dx))^{m} \tan^{3} (c+dx)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**m*(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] -I*a**3*(Integral(I*(e*sec(c + d*x))**m, x) + Integral(-3*(e*sec(c + d*x))*
*m*tan(c + d*x), x) + Integral((e*sec(c + d*x))**m*tan(c + d*x)**3, x) + In
tegral(-3*I*(e*sec(c + d*x))**m*tan(c + d*x)**2, x))
```

3.452 $\int (e\sec(c+dx))^m(a+ia\tan(c+dx))^2\,dx$

Optimal. Leaf size=86

$$\frac{ia^2 2^{\frac{m}{2}+2}(1+i\tan(c+dx))^{-m/2}(e\sec(c+dx))^m\,{}_2F_1\left(-\frac{m}{2}-1,\frac{m}{2};\frac{m+2}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{dm}$$

```
[Out] I*2^(2+1/2*m)*a^2*hypergeom([1/2*m, -1-1/2*m],[1+1/2*m],1/2-1/2*I*tan(d*x+c
))*(e*sec(d*x+c))^m/d/m/((1+I*tan(d*x+c))^(1/2*m))
```

Rubi [A] time = 0.15, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3505, 3523, 70, 69}

$$\frac{ia^2 2^{\frac{m}{2}+2}(1+i\tan(c+dx))^{-m/2}(e\sec(c+dx))^m\text{Hypergeometric2F1}\left(-\frac{m}{2}-1,\frac{m}{2},\frac{m+2}{2},\frac{1}{2}(1-i\tan(c+dx))\right)}{dm}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (I*2^(2 + m/2)*a^2*Hypergeometric2F1[-1 - m/2, m/2, (2 + m)/2, (1 - I*Tan[c
 + d*x])/2]*(e*Sec[c + d*x])^m)/(d*m*(1 + I*Tan[c + d*x])^(m/2))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^m(a+ia\tan(c+dx))^2\,dx = \Big((e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\Big)$$

$$= \frac{\big(a^2(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/}}{d}$$

$$= \frac{\Big(2^{1+\frac{m}{2}}a^3(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{-m/}}{d}$$

$$= \frac{i2^{2+\frac{m}{2}}a^2\,{}_2F_1\left(-1-\frac{m}{2},\frac{m}{2};\frac{2+m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx))}{dm}$$

Mathematica [A] time = 1.17, size = 141, normalized size = 1.64

$$-\frac{i2^{m+2}e^{i(c+3dx)}\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{m+1}(a+ia\tan(c+dx))^2\,{}_2F_1\left(1,1-\frac{m}{2};\frac{m+6}{2};-e^{2i(c+dx)}\right)\sec^{-m-2}(c+dx)(e\sec(c+dx)}{d(m+4)(\cos(dx)+i\sin(dx))^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x])^2,x]
[Out] ((-I)*2^(2 + m)*E^(I*(c + 3*d*x))*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x))
))^(1 + m)*Hypergeometric2F1[1, 1 - m/2, (6 + m)/2, -E^((2*I)*(c + d*x))]*S
ec[c + d*x]^(-2 - m)*(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x])^2)/(d*(4 + m
)*(Cos[d*x] + I*Sin[d*x])^2)
```

fricas [F] time = 0.65, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{4\,a^2\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^m e^{(4i\,dx+4i\,c)}}{e^{(4i\,dx+4i\,c)}+2\,e^{(2i\,dx+2i\,c)}+1},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
[Out] integral(4*a^2*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^m*e^(4*I*d*x
 + 4*I*c)/(e^(4*I*d*x + 4*I*c) + 2*e^(2*I*d*x + 2*I*c) + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^2\,(e\sec(dx+c))^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
[Out] integrate((I*a*tan(d*x + c) + a)^2*(e*sec(d*x + c))^m, x)
```

maple [F] time = 1.17, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^m\,(a+ia\tan(dx+c))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] int((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^2\,(e\sec(dx+c))^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^2*(e*sec(d*x + c))^m, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(\frac{e}{\cos(c+d\,x)}\right)^m\,{\left(a+a\tan(c+d\,x)\,1{}\mathrm{i}\right)}^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] int((e/cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-a^2\left(\int \left(-(e\sec(c+dx))^m\right)dx+\int (e\sec(c+dx))^m\tan^2(c+dx)\,dx+\int \left(-2i\,(e\sec(c+dx))^m\tan(c+dx)\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**m*(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -a**2*(Integral(-(e*sec(c + d*x))**m, x) + Integral((e*sec(c + d*x))**m*tan
(c + d*x)**2, x) + Integral(-2*I*(e*sec(c + d*x))**m*tan(c + d*x), x))
```

3.453 $\int (e\sec(c+dx))^m(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=82

$$\frac{ia2^{\frac{m}{2}+1}(1+i\tan(c+dx))^{-m/2}(e\sec(c+dx))^m\,{}_2F_1\left(-\frac{m}{2},\frac{m}{2};\frac{m+2}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{dm}$$

```
[Out] I*2^(1+1/2*m)*a*hypergeom([1/2*m, -1/2*m],[1+1/2*m],1/2-1/2*I*tan(d*x+c))*(
e*sec(d*x+c))^m/d/m/((1+I*tan(d*x+c))^(1/2*m))
```

Rubi [A] time = 0.13, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {3505, 3523, 70, 69}

$$\frac{ia2^{\frac{m}{2}+1}(1+i\tan(c+dx))^{-m/2}(e\sec(c+dx))^m\text{Hypergeometric2F1}\left(-\frac{m}{2},\frac{m}{2},\frac{m+2}{2},\frac{1}{2}(1-i\tan(c+dx))\right)}{dm}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (I*2^(1 + m/2)*a*Hypergeometric2F1[-m/2, m/2, (2 + m)/2, (1 - I*Tan[c + d*x
])/2]*(e*Sec[c + d*x])^m)/(d*m*(1 + I*Tan[c + d*x])^(m/2))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^m(a+ia\tan(c+dx))\,dx = \left((e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)\int (a$$

$$= \frac{\left(a^2(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)\mathrm{Su}}{d}$$

$$= \frac{\left(2^{m/2}a^2(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{-m/2}\right)\mathrm{Su}}{d}$$

$$= \frac{i2^{1+\frac{m}{2}}a\,{}_2F_1\left(-\frac{m}{2},\frac{m}{2};\frac{2+m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx))^m(1+i\,\mathrm{ta}}{dm}$$

Mathematica [A] time = 0.68, size = 130, normalized size = 1.59

$$\frac{a2^{m+1}e^{i(c+2dx)}\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^m(\tan(c+dx)-i)(\cos(dx)-i\sin(dx))\,{}_2F_1\left(1,1-\frac{m}{2};\frac{m+4}{2};-e^{2i(c+dx)}\right)\sec^{-m-1}(c+dx)(e\,\mathrm{s}}{d(m+2)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (2^(1 + m)*a*E^(I*(c + 2*d*x))*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x))))^
m*Hypergeometric2F1[1, 1 - m/2, (4 + m)/2, -E^((2*I)*(c + d*x))]*Sec[c + d*
x]^(-1 - m)*(e*Sec[c + d*x])^m*(Cos[d*x] - I*Sin[d*x])*(-I + Tan[c + d*x]))
/(d*(2 + m))
```

fricas [F] time = 0.65, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{2\,a\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^m e^{(2i\,dx+2i\,c)}}{e^{(2i\,dx+2i\,c)}+1},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] integral(2*a*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^m*e^(2*I*d*x +
 2*I*c)/(e^(2*I*d*x + 2*I*c) + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)\,(e\sec(dx+c))^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)*(e*sec(d*x + c))^m, x)
```

maple [F] time = 1.43, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^m\,(a+ia\tan(dx+c))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c)),x)
```

```
[Out] int((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)\,(e\sec(dx+c))^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)*(e*sec(d*x + c))^m, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(\frac{e}{\cos(c+d\,x)}\right)^m\,\left(a+a\tan(c+d\,x)\,1\mathrm{i}\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^m*(a + a*tan(c + d*x)*1i),x)
```

```
[Out] int((e/cos(c + d*x))^m*(a + a*tan(c + d*x)*1i), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$ia\left(\int \left(-i\,(e\sec(c+dx))^m\right)dx+\int (e\sec(c+dx))^m\tan(c+dx)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**m*(a+I*a*tan(d*x+c)),x)
```

```
[Out] I*a*(Integral(-I*(e*sec(c + d*x))**m, x) + Integral((e*sec(c + d*x))**m*tan
(c + d*x), x))
```

3.454 $\int \frac{(e\sec(c+dx))^m}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=86

$$\frac{i2^{\frac{m}{2}-1}(1+i\tan(c+dx))^{-m/2}(e\sec(c+dx))^m\,{}_2F_1\left(2-\frac{m}{2},\frac{m}{2};\frac{m+2}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{adm}$$

```
[Out] I*2^(-1+1/2*m)*hypergeom([1/2*m, 2-1/2*m],[1+1/2*m],1/2-1/2*I*tan(d*x+c))*(
e*sec(d*x+c))^m/a/d/m/((1+I*tan(d*x+c))^(1/2*m))
```

Rubi [A] time = 0.15, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3505, 3523, 70, 69}

$$\frac{i2^{\frac{m}{2}-1}(1+i\tan(c+dx))^{-m/2}(e\sec(c+dx))^m\text{Hypergeometric2F1}\left(2-\frac{m}{2},\frac{m}{2},\frac{m+2}{2},\frac{1}{2}(1-i\tan(c+dx))\right)}{adm}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^m/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (I*2^(-1 + m/2)*Hypergeometric2F1[2 - m/2, m/2, (2 + m)/2, (1 - I*Tan[c + d
*x])/2]*(e*Sec[c + d*x])^m)/(a*d*m*(1 + I*Tan[c + d*x])^(m/2))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^m}{a+ia\tan(c+dx)}dx = \left((e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)\int(a-ia\tan(c+$$

$$= \frac{\left(a^2(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)\text{Subst}\left(\int(a-ia\right.}{d}$$

$$= \frac{\left(2^{-2+\frac{m}{2}}(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{-m/2}\right)\text{Subst}\left(\int\left(\frac{1}{2}+\right.\right.}{d}$$

$$= \frac{i2^{-1+\frac{m}{2}}\,{}_2F_1\left(2-\frac{m}{2},\frac{m}{2};\frac{2+m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx))^m(1+i\tan(c+dx))}{adm}$$

Mathematica [A] time = 0.70, size = 150, normalized size = 1.74

$$-\frac{i2^{m-1}e^{-i(c+2dx)}\left(1+e^{2i(c+dx)}\right)^2\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^m(\cos(dx)+i\sin(dx))\,{}_2F_1\left(1,1-\frac{m}{2};\frac{m}{2};-e^{2i(c+dx)}\right)\sec^{1-m}(c+dx)(e\,s}{d(m-2)(a+ia\tan(c+dx))}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Sec[c + d*x])^m/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((-I)*2^(-1 + m)*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x))))^m*(1 + E^((2*I
)*(c + d*x)))^2*Hypergeometric2F1[1, 1 - m/2, m/2, -E^((2*I)*(c + d*x))]*Se
c[c + d*x]^(1 - m)*(e*Sec[c + d*x])^m*(Cos[d*x] + I*Sin[d*x]))/(d*E^(I*(c +
 2*d*x))*(-2 + m)*(a + I*a*Tan[c + d*x]))
```

fricas [F] time = 0.52, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^m\left(e^{(2i\,dx+2i\,c)}+1\right)e^{(-2i\,dx-2i\,c)}}{2\,a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] integral(1/2*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^m*(e^(2*I*d*x
 + 2*I*c) + 1)*e^(-2*I*d*x - 2*I*c)/a, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^m}{i\,a\tan(dx+c)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^m/(I*a*tan(d*x + c) + a), x)
```

maple [F] time = 2.32, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^m}{a+ia\tan(dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c)),x)
```

```
[Out] int((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c)),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^m}{a+a\tan\left(c+d\,x\right)\,1\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^m/(a + a*tan(c + d*x)*1i),x)
```

```
[Out] int((e/cos(c + d*x))^m/(a + a*tan(c + d*x)*1i), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\int\frac{(e\sec{(c+dx)})^m}{\tan{(c+dx)}-i}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**m/(a+I*a*tan(d*x+c)),x)
```

```
[Out] -I*Integral((e*sec(c + d*x))**m/(tan(c + d*x) - I), x)/a
```

3.455 $\int \frac{(e\sec(c+dx))^m}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=86

$$\frac{i2^{\frac{m}{2}-2}(1+i\tan(c+dx))^{-m/2}(e\sec(c+dx))^m\,{}_2F_1\left(3-\frac{m}{2},\frac{m}{2};\frac{m+2}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{a^2dm}$$

```
[Out] I*2^(-2+1/2*m)*hypergeom([1/2*m, 3-1/2*m],[1+1/2*m],1/2-1/2*I*tan(d*x+c))*(
e*sec(d*x+c))^m/a^2/d/m/((1+I*tan(d*x+c))^(1/2*m))
```

Rubi [A] time = 0.16, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3505, 3523, 70, 69}

$$\frac{i2^{\frac{m}{2}-2}(1+i\tan(c+dx))^{-m/2}(e\sec(c+dx))^m\text{Hypergeometric2F1}\left(3-\frac{m}{2},\frac{m}{2},\frac{m+2}{2},\frac{1}{2}(1-i\tan(c+dx))\right)}{a^2dm}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^m/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (I*2^(-2 + m/2)*Hypergeometric2F1[3 - m/2, m/2, (2 + m)/2, (1 - I*Tan[c + d
*x])/2]*(e*Sec[c + d*x])^m)/(a^2*d*m*(1 + I*Tan[c + d*x])^(m/2))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^m}{(a+ia\tan(c+dx))^2}\,dx = \left((e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)\int (a-ia\tan(c+$$

$$= \frac{\left(a^2(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)\text{Subst}\left(\int (a-ia\right.}{d}$$

$$= \frac{\left(2^{-3+\frac{m}{2}}(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{-m/2}\right)\text{Subst}\left(\int \left(\frac{1}{2}+\frac{ix}{2}\right.\right.}{ad}$$

$$= \frac{i2^{-2+\frac{m}{2}}\,{}_2F_1\left(3-\frac{m}{2},\frac{m}{2};\frac{2+m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx))^m(1+i\tan(c+dx))^{-}}{a^2dm}$$

Mathematica [A] time = 21.12, size = 154, normalized size = 1.79

$$-\frac{i2^{m-2}e^{-2i(c+2dx)}\left(1+e^{2i(c+dx)}\right)^3\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^m(\cos(dx)+i\sin(dx))^2\,{}_2F_1\left(1,1-\frac{m}{2};\frac{m-2}{2};-e^{2i(c+dx)}\right)\sec^{2-m}(c+dx)(e}{d(m-4)(a+ia\tan(c+dx))^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Sec[c + d*x])^m/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] ((-I)*2^(-2 + m)*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x))))^m*(1 + E^((2*I
)*(c + d*x)))^3*Hypergeometric2F1[1, 1 - m/2, (-2 + m)/2, -E^((2*I)*(c + d*
x))]*Sec[c + d*x]^(2 - m)*(e*Sec[c + d*x])^m*(Cos[d*x] + I*Sin[d*x])^2)/(d*
E^((2*I)*(c + 2*d*x))*(-4 + m)*(a + I*a*Tan[c + d*x])^2)
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(\frac{2\,e e^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^m\left(e^{(4i\,dx+4i\,c)}+2\,e^{(2i\,dx+2i\,c)}+1\right)e^{(-4i\,dx-4i\,c)}}{4\,a^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] integral(1/4*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^m*(e^(4*I*d*x
 + 4*I*c) + 2*e^(2*I*d*x + 2*I*c) + 1)*e^(-4*I*d*x - 4*I*c)/a^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^m}{(i\,a\tan(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^m/(I*a*tan(d*x + c) + a)^2, x)
```

maple [F] time = 3.86, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^m}{(a+ia\tan(dx+c))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] int((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^m}{\left(a+a\tan\left(c+d\,x\right)\,1\mathrm{i}\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^m/(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] int((e/cos(c + d*x))^m/(a + a*tan(c + d*x)*1i)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{(e\sec(c+dx))^m}{\tan^2(c+dx)-2i\tan(c+dx)-1}\,dx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**m/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -Integral((e*sec(c + d*x))**m/(tan(c + d*x)**2 - 2*I*tan(c + d*x) - 1), x)/
a**2
```

3.456 $\int \frac{(e\sec(c+dx))^m}{(a+ia\tan(c+dx))^3}\,dx$

Optimal. Leaf size=86

$$\frac{i2^{\frac{m}{2}-3}(1+i\tan(c+dx))^{-m/2}(e\sec(c+dx))^m\,{}_2F_1\left(4-\frac{m}{2},\frac{m}{2};\frac{m+2}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{a^3dm}$$

```
[Out] I*2^(-3+1/2*m)*hypergeom([1/2*m, 4-1/2*m],[1+1/2*m],1/2-1/2*I*tan(d*x+c))*(
e*sec(d*x+c))^m/a^3/d/m/((1+I*tan(d*x+c))^(1/2*m))
```

Rubi [A] time = 0.16, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3505, 3523, 70, 69}

$$\frac{i2^{\frac{m}{2}-3}(1+i\tan(c+dx))^{-m/2}(e\sec(c+dx))^m\text{Hypergeometric2F1}\left(4-\frac{m}{2},\frac{m}{2},\frac{m+2}{2},\frac{1}{2}(1-i\tan(c+dx))\right)}{a^3dm}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^m/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (I*2^(-3 + m/2)*Hypergeometric2F1[4 - m/2, m/2, (2 + m)/2, (1 - I*Tan[c + d
*x])/2]*(e*Sec[c + d*x])^m)/(a^3*d*m*(1 + I*Tan[c + d*x])^(m/2))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^m}{(a+ia\tan(c+dx))^3}dx = \left((e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)\int (a-ia\tan(c$$

$$= \frac{\left(a^2(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)\text{Subst}\left(\int (a-\right.}{d}$$

$$= \frac{\left(2^{-4+\frac{m}{2}}(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{-m/2}\right)\text{Subst}\left(\int\left(\frac{1}{2}-\right.\right.}{a^2d}$$

$$= \frac{i2^{-3+\frac{m}{2}}\,{}_2F_1\left(4-\frac{m}{2},\frac{m}{2};\frac{2+m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx))^m(1+i\tan(c+dx)}{a^3dm}$$

Mathematica [A] time = 13.43, size = 151, normalized size = 1.76

$$\frac{2^{m-3}e^{-3i(c+2dx)}\left(1+e^{2i(c+dx)}\right)^4\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^m(\cos(dx)+i\sin(dx))^3\,{}_2F_1\left(1,1-\frac{m}{2};\frac{m-4}{2};-e^{2i(c+dx)}\right)\sec^{3-m}(c+dx)(e}{a^3d(m-6)(\tan(c+dx)-i)^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Sec[c + d*x])^m/(a + I*a*Tan[c + d*x])^3,x]
```

```
[Out] (2^(-3 + m)*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x))))^m*(1 + E^((2*I)*(c
+ d*x)))^4*Hypergeometric2F1[1, 1 - m/2, (-4 + m)/2, -E^((2*I)*(c + d*x))]*
Sec[c + d*x]^(3 - m)*(e*Sec[c + d*x])^m*(Cos[d*x] + I*Sin[d*x])^3)/(a^3*d*E
^((3*I)*(c + 2*d*x))*(-6 + m)*(-I + Tan[c + d*x])^3)
```

fricas [F] time = 0.78, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^m\left(e^{(6i\,dx+6i\,c)}+3\,e^{(4i\,dx+4i\,c)}+3\,e^{(2i\,dx+2i\,c)}+1\right)e^{(-6i\,dx-6i\,c)}}{8\,a^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] integral(1/8*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^m*(e^(6*I*d*x
+ 6*I*c) + 3*e^(4*I*d*x + 4*I*c) + 3*e^(2*I*d*x + 2*I*c) + 1)*e^(-6*I*d*x -
 6*I*c)/a^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^m}{(i\,a\tan(dx+c)+a)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^m/(I*a*tan(d*x + c) + a)^3, x)
```

maple [F] time = 4.49, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^m}{(a+ia\tan(dx+c))^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^3,x)
```

```
[Out] int((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^3,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^m}{\left(a+a\tan\left(c+d\,x\right)\,1\mathrm{i}\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^m/(a + a*tan(c + d*x)*1i)^3,x)
```

```
[Out] int((e/cos(c + d*x))^m/(a + a*tan(c + d*x)*1i)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{i\int\frac{\left(e\sec\left(c+dx\right)\right)^m}{\tan^3\left(c+dx\right)-3i\tan^2\left(c+dx\right)-3\tan\left(c+dx\right)+i}\,dx}{a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**m/(a+I*a*tan(d*x+c))**3,x)
```

```
[Out] I*Integral((e*sec(c + d*x))**m/(tan(c + d*x)**3 - 3*I*tan(c + d*x)**2 - 3*t
an(c + d*x) + I), x)/a**3
```

3.457 $\int (e\sec(c+dx))^m (a+ia\tan(c+dx))^{7/2}\,dx$

Optimal. Leaf size=109

$$\frac{ia^3 2^{\frac{m+7}{2}}\sqrt{a+ia\tan(c+dx)}\,(1+i\tan(c+dx))^{\frac{1}{2}(-m-1)}(e\sec(c+dx))^m\,{}_2F_1\left(\frac{1}{2}(-m-5),\frac{m}{2};\frac{m+2}{2};\frac{1}{2}(1-i\tan(c+dx\right.}{dm}$$

```
[Out] I*2^(7/2+1/2*m)*a^3*hypergeom([1/2*m, -5/2-1/2*m],[1+1/2*m],1/2-1/2*I*tan(d
*x+c))*(e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(1/2)*(1+I*tan(d*x+c))^(-1/2-1/2
*m)/d/m
```

Rubi [A] time = 0.21, antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3505, 3523, 70, 69}

$$\frac{ia^3 2^{\frac{m+7}{2}}\sqrt{a+ia\tan(c+dx)}\,(1+i\tan(c+dx))^{\frac{1}{2}(-m-1)}(e\sec(c+dx))^m\text{Hypergeometric2F1}\left(\frac{1}{2}(-m-5),\frac{m}{2},\frac{m+}{2}\right.}{dm}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] (I*2^((7 + m)/2)*a^3*Hypergeometric2F1[(-5 - m)/2, m/2, (2 + m)/2, (1 - I*T
an[c + d*x])/2]*(e*Sec[c + d*x])^m*(1 + I*Tan[c + d*x])^((-1 - m)/2)*Sqrt[a
 + I*a*Tan[c + d*x]])/(d*m)
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^m(a+ia\tan(c+dx))^{7/2}\,dx = \left((e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)\int$$

$$= \frac{\left(a^2(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)}{d}$$

$$= \frac{\left(2^{\frac{5}{2}+\frac{m}{2}}a^4(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}\sqrt{a+ia\tan(c+dx}\right.}{}$$

$$= \frac{i2^{\frac{7+m}{2}}a^3\,{}_2F_1\left(\frac{1}{2}(-5-m),\frac{m}{2};\frac{2+m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx}{dm}$$

Mathematica [A] time = 2.56, size = 178, normalized size = 1.63

$$-\frac{i2^{m+\frac{7}{2}}\sqrt{e^{idx}}\,e^{3i(c+2dx)}\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{m+\frac{1}{2}}(a+ia\tan(c+dx))^{7/2}\,{}_2F_1\left(1,1-\frac{m}{2};\frac{m+9}{2};-e^{2i(c+dx)}\right)\sec^{-m-\frac{7}{2}}(c+dx)(e\sec(c}{d(m+7)\left(1+e^{2i(c+dx)}\right)^2(\cos(dx)+i\sin(dx))^{7/2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x])^(7/2),x]
```

```
[Out] ((-I)*2^(7/2 + m)*E^((3*I)*(c + 2*d*x))*Sqrt[E^(I*d*x)]*(E^(I*(c + d*x))/(1
 + E^((2*I)*(c + d*x))))^(1/2 + m)*Hypergeometric2F1[1, 1 - m/2, (9 + m)/2,
 -E^((2*I)*(c + d*x))]*Sec[c + d*x]^(-7/2 - m)*(e*Sec[c + d*x])^m*(a + I*a*
Tan[c + d*x])^(7/2))/(d*(1 + E^((2*I)*(c + d*x)))^2*(7 + m)*(Cos[d*x] + I*S
in[d*x])^(7/2))
```

fricas [F] time = 1.51, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{8\sqrt{2}\,a^3\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^m\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\,e^{(7i\,dx+7i\,c)}}{e^{(6i\,dx+6i\,c)}+3\,e^{(4i\,dx+4i\,c)}+3\,e^{(2i\,dx+2i\,c)}+1},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] integral(8*sqrt(2)*a^3*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^m*sq
rt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(7*I*d*x + 7*I*c)/(e^(6*I*d*x + 6*I*c) +
3*e^(4*I*d*x + 4*I*c) + 3*e^(2*I*d*x + 2*I*c) + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{7}{2}}\,(e\sec(dx+c))^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(7/2)*(e*sec(d*x + c))^m, x)
```

maple [F] time = 1.27, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^m\,(a+ia\tan(dx+c))^{\frac{7}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(7/2),x)
```

```
[Out] int((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(7/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{7}{2}}\,(e\sec(dx+c))^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(7/2)*(e*sec(d*x + c))^m, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(\frac{e}{\cos(c+d\,x)}\right)^m\,(a+a\tan(c+d\,x)\,1\mathrm{i})^{7/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^(7/2),x)
```

```
[Out] int((e/cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^(7/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**m*(a+I*a*tan(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.458 $\int (e\sec(c+dx))^m (a+ia\tan(c+dx))^{5/2}\,dx$

Optimal. Leaf size=109

$$\frac{ia^2 2^{\frac{m+5}{2}}\sqrt{a+ia\tan(c+dx)}\,(1+i\tan(c+dx))^{\frac{1}{2}(-m-1)}(e\sec(c+dx))^m\,{}_2F_1\left(\frac{1}{2}(-m-3),\frac{m}{2};\frac{m+2}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{dm}$$

```
[Out] I*2^(5/2+1/2*m)*a^2*hypergeom([1/2*m, -3/2-1/2*m],[1+1/2*m],1/2-1/2*I*tan(d
*x+c))*(e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(1/2)*(1+I*tan(d*x+c))^(-1/2-1/2
*m)/d/m
```

Rubi [A] time = 0.20, antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {3505, 3523, 70, 69}

$$\frac{ia^2 2^{\frac{m+5}{2}}\sqrt{a+ia\tan(c+dx)}\,(1+i\tan(c+dx))^{\frac{1}{2}(-m-1)}(e\sec(c+dx))^m\,\text{Hypergeometric2F1}\left(\frac{1}{2}(-m-3),\frac{m}{2},\frac{m+2}{2},\frac{1}{2}\ldots\right)}{dm}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (I*2^((5 + m)/2)*a^2*Hypergeometric2F1[(-3 - m)/2, m/2, (2 + m)/2, (1 - I*T
an[c + d*x])/2]*(e*Sec[c + d*x])^m*(1 + I*Tan[c + d*x])^((-1 - m)/2)*Sqrt[a
 + I*a*Tan[c + d*x]])/(d*m)
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^m(a+ia\tan(c+dx))^{5/2}\,dx = \Big((e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}$$

$$= \frac{\big(a^2(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-}}{d}$$

$$= \frac{\Big(2^{\frac{3}{2}+\frac{m}{2}}a^3(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}\sqrt{a+ia\tan(c+}}{}$$

$$= \frac{i2^{\frac{5+m}{2}}a^2\,{}_2F_1\left(\frac{1}{2}(-3-m),\frac{m}{2};\frac{2+m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+}{dm}$$

Mathematica [A] time = 1.82, size = 163, normalized size = 1.50

$$-\frac{i2^{m+\frac{5}{2}}\sqrt{e^{idx}}\,e^{i(c+3dx)}\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{m+\frac{3}{2}}(a+ia\tan(c+dx))^{5/2}\,{}_2F_1\left(1,1-\frac{m}{2};\frac{m+7}{2};-e^{2i(c+dx)}\right)\sec^{-m-\frac{5}{2}}(c+dx)(e\sec}{d(m+5)(\cos(dx)+i\sin(dx))^{5/2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((-I)*2^(5/2 + m)*E^(I*(c + 3*d*x))*Sqrt[E^(I*d*x)]*(E^(I*(c + d*x))/(1 + E
^((2*I)*(c + d*x))))^(3/2 + m)*Hypergeometric2F1[1, 1 - m/2, (7 + m)/2, -E^
((2*I)*(c + d*x))]*Sec[c + d*x]^(-5/2 - m)*(e*Sec[c + d*x])^m*(a + I*a*Tan[
c + d*x])^(5/2))/(d*(5 + m)*(Cos[d*x] + I*Sin[d*x])^(5/2))
```

fricas [F] time = 0.85, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{4\sqrt{2}\,a^2\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^m\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\,e^{(5i\,dx+5i\,c)}}{e^{(4i\,dx+4i\,c)}+2\,e^{(2i\,dx+2i\,c)}+1},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] integral(4*sqrt(2)*a^2*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^m*sq
rt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(5*I*d*x + 5*I*c)/(e^(4*I*d*x + 4*I*c) +
2*e^(2*I*d*x + 2*I*c) + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{\frac{5}{2}}\,(e\sec(dx+c))^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(5/2)*(e*sec(d*x + c))^m, x)
```

maple [F] time = 1.21, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^m\,(a+ia\tan(dx+c))^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] int((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(5/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan\left(dx+c\right)+a)^{\frac{5}{2}}\left(e\sec\left(dx+c\right)\right)^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(5/2)*(e*sec(d*x + c))^m, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(\frac{e}{\cos\left(c+d\,x\right)}\right)}^m\,{\left(a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^(5/2),x)
```

```
[Out] int((e/cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**m*(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.459 $\int (e\sec(c+dx))^m(a+ia\tan(c+dx))^{3/2}\,dx$

Optimal. Leaf size=107

$$\frac{ia2^{\frac{m+3}{2}}\sqrt{a+ia\tan(c+dx)}\,(1+i\tan(c+dx))^{\frac{1}{2}(-m-1)}(e\sec(c+dx))^m\,{}_2F_1\left(\frac{1}{2}(-m-1),\frac{m}{2};\frac{m+2}{2};\frac{1}{2}(1-i\tan(c+dx\right.}{dm}$$

```
[Out] I*2^(3/2+1/2*m)*a*hypergeom([1/2*m, -1/2-1/2*m],[1+1/2*m],1/2-1/2*I*tan(d*x
+c))*(e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(1/2)*(1+I*tan(d*x+c))^(-1/2-1/2*m
)/d/m
```

Rubi [A] time = 0.20, antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3505, 3523, 70, 69}

$$\frac{ia2^{\frac{m+3}{2}}\sqrt{a+ia\tan(c+dx)}\,(1+i\tan(c+dx))^{\frac{1}{2}(-m-1)}(e\sec(c+dx))^m\text{Hypergeometric2F1}\left(\frac{1}{2}(-m-1),\frac{m}{2},\frac{m+2}{2}\right.}{dm}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (I*2^((3 + m)/2)*a*Hypergeometric2F1[(-1 - m)/2, m/2, (2 + m)/2, (1 - I*Tan
[c + d*x])/2]*(e*Sec[c + d*x])^m*(1 + I*Tan[c + d*x])^((-1 - m)/2)*Sqrt[a +
 I*a*Tan[c + d*x]])/(d*m)
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^m(a+ia\tan(c+dx))^{3/2}\,dx = \left((e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)\int$$
$$= \frac{\left(a^2(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)}{d}$$
$$= \frac{\left(2^{\frac{1}{2}+\frac{m}{2}}a^2(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}\sqrt{a+ia\tan(c+dx}\right.}{}$$
$$= \frac{i2^{\frac{3+m}{2}}a\,{}_2F_1\left(\frac{1}{2}(-1-m),\frac{m}{2};\frac{2+m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx))}{dm}$$

Mathematica [A] time = 1.14, size = 163, normalized size = 1.52

$$-\frac{i2^{m+\frac{3}{2}}\sqrt{e^{idx}}\,e^{i(c+2dx)}\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{m+\frac{1}{2}}(a+ia\tan(c+dx))^{3/2}\,{}_2F_1\left(1,1-\frac{m}{2};\frac{m+5}{2};-e^{2i(c+dx)}\right)\sec^{-m-\frac{3}{2}}(c+dx)(e\sec(c+}{d(m+3)(\cos(dx)+i\sin(dx))^{3/2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] ((-I)*2^(3/2 + m)*E^(I*(c + 2*d*x))*Sqrt[E^(I*d*x)]*(E^(I*(c + d*x))/(1 + E
^((2*I)*(c + d*x))))^(1/2 + m)*Hypergeometric2F1[1, 1 - m/2, (5 + m)/2, -E^
((2*I)*(c + d*x))]*Sec[c + d*x]^(-3/2 - m)*(e*Sec[c + d*x])^m*(a + I*a*Tan[
c + d*x])^(3/2))/(d*(3 + m)*(Cos[d*x] + I*Sin[d*x])^(3/2))
```

fricas [F] time = 0.62, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{2\sqrt{2}a\left(\frac{2ee^{(idx+ic)}}{e^{(2idx+2ic)}+1}\right)^m\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\,e^{(3idx+3ic)}}{e^{(2idx+2ic)}+1},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] integral(2*sqrt(2)*a*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^m*sqrt
(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(3*I*d*x + 3*I*c)/(e^(2*I*d*x + 2*I*c) + 1)
, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ia\tan(dx+c)+a)^{\frac{3}{2}}(e\sec(dx+c))^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^(3/2)*(e*sec(d*x + c))^m, x)
```

maple [F] time = 1.23, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^m(a+ia\tan(dx+c))^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(3/2),x)
[Out] int((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(3/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan (dx+c)+a)^{\frac{3}{2}}\,(e\sec (dx+c))^m\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate((I*a*tan(d*x + c) + a)^(3/2)*(e*sec(d*x + c))^m, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(\frac{e}{\cos \left(c+d\,x\right)}\right)}^m\,{\left(a+a\,\tan \left(c+d\,x\right)\,1{}\mathrm{i}\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^(3/2),x)
[Out] int((e/cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec (c+dx))^m\,(ia\,(\tan (c+dx)-i))^{\frac{3}{2}}\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**m*(a+I*a*tan(d*x+c))**(3/2),x)
[Out] Integral((e*sec(c + d*x))**m*(I*a*(tan(c + d*x) - I))**(3/2), x)
```

3.460 $\int (e\sec(c+dx))^m\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=107

$$\frac{ia2^{\frac{m+1}{2}}(1+i\tan(c+dx))^{\frac{1-m}{2}}(e\sec(c+dx))^m\,{}_2F_1\left(\frac{1-m}{2},\frac{m}{2};\frac{m+2}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{dm\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] I*2^(1/2+1/2*m)*a*hypergeom([1/2*m, 1/2-1/2*m],[1+1/2*m],1/2-1/2*I*tan(d*x+
c))*(e*sec(d*x+c))^m*(1+I*tan(d*x+c))^(1/2-1/2*m)/d/m/(a+I*a*tan(d*x+c))^(1
/2)
```

Rubi [A] time = 0.18, antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {3505, 3523, 70, 69}

$$\frac{ia2^{\frac{m+1}{2}}(1+i\tan(c+dx))^{\frac{1-m}{2}}(e\sec(c+dx))^m\text{Hypergeometric2F1}\left(\frac{1-m}{2},\frac{m}{2},\frac{m+2}{2},\frac{1}{2}(1-i\tan(c+dx))\right)}{dm\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^m*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (I*2^((1 + m)/2)*a*Hypergeometric2F1[(1 - m)/2, m/2, (2 + m)/2, (1 - I*Tan[
c + d*x])/2]*(e*Sec[c + d*x])^m*(1 + I*Tan[c + d*x])^((1 - m)/2))/(d*m*Sqrt
[a + I*a*Tan[c + d*x]])
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^m\sqrt{a+ia\tan(c+dx)}\,dx = \Big((e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\Big)$$

$$= \frac{\Big(a^2(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}}{d}$$

$$= \frac{\Big(2^{-\frac{1}{2}+\frac{m}{2}}a^2(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{\frac{1}{2}}}{d\sqrt{a+ia\tan(}}$$

$$= \frac{i2^{\frac{1+m}{2}}a\,{}_2F_1\left(\frac{1-m}{2},\frac{m}{2};\frac{2+m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx))^m(1+}{dm\sqrt{a+ia\tan(c+dx)}}$$

Mathematica [A] time = 0.73, size = 162, normalized size = 1.51

$$-\frac{i2^{m+\frac{1}{2}}\sqrt{e^{idx}}\,e^{i(c+dx)}\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{m-\frac{1}{2}}\sqrt{a+ia\tan(c+dx)}\,{}_2F_1\left(1,1-\frac{m}{2};\frac{m+3}{2};-e^{2i(c+dx)}\right)\sec^{-m-\frac{1}{2}}(c+dx)(e\sec(c}{d(m+1)\sqrt{\cos(dx)+i\sin(dx)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Sec[c + d*x])^m*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((-I)*2^(1/2 + m)*E^(I*(c + d*x))*Sqrt[E^(I*d*x)]*(E^(I*(c + d*x))/(1 + E^(
(2*I)*(c + d*x))))^(-1/2 + m)*Hypergeometric2F1[1, 1 - m/2, (3 + m)/2, -E^(
(2*I)*(c + d*x))]*Sec[c + d*x]^(-1/2 - m)*(e*Sec[c + d*x])^m*Sqrt[a + I*a*T
an[c + d*x]])/(d*(1 + m)*Sqrt[Cos[d*x] + I*Sin[d*x]])
```

fricas [F] time = 0.57, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{2}\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^m\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\,e^{(i\,dx+i\,c)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(2)*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^m*sqrt(a/(
e^(2*I*d*x + 2*I*c) + 1))*e^(I*d*x + I*c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{i\,a\tan(dx+c)+a}\,(e\sec(dx+c))^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)*(e*sec(d*x + c))^m, x)
```

maple [F] time = 1.51, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^m\sqrt{a+ia\tan(dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] int((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{i\,a\tan\left(dx+c\right)+a}\,\left(e\sec\left(dx+c\right)\right)^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)*(e*sec(d*x + c))^m, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(\frac{e}{\cos\left(c+d\,x\right)}\right)}^m\,\sqrt{a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^(1/2),x)
[Out] int((e/cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(e\sec\left(c+dx\right)\right)^{m}\sqrt{ia\left(\tan\left(c+dx\right)-i\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**m*(a+I*a*tan(d*x+c))**(1/2),x)
[Out] Integral((e*sec(c + d*x))**m*sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.461 $\int \frac{(e\sec(c+dx))^m}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=106

$$\frac{i2^{\frac{m-1}{2}}(1+i\tan(c+dx))^{\frac{1-m}{2}}(e\sec(c+dx))^m\,{}_2F_1\left(\frac{3-m}{2},\frac{m}{2};\frac{m+2}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{dm\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] I*2^(-1/2+1/2*m)*hypergeom([1/2*m, 3/2-1/2*m],[1+1/2*m],1/2-1/2*I*tan(d*x+c
))*(e*sec(d*x+c))^m*(1+I*tan(d*x+c))^(1/2-1/2*m)/d/m/(a+I*a*tan(d*x+c))^(1/
2)
```

Rubi [A] time = 0.19, antiderivative size = 106, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3505, 3523, 70, 69}

$$\frac{i2^{\frac{m-1}{2}}(1+i\tan(c+dx))^{\frac{1-m}{2}}(e\sec(c+dx))^m\text{Hypergeometric2F1}\left(\frac{3-m}{2},\frac{m}{2},\frac{m+2}{2},\frac{1}{2}(1-i\tan(c+dx))\right)}{dm\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^m/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (I*2^((-1 + m)/2)*Hypergeometric2F1[(3 - m)/2, m/2, (2 + m)/2, (1 - I*Tan[c
 + d*x])/2]*(e*Sec[c + d*x])^m*(1 + I*Tan[c + d*x])^((1 - m)/2))/(d*m*Sqrt[
a + I*a*Tan[c + d*x]])
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^m}{\sqrt{a+ia\tan(c+dx)}}\,dx = \left((e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)\int (a-ia\tan(c+$$

$$= \frac{\left(a^2(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)\text{Subst}\left(\int (a-ia\right.}{d}$$

$$= \frac{\left(2^{-\frac{3}{2}+\frac{m}{2}}a(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{\frac{1}{2}-\frac{m}{2}}\right)\text{Subst}\left(\int\left(\frac{1}{2}+\right.\right.}{d\sqrt{a+ia\tan(c+dx)}}$$

$$= \frac{i2^{\frac{1}{2}(-1+m)}\,{}_2F_1\left(\frac{3-m}{2},\frac{m}{2};\frac{2+m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx))^m(1+i\tan(c+dx))^{\frac{1}{}}}{dm\sqrt{a+ia\tan(c+dx)}}$$

Mathematica [A] time = 1.20, size = 162, normalized size = 1.53

$$-\frac{i2^{m-\frac{1}{2}}e^{i(c+dx)}\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{m-\frac{3}{2}}\sqrt{\cos(dx)+i\sin(dx)}\,{}_2F_1\left(1,1-\frac{m}{2};\frac{m+1}{2};-e^{2i(c+dx)}\right)\sec^{\frac{1}{2}-m}(c+dx)(e\sec(c+dx))^m}{d(m-1)\sqrt{e^{idx}}\sqrt{a+ia\tan(c+dx)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Sec[c + d*x])^m/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((-I)*2^(-1/2 + m)*E^(I*(c + d*x))*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x)
)))^(-3/2 + m)*Hypergeometric2F1[1, 1 - m/2, (1 + m)/2, -E^((2*I)*(c + d*x)
)]*Sec[c + d*x]^(1/2 - m)*(e*Sec[c + d*x])^m*Sqrt[Cos[d*x] + I*Sin[d*x]])/(
d*Sqrt[E^(I*d*x)]*(-1 + m)*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{2}\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^m\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(e^{(2i\,dx+2i\,c)}+1\right)e^{(-i\,dx-i\,c)}}{2\,a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] integral(1/2*sqrt(2)*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^m*sqrt
(a/(e^(2*I*d*x + 2*I*c) + 1))*(e^(2*I*d*x + 2*I*c) + 1)*e^(-I*d*x - I*c)/a,
 x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^m}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^m/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [F] time = 1.18, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^m}{\sqrt{a+ia\tan(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] int((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^m}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((e*sec(d*x + c))^m/sqrt(I*a*tan(d*x + c) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^m}{\sqrt{a+a\tan(c+d\,x)\,1\mathrm{i}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^m/(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] int((e/cos(c + d*x))^m/(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(c+dx))^m}{\sqrt{ia(\tan(c+dx)-i)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**m/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral((e*sec(c + d*x))**m/sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.462 $\int \frac{(e\sec(c+dx))^m}{(a+ia\tan(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=109

$$\frac{i2^{\frac{m-3}{2}}(1+i\tan(c+dx))^{\frac{1-m}{2}}(e\sec(c+dx))^m\,{}_2F_1\left(\frac{5-m}{2},\frac{m}{2};\frac{m+2}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{adm\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] I*2^(-3/2+1/2*m)*hypergeom([1/2*m, 5/2-1/2*m],[1+1/2*m],1/2-1/2*I*tan(d*x+c
))*(e*sec(d*x+c))^m*(1+I*tan(d*x+c))^(1/2-1/2*m)/a/d/m/(a+I*a*tan(d*x+c))^(
1/2)
```

Rubi [A] time = 0.21, antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {3505, 3523, 70, 69}

$$\frac{i2^{\frac{m-3}{2}}(1+i\tan(c+dx))^{\frac{1-m}{2}}(e\sec(c+dx))^m\text{Hypergeometric2F1}\left(\frac{5-m}{2},\frac{m}{2},\frac{m+2}{2},\frac{1}{2}(1-i\tan(c+dx))\right)}{adm\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^m/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] (I*2^((-3 + m)/2)*Hypergeometric2F1[(5 - m)/2, m/2, (2 + m)/2, (1 - I*Tan[c
 + d*x])/2]*(e*Sec[c + d*x])^m*(1 + I*Tan[c + d*x])^((1 - m)/2))/(a*d*m*Sqr
t[a + I*a*Tan[c + d*x]])
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^m}{(a+ia\tan(c+dx))^{3/2}}\,dx = \left((e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)\int(a-ia\tan($$

$$= \frac{\left(a^2(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)\text{Subst}\left(\int(a\right.}{d}$$

$$= \frac{\left(2^{-\frac{5}{2}+\frac{m}{2}}(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{\frac{1}{2}-\frac{m}{2}}\right)\text{Subst}\left(\int\left(\frac{1}{2}\right.\right.}{d\sqrt{a+ia\tan(c+dx)}}$$

$$= \frac{i2^{\frac{1}{2}(-3+m)}\,{}_2F_1\left(\frac{5-m}{2},\frac{m}{2};\frac{2+m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx))^m(1+i\tan(c+}{adm\sqrt{a+ia\tan(c+dx)}}$$

Mathematica [A] time = 1.66, size = 178, normalized size = 1.63

$$-\frac{i2^{m-\frac{3}{2}}\sqrt{e^{idx}}\,e^{-2i(c+2dx)}\left(1+e^{2i(c+dx)}\right)^3\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{m+\frac{1}{2}}(\cos(dx)+i\sin(dx))^{3/2}\,{}_2F_1\left(1,1-\frac{m}{2};\frac{m-1}{2};-e^{2i(c+dx)}\right)\sec^{\frac{3}{2}}}{d(m-3)(a+ia\tan(c+dx))^{3/2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Sec[c + d*x])^m/(a + I*a*Tan[c + d*x])^(3/2),x]
```

```
[Out] ((-I)*2^(-3/2 + m)*Sqrt[E^(I*d*x)]*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x)
)))^(1/2 + m)*(1 + E^((2*I)*(c + d*x)))^3*Hypergeometric2F1[1, 1 - m/2, (-1
 + m)/2, -E^((2*I)*(c + d*x))]*Sec[c + d*x]^(3/2 - m)*(e*Sec[c + d*x])^m*(C
os[d*x] + I*Sin[d*x])^(3/2))/(d*E^((2*I)*(c + 2*d*x))*(-3 + m)*(a + I*a*Tan
[c + d*x])^(3/2))
```

fricas [F] time = 0.57, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{2}\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^m\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(e^{(4i\,dx+4i\,c)}+2\,e^{(2i\,dx+2i\,c)}+1\right)e^{(-3i\,dx-3i\,c)}}{4\,a^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] integral(1/4*sqrt(2)*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^m*sqrt
(a/(e^(2*I*d*x + 2*I*c) + 1))*(e^(4*I*d*x + 4*I*c) + 2*e^(2*I*d*x + 2*I*c)
+ 1)*e^(-3*I*d*x - 3*I*c)/a^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^m}{(i\,a\tan(dx+c)+a)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^m/(I*a*tan(d*x + c) + a)^(3/2), x)
```

maple [F] time = 1.12, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^m}{(a+ia\tan(dx+c))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^(3/2),x)
```

```
[Out] int((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^(3/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e \sec (dx+c))^m}{(i a \tan (dx+c)+a)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((e*sec(d*x + c))^m/(I*a*tan(d*x + c) + a)^(3/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^m}{(a+a\tan(c+d\,x)\,1\mathrm{i})^{3/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^m/(a + a*tan(c + d*x)*1i)^(3/2),x)
```

```
[Out] int((e/cos(c + d*x))^m/(a + a*tan(c + d*x)*1i)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e \sec (c+dx))^m}{(ia (\tan (c+dx)-i))^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**m/(a+I*a*tan(d*x+c))**(3/2),x)
```

```
[Out] Integral((e*sec(c + d*x))**m/(I*a*(tan(c + d*x) - I))**(3/2), x)
```

3.463 $\int \frac{(e\sec(c+dx))^m}{(a+ia\tan(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=109

$$\frac{i2^{\frac{m-5}{2}}(1+i\tan(c+dx))^{\frac{1-m}{2}}(e\sec(c+dx))^m\,{}_2F_1\left(\frac{7-m}{2},\frac{m}{2};\frac{m+2}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{a^2dm\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] I*2^(-5/2+1/2*m)*hypergeom([1/2*m, 7/2-1/2*m],[1+1/2*m],1/2-1/2*I*tan(d*x+c
))*(e*sec(d*x+c))^m*(1+I*tan(d*x+c))^(1/2-1/2*m)/a^2/d/m/(a+I*a*tan(d*x+c))
^(1/2)
```

Rubi [A] time = 0.21, antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3505, 3523, 70, 69}

$$\frac{i2^{\frac{m-5}{2}}(1+i\tan(c+dx))^{\frac{1-m}{2}}(e\sec(c+dx))^m\text{Hypergeometric2F1}\left(\frac{7-m}{2},\frac{m}{2},\frac{m+2}{2},\frac{1}{2}(1-i\tan(c+dx))\right)}{a^2dm\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^m/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] (I*2^((-5 + m)/2)*Hypergeometric2F1[(7 - m)/2, m/2, (2 + m)/2, (1 - I*Tan[c
 + d*x])/2]*(e*Sec[c + d*x])^m*(1 + I*Tan[c + d*x])^((1 - m)/2))/(a^2*d*m*S
qrt[a + I*a*Tan[c + d*x]])
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(e\sec(c+dx))^m}{(a+ia\tan(c+dx))^{5/2}}\,dx = \left((e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)\int (a-ia\tan(c+$$

$$= \frac{\left(a^2(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)\text{Subst}\left(\int (a-\right.}{d}$$

$$= \frac{\left(2^{-\frac{7}{2}+\frac{m}{2}}(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{\frac{1}{2}-\frac{m}{2}}\right)\text{Subst}\left(\int \left(\frac{1}{2}+\right.\right.}{ad\sqrt{a+ia\tan(c+dx)}}$$

$$= \frac{i2^{\frac{1}{2}(-5+m)}\,{}_2F_1\left(\frac{7-m}{2},\frac{m}{2};\frac{2+m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx))^m(1+i\tan(c+dx)}{a^2dm\sqrt{a+ia\tan(c+dx)}}$$

Mathematica [A] time = 3.29, size = 178, normalized size = 1.63

$$-\frac{i2^{m-\frac{5}{2}}\sqrt{e^{idx}}\,e^{-3i(c+2dx)}\left(1+e^{2i(c+dx)}\right)^4\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{m+\frac{1}{2}}(\cos(dx)+i\sin(dx))^{5/2}\,{}_2F_1\left(1,1-\frac{m}{2};\frac{m-3}{2};-e^{2i(c+dx)}\right)\sec^{\frac{5}{2}-m}}{d(m-5)(a+ia\tan(c+dx))^{5/2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Sec[c + d*x])^m/(a + I*a*Tan[c + d*x])^(5/2),x]
```

```
[Out] ((-I)*2^(-5/2 + m)*Sqrt[E^(I*d*x)]*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x)
)))^(1/2 + m)*(1 + E^((2*I)*(c + d*x)))^4*Hypergeometric2F1[1, 1 - m/2, (-3
 + m)/2, -E^((2*I)*(c + d*x))]*Sec[c + d*x]^(5/2 - m)*(e*Sec[c + d*x])^m*(C
os[d*x] + I*Sin[d*x])^(5/2))/(d*E^((3*I)*(c + 2*d*x))*(-5 + m)*(a + I*a*Tan
[c + d*x])^(5/2))
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{2}\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^m\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(e^{(6i\,dx+6i\,c)}+3\,e^{(4i\,dx+4i\,c)}+3\,e^{(2i\,dx+2i\,c)}+1\right)e^{(-5i\,dx-5i\,c)}}{8\,a^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] integral(1/8*sqrt(2)*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^m*sqrt
(a/(e^(2*I*d*x + 2*I*c) + 1))*(e^(6*I*d*x + 6*I*c) + 3*e^(4*I*d*x + 4*I*c)
+ 3*e^(2*I*d*x + 2*I*c) + 1)*e^(-5*I*d*x - 5*I*c)/a^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^m}{(i\,a\tan(dx+c)+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^m/(I*a*tan(d*x + c) + a)^(5/2), x)
```

maple [F] time = 1.14, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^m}{(a+ia\tan(dx+c))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^(5/2),x)
```

```
[Out] int((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^(5/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(dx+c))^m}{(i\,a\tan(dx+c)+a)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m/(a+I*a*tan(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((e*sec(d*x + c))^m/(I*a*tan(d*x + c) + a)^(5/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{e}{\cos(c+d\,x)}\right)^m}{(a+a\tan(c+d\,x)\,1\mathrm{i})^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^m/(a + a*tan(c + d*x)*1i)^(5/2),x)
```

```
[Out] int((e/cos(c + d*x))^m/(a + a*tan(c + d*x)*1i)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\sec(c+dx))^m}{(ia(\tan(c+dx)-i))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**m/(a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Integral((e*sec(c + d*x))**m/(I*a*(tan(c + d*x) - I))**(5/2), x)
```

3.464 $\int (e\sec(c+dx))^m(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=105

$$\frac{i2^{\frac{m}{2}+n}(a+ia\tan(c+dx))^n(e\sec(c+dx))^m(1+i\tan(c+dx))^{-\frac{m}{2}-n}\,{}_2F_1\left(\frac{m}{2},-\frac{m}{2}-n+1;\frac{m+2}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{dm}$$

```
[Out] I*2^(1/2*m+n)*hypergeom([1/2*m, 1-1/2*m-n],[1+1/2*m],1/2-1/2*I*tan(d*x+c))*
(e*sec(d*x+c))^m*(1+I*tan(d*x+c))^(-1/2*m-n)*(a+I*a*tan(d*x+c))^n/d/m
```

Rubi [A] time = 0.15, antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3505, 3523, 70, 69}

$$\frac{i2^{\frac{m}{2}+n}(a+ia\tan(c+dx))^n(e\sec(c+dx))^m(1+i\tan(c+dx))^{-\frac{m}{2}-n}\text{Hypergeometric2F1}\left(\frac{m}{2},-\frac{m}{2}-n+1,\frac{m+2}{2},\frac{1}{2}(1\right.}{dm}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] (I*2^(m/2 + n)*Hypergeometric2F1[m/2, 1 - m/2 - n, (2 + m)/2, (1 - I*Tan[c
+ d*x])/2]*(e*Sec[c + d*x])^m*(1 + I*Tan[c + d*x])^(-m/2 - n)*(a + I*a*Tan[
c + d*x])^n)/(d*m)
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^m(a+ia\tan(c+dx))^n\,dx = \left((e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/2}\right)$$

$$= \frac{\left(a^2(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+dx))^{-m/}\right.}{d}$$

$$= \frac{\left(2^{-1+\frac{m}{2}+n}a(e\sec(c+dx))^m(a-ia\tan(c+dx))^{-m/2}(a+ia\tan(c+\right.}{}$$

$$= \frac{i2^{\frac{m}{2}+n}\,{}_2F_1\left(\frac{m}{2},1-\frac{m}{2}-n;\frac{2+m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx)}{dm}$$

Mathematica [A] time = 9.00, size = 159, normalized size = 1.51

$$-\frac{i2^{m+n}\left(1+e^{2i(c+dx)}\right)\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{m+n}(\cos(dx)+i\sin(dx))^{-n}(a+ia\tan(c+dx))^n(e\sec(c+dx))^m\,{}_2F_1\left(1,\right.}{d(m+2n)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Sec[c + d*x])^m*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(m + n)*(E^(I*d*x))^n*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x))))^(
m + n)*(1 + E^((2*I)*(c + d*x)))*Hypergeometric2F1[1, 1 - m/2, 1 + m/2 + n,
 -E^((2*I)*(c + d*x))]*Sec[c + d*x]^(-m - n)*(e*Sec[c + d*x])^m*(a + I*a*Ta
n[c + d*x])^n)/(d*(m + 2*n)*(Cos[d*x] + I*Sin[d*x])^n)
```

fricas [F] time = 0.92, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^m e^{\left(i\,dnx+i\,cn+n\log\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)+n\log\left(\frac{a}{e}\right)\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral((2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^m*e^(I*d*n*x + I*c
*n + n*log(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1)) + n*log(a/e)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^m\,(i\,a\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^m*(I*a*tan(d*x + c) + a)^n, x)
```

maple [F] time = 1.86, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^m\,(a+ia\tan(dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^m (i\,a\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^m*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
[Out] integrate((e*sec(d*x + c))^m*(I*a*tan(d*x + c) + a)^n, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(\frac{e}{\cos(c+d\,x)}\right)^m (a+a\tan(c+d\,x)\,1\mathrm{i})^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^n,x)
[Out] int((e/cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^n, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(c+dx))^m (ia(\tan(c+dx)-i))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**m*(a+I*a*tan(d*x+c))**n,x)
[Out] Integral((e*sec(c + d*x))**m*(I*a*(tan(c + d*x) - I))**n, x)
```

3.465 $\int \sec^6(c+dx)(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=97

$$-\frac{i(a+ia\tan(c+dx))^{n+5}}{a^5d(n+5)}+\frac{4i(a+ia\tan(c+dx))^{n+4}}{a^4d(n+4)}-\frac{4i(a+ia\tan(c+dx))^{n+3}}{a^3d(n+3)}$$

```
[Out] -4*I*(a+I*a*tan(d*x+c))^(3+n)/a^3/d/(3+n)+4*I*(a+I*a*tan(d*x+c))^(4+n)/a^4/
d/(4+n)-I*(a+I*a*tan(d*x+c))^(5+n)/a^5/d/(5+n)
```

Rubi [A] time = 0.07, antiderivative size = 97, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$-\frac{4i(a+ia\tan(c+dx))^{n+3}}{a^3d(n+3)}+\frac{4i(a+ia\tan(c+dx))^{n+4}}{a^4d(n+4)}-\frac{i(a+ia\tan(c+dx))^{n+5}}{a^5d(n+5)}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-4*I)*(a + I*a*Tan[c + d*x])^(3 + n))/(a^3*d*(3 + n)) + ((4*I)*(a + I*a*T
an[c + d*x])^(4 + n))/(a^4*d*(4 + n)) - (I*(a + I*a*Tan[c + d*x])^(5 + n))/
(a^5*d*(5 + n))
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^6(c+dx)(a+ia\tan(c+dx))^n\,dx &= -\frac{i\,\text{Subst}\left(\int (a-x)^2(a+x)^{2+n}\,dx,x,ia\tan(c+dx)\right)}{a^5d}\\ &= -\frac{i\,\text{Subst}\left(\int \left(4a^2(a+x)^{2+n}-4a(a+x)^{3+n}+(a+x)^{4+n}\right)dx,x,ia\tan(c+dx)\right)}{a^5d}\\ &= -\frac{4i(a+ia\tan(c+dx))^{3+n}}{a^3d(3+n)}+\frac{4i(a+ia\tan(c+dx))^{4+n}}{a^4d(4+n)}-\frac{i(a+ia\tan(c+dx))^{5+n}}{a^5d(5+n)}\end{aligned}$$

Mathematica [A] time = 14.22, size = 171, normalized size = 1.76

$$-\frac{i2^{n+5}e^{6i(c+dx)}\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^n\left(2(n+5)e^{2i(c+dx)}+2e^{4i(c+dx)}+n^2+9n+20\right)\sec^{-n}(c+dx)(\cos(dx)+i\sin(dx))^{-n}(a+ia\tan(c+dx))^n}{d(n+3)(n+4)(n+5)\left(1+e^{2i(c+dx)}\right)^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(5 + n)*E^((6*I)*(c + d*x))*(E^(I*d*x))^n*(E^(I*(c + d*x))/(1 + E^(
(2*I)*(c + d*x))))^n*(20 + 2*E^((4*I)*(c + d*x)) + 9*n + n^2 + 2*E^((2*I)*(
c + d*x))*(5 + n))*(a + I*a*Tan[c + d*x])^n)/(d*(1 + E^((2*I)*(c + d*x)))^5
*(3 + n)*(4 + n)*(5 + n)*Sec[c + d*x]^n*(Cos[d*x] + I*Sin[d*x])^n)
```

fricas [B] time = 0.52, size = 245, normalized size = 2.53

$$\frac{\left(\left(-64 i n-320 i\right) e^{\left(8 i dx+8 i c\right)}+\left(-32 i\right.\right.}{dn^3+12\, dn^2+47\, dn+\left(dn^3+12\, dn^2+47\, dn+60\, d\right) e^{\left(10 i dx+10 i c\right)}+5 \left(dn^3+12\, dn^2+47\, dn+60\, d\right) e^{\left(8 i dx+8 i c\right)}+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] ((-64*I*n - 320*I)*e^(8*I*d*x + 8*I*c) + (-32*I*n^2 - 288*I*n - 640*I)*e^(6
*I*d*x + 6*I*c) - 64*I*e^(10*I*d*x + 10*I*c))*(2*a*e^(2*I*d*x + 2*I*c)/(e^(
2*I*d*x + 2*I*c) + 1))^n/(d*n^3 + 12*d*n^2 + 47*d*n + (d*n^3 + 12*d*n^2 + 4
7*d*n + 60*d)*e^(10*I*d*x + 10*I*c) + 5*(d*n^3 + 12*d*n^2 + 47*d*n + 60*d)*
e^(8*I*d*x + 8*I*c) + 10*(d*n^3 + 12*d*n^2 + 47*d*n + 60*d)*e^(6*I*d*x + 6*
I*c) + 10*(d*n^3 + 12*d*n^2 + 47*d*n + 60*d)*e^(4*I*d*x + 4*I*c) + 5*(d*n^3
 + 12*d*n^2 + 47*d*n + 60*d)*e^(2*I*d*x + 2*I*c) + 60*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(i\, a \tan\left(dx+c\right)+a\right)^{n} \sec\left(dx+c\right)^{6}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*sec(d*x + c)^6, x)
```

maple [C] time = 1.51, size = 3316, normalized size = 34.19

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] -32*I/(exp(2*I*(d*x+c))+1)^5/(n+4)/(5+n)/d/(3+n)*(2*2^n*a^n/((exp(2*I*(d*x+
c))+1)^n)*(exp(I*(Re(d*x)+Re(c)))^n)^2*exp(-2*n*Im(d*x)-2*n*Im(c))*exp(-1/2
*I*csgn(I*exp(2*I*(d*x+c)))^3*Pi*n)*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c))/(exp
(2*I*(d*x+c))+1))^3*Pi*n)*exp(I*csgn(I*exp(2*I*(d*x+c)))^2*csgn(I*exp(I*(d*
x+c)))*Pi*n)*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(
I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))*csgn(I*a)*Pi*n)*exp(-1/2*I*csgn(
I*exp(2*I*(d*x+c)))*csgn(I*exp(I*(d*x+c)))^2*Pi*n)*exp(10*I*d*x)*exp(-1/2*I
*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^3*Pi*n)*exp(-1/2*I*csgn(I*
exp(2*I*(d*x+c)))*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I/(exp
(2*I*(d*x+c))+1))*Pi*n)*exp(1/2*I*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*
x+c)))^2*csgn(I*a)*Pi*n)*exp(1/2*I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c)
)+1))*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*Pi*n)*exp(1/2*I*csg
n(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*csgn(I/(exp(2*I*(d*x+c))+1))*P
i*n)*exp(1/2*I*csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d
*x+c))+1))^2*Pi*n)*exp(10*I*c)+2*n*2^n*a^n/((exp(2*I*(d*x+c))+1)^n)*(exp(I*
(Re(d*x)+Re(c)))^n)^2*exp(-2*n*Im(d*x)-2*n*Im(c))*exp(-1/2*I*csgn(I*exp(2*I
*(d*x+c)))^3*Pi*n)*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))
^3*Pi*n)*exp(I*csgn(I*exp(2*I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c)))*Pi*n)*exp(
-1/2*I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x
```

```
+c))+1)*exp(2*I*(d*x+c)))*csgn(I*a)*Pi*n)*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c)
))*csgn(I*exp(I*(d*x+c)))^2*Pi*n)*exp(8*I*d*x)*exp(-1/2*I*csgn(I*a/(exp(2*I
*(d*x+c))+1)*exp(2*I*(d*x+c)))^3*Pi*n)*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c)))*
csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I/(exp(2*I*(d*x+c))+1))*
Pi*n)*exp(1/2*I*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*csgn(I*a)
*Pi*n)*exp(1/2*I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(ex
p(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*Pi*n)*exp(1/2*I*csgn(I*exp(2*I*(d*x+c
))/(exp(2*I*(d*x+c))+1))^2*csgn(I/(exp(2*I*(d*x+c))+1))*Pi*n)*exp(1/2*I*csg
n(I*exp(2*I*(d*x+c)))*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*Pi*n)
*exp(8*I*c)+n^2*2^n*a^n/((exp(2*I*(d*x+c))+1)^n)*(exp(I*(Re(d*x)+Re(c)))^n)
^2*exp(-2*n*Im(d*x)-2*n*Im(c))*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c)))^3*Pi*n)*
exp(-1/2*I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^3*Pi*n)*exp(I*csgn
(I*exp(2*I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c)))*Pi*n)*exp(-1/2*I*csgn(I*exp(2
*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*
x+c)))*csgn(I*a)*Pi*n)*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(I*(d*
x+c)))^2*Pi*n)*exp(6*I*d*x)*exp(-1/2*I*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*
I*(d*x+c)))^3*Pi*n)*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(2*I*(d*x
+c))/(exp(2*I*(d*x+c))+1))*csgn(I/(exp(2*I*(d*x+c))+1))*Pi*n)*exp(1/2*I*csg
n(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*csgn(I*a)*Pi*n)*exp(1/2*I*cs
gn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c))+1)*e
xp(2*I*(d*x+c)))^2*Pi*n)*exp(1/2*I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c)
)+1))^2*csgn(I/(exp(2*I*(d*x+c))+1))*Pi*n)*exp(1/2*I*csgn(I*exp(2*I*(d*x+c)
))*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*Pi*n)*exp(6*I*c)+10*2^n*
a^n/((exp(2*I*(d*x+c))+1)^n)*(exp(I*(Re(d*x)+Re(c)))^n)^2*exp(-2*n*Im(d*x)-
2*n*Im(c))*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c)))^3*Pi*n)*exp(-1/2*I*csgn(I*ex
p(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^3*Pi*n)*exp(I*csgn(I*exp(2*I*(d*x+c)))
^2*csgn(I*exp(I*(d*x+c)))*Pi*n)*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I
*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))*csgn(I*a)*Pi*
n)*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(I*(d*x+c)))^2*Pi*n)*exp(8
*I*d*x)*exp(-1/2*I*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^3*Pi*n)*
exp(-1/2*I*csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c
))+1))*csgn(I/(exp(2*I*(d*x+c))+1))*Pi*n)*exp(1/2*I*csgn(I*a/(exp(2*I*(d*x+
c))+1)*exp(2*I*(d*x+c)))^2*csgn(I*a)*Pi*n)*exp(1/2*I*csgn(I*exp(2*I*(d*x+c)
)/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*P
i*n)*exp(1/2*I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*csgn(I/(exp(
2*I*(d*x+c))+1))*Pi*n)*exp(1/2*I*csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(2*I*(d
*x+c))/(exp(2*I*(d*x+c))+1))^2*Pi*n)*exp(8*I*c)+9*n*2^n*a^n/((exp(2*I*(d*x+
c))+1)^n)*(exp(I*(Re(d*x)+Re(c)))^n)^2*exp(-2*n*Im(d*x)-2*n*Im(c))*exp(-1/2
*I*csgn(I*exp(2*I*(d*x+c)))^3*Pi*n)*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c))/(exp
(2*I*(d*x+c))+1))^3*Pi*n)*exp(I*csgn(I*exp(2*I*(d*x+c)))^2*csgn(I*exp(I*(d*
x+c)))*Pi*n)*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(
I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))*csgn(I*a)*Pi*n)*exp(-1/2*I*csgn(
I*exp(2*I*(d*x+c)))*csgn(I*exp(I*(d*x+c)))^2*Pi*n)*exp(6*I*d*x)*exp(-1/2*I*
csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^3*Pi*n)*exp(-1/2*I*csgn(I*e
xp(2*I*(d*x+c)))*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I/(exp(
2*I*(d*x+c))+1))*Pi*n)*exp(1/2*I*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x
+c)))^2*csgn(I*a)*Pi*n)*exp(1/2*I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))
+1))*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*Pi*n)*exp(1/2*I*csgn
(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*csgn(I/(exp(2*I*(d*x+c))+1))*Pi
*n)*exp(1/2*I*csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*
x+c))+1))^2*Pi*n)*exp(6*I*c)+20*2^n*a^n/((exp(2*I*(d*x+c))+1)^n)*(exp(I*(Re
(d*x)+Re(c)))^n)^2*exp(-2*n*Im(d*x)-2*n*Im(c))*exp(-1/2*I*csgn(I*exp(2*I*(d
*x+c)))^3*Pi*n)*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^3*
Pi*n)*exp(I*csgn(I*exp(2*I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c)))*Pi*n)*exp(-1/
2*I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c)
)+1)*exp(2*I*(d*x+c)))*csgn(I*a)*Pi*n)*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c)))*
csgn(I*exp(I*(d*x+c)))^2*Pi*n)*exp(6*I*d*x)*exp(-1/2*I*csgn(I*a/(exp(2*I*(d
*x+c))+1)*exp(2*I*(d*x+c)))^3*Pi*n)*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c)))*csg
n(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I/(exp(2*I*(d*x+c))+1))*Pi*
```

```
n)*exp(1/2*I*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*csgn(I*a)*Pi
*n)*exp(1/2*I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2
*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*Pi*n)*exp(1/2*I*csgn(I*exp(2*I*(d*x+c))/
(exp(2*I*(d*x+c))+1))^2*csgn(I/(exp(2*I*(d*x+c))+1))*Pi*n)*exp(1/2*I*csgn(I
*exp(2*I*(d*x+c)))*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*Pi*n)*ex
p(6*I*c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^n \sec(dx+c)^6\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*sec(d*x + c)^6, x)
```

mupad [B] time = 8.13, size = 168, normalized size = 1.73

$$\frac{\mathrm{e}^{-c\,5\mathrm{i}-d\,x\,5\mathrm{i}}\left(a+\frac{a\,\sin(c+d\,x)\,1\mathrm{i}}{\cos(c+d\,x)}\right)^n\left(\frac{64\,\mathrm{e}^{c\,10\mathrm{i}+d\,x\,10\mathrm{i}}}{d\left(n^3\,1\mathrm{i}+n^2\,12\mathrm{i}+n\,47\mathrm{i}+60\mathrm{i}\right)}+\frac{\mathrm{e}^{c\,6\mathrm{i}+d\,x\,6\mathrm{i}}\left(32\,n^2+288\,n+640\right)}{d\left(n^3\,1\mathrm{i}+n^2\,12\mathrm{i}+n\,47\mathrm{i}+60\mathrm{i}\right)}+\frac{\mathrm{e}^{c\,8\mathrm{i}+d\,x\,8\mathrm{i}}\,(64\,n+320)}{d\left(n^3\,1\mathrm{i}+n^2\,12\mathrm{i}+n\,47\mathrm{i}+60\mathrm{i}\right)}\right)}{32\cos\left(c+d\,x\right)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^n/cos(c + d*x)^6,x)
```

```
[Out] (exp(- c*5i - d*x*5i)*(a + (a*sin(c + d*x)*1i)/cos(c + d*x))^n*((64*exp(c*1
0i + d*x*10i))/(d*(n*47i + n^2*12i + n^3*1i + 60i)) + (exp(c*6i + d*x*6i)*(
288*n + 32*n^2 + 640))/(d*(n*47i + n^2*12i + n^3*1i + 60i)) + (exp(c*8i + d
*x*8i)*(64*n + 320))/(d*(n*47i + n^2*12i + n^3*1i + 60i))))/(32*cos(c + d*x
)^5)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ia(\tan(c+dx)-i))^n \sec^6(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Integral((I*a*(tan(c + d*x) - I))**n*sec(c + d*x)**6, x)
```

3.466 $\int \sec^4(c+dx)(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=65

$$\frac{i(a+ia\tan(c+dx))^{n+3}}{a^3d(n+3)}-\frac{2i(a+ia\tan(c+dx))^{n+2}}{a^2d(n+2)}$$

```
[Out] -2*I*(a+I*a*tan(d*x+c))^(2+n)/a^2/d/(2+n)+I*(a+I*a*tan(d*x+c))^(3+n)/a^3/d/
(3+n)
```

Rubi [A] time = 0.06, antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 43}

$$\frac{i(a+ia\tan(c+dx))^{n+3}}{a^3d(n+3)}-\frac{2i(a+ia\tan(c+dx))^{n+2}}{a^2d(n+2)}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-2*I)*(a + I*a*Tan[c + d*x])^(2 + n))/(a^2*d*(2 + n)) + (I*(a + I*a*Tan[c
 + d*x])^(3 + n))/(a^3*d*(3 + n))
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^4(c+dx)(a+ia\tan(c+dx))^n\,dx&=-\frac{i\,\text{Subst}\left(\int(a-x)(a+x)^{1+n}\,dx,x,ia\tan(c+dx)\right)}{a^3d}\\&=-\frac{i\,\text{Subst}\left(\int\left(2a(a+x)^{1+n}-(a+x)^{2+n}\right)dx,x,ia\tan(c+dx)\right)}{a^3d}\\&=-\frac{2i(a+ia\tan(c+dx))^{2+n}}{a^2d(2+n)}+\frac{i(a+ia\tan(c+dx))^{3+n}}{a^3d(3+n)}\end{aligned}$$

Mathematica [B] time = 13.53, size = 143, normalized size = 2.20

$$-\frac{i2^{n+3}e^{4i(c+dx)}\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^n\left(e^{2i(c+dx)}+n+3\right)\sec^{-n}(c+dx)(\cos(dx)+i\sin(dx))^{-n}(a+ia\tan(c+dx))^n}{d(n+2)(n+3)\left(1+e^{2i(c+dx)}\right)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(3 + n)*E^((4*I)*(c + d*x))*(E^(I*d*x))^n*(E^(I*(c + d*x))/(1 + E^(
(2*I)*(c + d*x))))^n*(3 + E^((2*I)*(c + d*x)) + n)*(a + I*a*Tan[c + d*x])^n
)/(d*(1 + E^((2*I)*(c + d*x)))^3*(2 + n)*(3 + n)*Sec[c + d*x]^n*(Cos[d*x] +
 I*Sin[d*x])^n)
```

fricas [B] time = 0.69, size = 141, normalized size = 2.17

$$\frac{\left((-8i\,n-24i)e^{(4i\,dx+4i\,c)}-8i\,e^{(6i\,dx+6i\,c)}\right)\left(\frac{2\,ae^{(2i\,dx+2i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^n}{dn^2+5\,dn+\left(dn^2+5\,dn+6\,d\right)e^{(6i\,dx+6i\,c)}+3\left(dn^2+5\,dn+6\,d\right)e^{(4i\,dx+4i\,c)}+3\left(dn^2+5\,dn+6\,d\right)e^{(2i\,dx+2i\,c)}+6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] ((-8*I*n - 24*I)*e^(4*I*d*x + 4*I*c) - 8*I*e^(6*I*d*x + 6*I*c))*(2*a*e^(2*I
*d*x + 2*I*c)/(e^(2*I*d*x + 2*I*c) + 1))^n/(d*n^2 + 5*d*n + (d*n^2 + 5*d*n
+ 6*d)*e^(6*I*d*x + 6*I*c) + 3*(d*n^2 + 5*d*n + 6*d)*e^(4*I*d*x + 4*I*c) +
3*(d*n^2 + 5*d*n + 6*d)*e^(2*I*d*x + 2*I*c) + 6*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(i\,a\tan\left(dx+c\right)+a\right)^n\sec\left(dx+c\right)^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*sec(d*x + c)^4, x)
```

maple [C] time = 0.92, size = 1668, normalized size = 25.66

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] -8*I/(exp(2*I*(d*x+c))+1)^3/(3+n)/d/(2+n)*(2^n*a^n/((exp(2*I*(d*x+c))+1)^n)
*(exp(I*(Re(d*x)+Re(c)))^n)^2*exp(-2*n*Im(d*x)-2*n*Im(c))*exp(-1/2*I*csgn(I
*exp(2*I*(d*x+c)))^3*Pi*n)*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x
+c))+1))^3*Pi*n)*exp(I*csgn(I*exp(2*I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c)))*Pi
*n)*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(
2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))*csgn(I*a)*Pi*n)*exp(-1/2*I*csgn(I*exp(2*I
*(d*x+c)))*csgn(I*exp(I*(d*x+c)))^2*Pi*n)*exp(6*I*d*x)*exp(-1/2*I*csgn(I*a/
(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^3*Pi*n)*exp(-1/2*I*csgn(I*exp(2*I*(d
*x+c)))*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I/(exp(2*I*(d*x+
c))+1))*Pi*n)*exp(1/2*I*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*c
sgn(I*a)*Pi*n)*exp(1/2*I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn
(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*Pi*n)*exp(1/2*I*csgn(I*exp(2*
I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*csgn(I/(exp(2*I*(d*x+c))+1))*Pi*n)*exp(1
/2*I*csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))
^2*Pi*n)*exp(6*I*c)+n/((exp(2*I*(d*x+c))+1)^n)*(exp(I*(Re(d*x)+Re(c)))^n)^2
*a^n*2^n*exp(-2*n*Im(d*x)-2*n*Im(c))*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c)))*cs
gn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I/(exp(2*I*(d*x+c))+1))*Pi
*n)*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(
2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))*csgn(I*a)*Pi*n)*exp(1/2*I*csgn(I*a/(exp(2
*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*csgn(I*a)*Pi*n)*exp(4*I*d*x)*exp(I*csgn(
I*exp(2*I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c)))*Pi*n)*exp(1/2*I*csgn(I*exp(2*I
*(d*x+c)))*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*Pi*n)*exp(-1/2*I
*csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(I*(d*x+c)))^2*Pi*n)*exp(1/2*I*csgn(I*e
```

```
xp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*csgn(I/(exp(2*I*(d*x+c))+1))*Pi*n)*
exp(-1/2*I*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^3*Pi*n)*exp(1/2*
I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c))+
1)*exp(2*I*(d*x+c)))^2*Pi*n)*exp(4*I*c)*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c)))
^3*Pi*n)*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^3*Pi*n)+3
/((exp(2*I*(d*x+c))+1)^n)*(exp(I*(Re(d*x)+Re(c)))^n)^2*a^n*2^n*exp(-2*n*Im(
d*x)-2*n*Im(c))*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(2*I*(d*x+c))
/(exp(2*I*(d*x+c))+1))*csgn(I/(exp(2*I*(d*x+c))+1))*Pi*n)*exp(-1/2*I*csgn(I
*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2
*I*(d*x+c)))*csgn(I*a)*Pi*n)*exp(1/2*I*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*
I*(d*x+c)))^2*csgn(I*a)*Pi*n)*exp(4*I*d*x)*exp(I*csgn(I*exp(2*I*(d*x+c)))^2
*csgn(I*exp(I*(d*x+c)))*Pi*n)*exp(1/2*I*csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp
(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*Pi*n)*exp(-1/2*I*csgn(I*exp(2*I*(d*x+
c)))*csgn(I*exp(I*(d*x+c)))^2*Pi*n)*exp(1/2*I*csgn(I*exp(2*I*(d*x+c))/(exp(
2*I*(d*x+c))+1))^2*csgn(I/(exp(2*I*(d*x+c))+1))*Pi*n)*exp(-1/2*I*csgn(I*a/(
exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^3*Pi*n)*exp(1/2*I*csgn(I*exp(2*I*(d*x
+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^
2*Pi*n)*exp(4*I*c)*exp(-1/2*I*csgn(I*exp(2*I*(d*x+c)))^3*Pi*n)*exp(-1/2*I*c
sgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^3*Pi*n))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^n\sec(dx+c)^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*sec(d*x + c)^4, x)
```

mupad [B] time = 2.44, size = 216, normalized size = 3.32

$$-\frac{4\left(\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}\right)^n\,(n\,3\mathrm{i}+\cos(2\,c+2\,d\,x)\,15\mathrm{i}+\cos(4\,c+4\,d\,x)\,6\mathrm{i}+\cos(6\,c+6\,d\,x)\,1\mathrm{i}-9}{d\,\left(n^2+5\,n+6\right)\,(15}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^n/cos(c + d*x)^4,x)
```

```
[Out] -(4*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1
))^n*(n*3i + cos(2*c + 2*d*x)*15i + cos(4*c + 4*d*x)*6i + cos(6*c + 6*d*x)*
1i - 9*sin(2*c + 2*d*x) - 6*sin(4*c + 4*d*x) - sin(6*c + 6*d*x) + n*cos(2*c
 + 2*d*x)*4i + n*cos(4*c + 4*d*x)*1i - 2*n*sin(2*c + 2*d*x) - n*sin(4*c + 4
*d*x) + 10i))/(d*(5*n + n^2 + 6)*(15*cos(2*c + 2*d*x) + 6*cos(4*c + 4*d*x)
+ cos(6*c + 6*d*x) + 10))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ia(\tan(c+dx)-i))^n\sec^4(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Integral((I*a*(tan(c + d*x) - I))**n*sec(c + d*x)**4, x)
```

3.467 $\int \sec^2(c+dx)(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=32

$$-\frac{i(a+ia\tan(c+dx))^{n+1}}{ad(n+1)}$$

```
[Out] -I*(a+I*a*tan(d*x+c))^(1+n)/a/d/(1+n)
```

Rubi [A] time = 0.05, antiderivative size = 32, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {3487, 32}

$$-\frac{i(a+ia\tan(c+dx))^{n+1}}{ad(n+1)}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*(a + I*a*Tan[c + d*x])^(1 + n))/(a*d*(1 + n))
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^2(c+dx)(a+ia\tan(c+dx))^n\,dx &= -\frac{i\,\text{Subst}\left(\int (a+x)^n\,dx, x, ia\tan(c+dx)\right)}{ad}\\ &= -\frac{i(a+ia\tan(c+dx))^{1+n}}{ad(1+n)}\end{aligned}$$

Mathematica [B] time = 13.05, size = 111, normalized size = 3.47

$$-\frac{i2^{n+1}e^{i(c+dx)}\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{n+1}\sec^{-n}(c+dx)(\cos(dx)+i\sin(dx))^{-n}(a+ia\tan(c+dx))^n}{d(n+1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(1 + n)*E^(I*(c + d*x))*(E^(I*d*x))^n*(E^(I*(c + d*x))/(1 + E^((2*I
)*(c + d*x))))^(1 + n)*(a + I*a*Tan[c + d*x])^n)/(d*(1 + n)*Sec[c + d*x]^n*
(Cos[d*x] + I*Sin[d*x])^n)
```

fricas [B] time = 0.70, size = 60, normalized size = 1.88

$$-\frac{2i\left(\frac{2\,ae^{(2i\,dx+2i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^n e^{(2i\,dx+2i\,c)}}{dn+(dn+d)e^{(2i\,dx+2i\,c)}+d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] -2*I*(2*a*e^(2*I*d*x + 2*I*c)/(e^(2*I*d*x + 2*I*c) + 1))^n*e^(2*I*d*x + 2*I
*c)/(d*n + (d*n + d)*e^(2*I*d*x + 2*I*c) + d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^n\sec(dx+c)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*sec(d*x + c)^2, x)
```

maple [A] time = 0.13, size = 31, normalized size = 0.97

$$-\frac{i(a+ia\tan(dx+c))^{1+n}}{ad(1+n)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] -I*(a+I*a*tan(d*x+c))^(1+n)/a/d/(1+n)
```

maxima [A] time = 0.38, size = 28, normalized size = 0.88

$$-\frac{i(i\,a\tan(dx+c)+a)^{n+1}}{ad(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] -I*(I*a*tan(d*x + c) + a)^(n + 1)/(a*d*(n + 1))
```

mupad [B] time = 0.42, size = 104, normalized size = 3.25

$$\frac{2\,\left(\cos(2\,d\,x)+\sin(2\,d\,x)\,1\mathrm{i}\right)\,\left(\cos(2\,c)+\sin(2\,c)\,1\mathrm{i}\right)\,{\left(\frac{a\,\left(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i}\right)}{\cos(2\,c+2\,d\,x)+1}\right)}^n}{d\,\left(n+1\right)\,\left(\cos(2\,c+2\,d\,x)\,1\mathrm{i}-\sin(2\,c+2\,d\,x)+1\mathrm{i}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^n/cos(c + d*x)^2,x)
```

```
[Out] (2*(cos(2*d*x) + sin(2*d*x)*1i)*(cos(2*c) + sin(2*c)*1i)*((a*(cos(2*c + 2*d
*x) + sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1))^n)/(d*(n + 1)*(cos(
2*c + 2*d*x)*1i - sin(2*c + 2*d*x) + 1i))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ia(\tan(c+dx)-i))^n\sec^2(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Integral((I*a*(tan(c + d*x) - I))**n*sec(c + d*x)**2, x)
```

3.468 $\int \cos^2(c+dx)(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=56

$$\frac{ia(a+ia\tan(c+dx))^{n-1}\,{}_2F_1\left(2,n-1;n;\frac{1}{2}(i\tan(c+dx)+1)\right)}{4d(1-n)}$$

```
[Out] 1/4*I*a*hypergeom([2, -1+n],[n],1/2+1/2*I*tan(d*x+c))*(a+I*a*tan(d*x+c))^(-
1+n)/d/(1-n)
```

Rubi [A] time = 0.06, antiderivative size = 56, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = $\{3487, 68\}$

$$\frac{ia(a+ia\tan(c+dx))^{n-1}\text{Hypergeometric2F1}\left(2,n-1,n,\frac{1}{2}(1+i\tan(c+dx))\right)}{4d(1-n)}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((I/4)*a*Hypergeometric2F1[2, -1 + n, n, (1 + I*Tan[c + d*x])/2]*(a + I*a*T
an[c + d*x])^(-1 + n))/(d*(1 - n))
```

Rule 68

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a
+ b*x))/(b*c - a*d))])/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]
 && NeQ[b*c - a*d, 0] &&  !IntegerQ[m] && IntegerQ[n]
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \cos^2(c+dx)(a+ia\tan(c+dx))^n\,dx &= -\frac{\left(ia^3\right)\text{Subst}\left(\int \frac{(a+x)^{-2+n}}{(a-x)^2}\,dx,x,ia\tan(c+dx)\right)}{d}\\ &= \frac{ia\,{}_2F_1\left(2,-1+n;n;\frac{1}{2}(1+i\tan(c+dx))\right)(a+ia\tan(c+dx))^{-1+n}}{4d(1-n)}\end{aligned}$$

Mathematica [B] time = 13.29, size = 141, normalized size = 2.52

$$-\frac{i2^{n-3}e^{-2i(c+dx)}\left(1+e^{2i(c+dx)}\right)^3\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^n\,{}_2F_1\left(1,2;n;-e^{2i(c+dx)}\right)\sec^{-n}(c+dx)(\cos(dx)+i\sin(dx))^{-n}(a+}{d(n-1)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Cos[c + d*x]^2*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(-3 + n)*(E^(I*d*x))^n*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x))))^
n*(1 + E^((2*I)*(c + d*x)))^3*Hypergeometric2F1[1, 2, n, -E^((2*I)*(c + d*x
))]*(a + I*a*Tan[c + d*x])^n)/(d*E^((2*I)*(c + d*x))*(-1 + n)*Sec[c + d*x]^
n*(Cos[d*x] + I*Sin[d*x])^n)
```

fricas [F] time = 1.05, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{4}\left(\frac{2\,ae^{(2i\,dx+2i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^{n}\left(e^{(4i\,dx+4i\,c)}+2\,e^{(2i\,dx+2i\,c)}+1\right)e^{(-2i\,dx-2i\,c)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral(1/4*(2*a*e^(2*I*d*x + 2*I*c)/(e^(2*I*d*x + 2*I*c) + 1))^n*(e^(4*I*
d*x + 4*I*c) + 2*e^(2*I*d*x + 2*I*c) + 1)*e^(-2*I*d*x - 2*I*c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{n}\cos(dx+c)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*cos(d*x + c)^2, x)
```

maple [F] time = 4.39, size = 0, normalized size = 0.00

$$\int \left(\cos^{2}(dx+c)\right)(a+ia\tan(dx+c))^{n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{n}\cos(dx+c)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*cos(d*x + c)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \cos(c+d\,x)^{2}\,(a+a\tan(c+d\,x)\,1\mathrm{i})^{n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^n,x)
```

```
[Out] int(cos(c + d*x)^2*(a + a*tan(c + d*x)*1i)^n, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ia(\tan(c+dx)-i))^{n}\cos^{2}(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Integral((I*a*(tan(c + d*x) - I))**n*cos(c + d*x)**2, x)
```

3.469 $\int \cos^4(c+dx)(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=60

$$\frac{ia^2(a+ia\tan(c+dx))^{n-2}\,{}_2F_1\left(3,n-2;n-1;\frac{1}{2}(i\tan(c+dx)+1)\right)}{8d(2-n)}$$

```
[Out] 1/8*I*a^2*hypergeom([3, -2+n],[-1+n],1/2+1/2*I*tan(d*x+c))*(a+I*a*tan(d*x+c
))^(-2+n)/d/(2-n)
```

Rubi [A] time = 0.06, antiderivative size = 60, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.083$, Rules used = {3487, 68}

$$\frac{ia^2(a+ia\tan(c+dx))^{n-2}\text{Hypergeometric2F1}\left(3,n-2,n-1,\frac{1}{2}(1+i\tan(c+dx))\right)}{8d(2-n)}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((I/8)*a^2*Hypergeometric2F1[3, -2 + n, -1 + n, (1 + I*Tan[c + d*x])/2]*(a
+ I*a*Tan[c + d*x])^(-2 + n))/(d*(2 - n))
```

Rule 68

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a
+ b*x))/(b*c - a*d))])/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]
 && NeQ[b*c - a*d, 0] &&  !IntegerQ[m] && IntegerQ[n]
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \cos^4(c+dx)(a+ia\tan(c+dx))^n\,dx &= -\frac{\left(ia^5\right)\text{Subst}\left(\int \frac{(a+x)^{-3+n}}{(a-x)^3}\,dx,x,ia\tan(c+dx)\right)}{d}\\ &= \frac{ia^2\,{}_2F_1\left(3,-2+n;-1+n;\frac{1}{2}(1+i\tan(c+dx))\right)(a+ia\tan(c+dx))^{-2+n}}{8d(2-n)}\end{aligned}$$

Mathematica [B] time = 4.44, size = 143, normalized size = 2.38

$$-\frac{i2^{n-5}e^{-4i(c+dx)}\left(1+e^{2i(c+dx)}\right)^5\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^n{}_2F_1\left(1,3;n-1;-e^{2i(c+dx)}\right)\sec^{-n}(c+dx)(\cos(dx)+i\sin(dx))^{-n}(}{d(n-2)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Cos[c + d*x]^4*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(-5 + n)*(E^(I*d*x))^n*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x))))^
n*(1 + E^((2*I)*(c + d*x)))^5*Hypergeometric2F1[1, 3, -1 + n, -E^((2*I)*(c
+ d*x))]*(a + I*a*Tan[c + d*x])^n)/(d*E^((4*I)*(c + d*x))*(-2 + n)*Sec[c +
d*x]^n*(Cos[d*x] + I*Sin[d*x])^n)
```

fricas [F] time = 1.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{16}\left(\frac{2\,ae^{(2i\,dx+2i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^{n}\left(e^{(8i\,dx+8i\,c)}+4\,e^{(6i\,dx+6i\,c)}+6\,e^{(4i\,dx+4i\,c)}+4\,e^{(2i\,dx+2i\,c)}+1\right)e^{(-4i\,dx-4i\,c)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral(1/16*(2*a*e^(2*I*d*x + 2*I*c)/(e^(2*I*d*x + 2*I*c) + 1))^n*(e^(8*I
*d*x + 8*I*c) + 4*e^(6*I*d*x + 6*I*c) + 6*e^(4*I*d*x + 4*I*c) + 4*e^(2*I*d*
x + 2*I*c) + 1)*e^(-4*I*d*x - 4*I*c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{n}\cos(dx+c)^{4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*cos(d*x + c)^4, x)
```

maple [F] time = 3.68, size = 0, normalized size = 0.00

$$\int \left(\cos^{4}(dx+c)\right)(a+ia\tan(dx+c))^{n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^{n}\cos(dx+c)^{4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*cos(d*x + c)^4, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \cos(c+d\,x)^{4}\,(a+a\tan(c+d\,x)\,1\mathrm{i})^{n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^n,x)
```

```
[Out] int(cos(c + d*x)^4*(a + a*tan(c + d*x)*1i)^n, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ia(\tan(c+dx)-i))^{n}\cos^{4}(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Integral((I*a*(tan(c + d*x) - I))**n*cos(c + d*x)**4, x)
```

3.470 $\int \cos^6(c+dx)(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=60

$$\frac{ia^3(a+ia\tan(c+dx))^{n-3}\,{}_2F_1\left(4,n-3;n-2;\frac{1}{2}(i\tan(c+dx)+1)\right)}{16d(3-n)}$$

```
[Out] 1/16*I*a^3*hypergeom([4, -3+n],[-2+n],1/2+1/2*I*tan(d*x+c))*(a+I*a*tan(d*x+
c))^(-3+n)/d/(3-n)
```

Rubi [A] time = 0.05, antiderivative size = 60, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.083, Rules used = {3487, 68}

$$\frac{ia^3(a+ia\tan(c+dx))^{n-3}\text{Hypergeometric2F1}\left(4,n-3,n-2,\frac{1}{2}(1+i\tan(c+dx))\right)}{16d(3-n)}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^6*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((I/16)*a^3*Hypergeometric2F1[4, -3 + n, -2 + n, (1 + I*Tan[c + d*x])/2]*(a
 + I*a*Tan[c + d*x])^(-3 + n))/(d*(3 - n))
```

Rule 68

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a
+ b*x))/(b*c - a*d))])/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]
 && NeQ[b*c - a*d, 0] &&  !IntegerQ[m] && IntegerQ[n]
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \cos^6(c+dx)(a+ia\tan(c+dx))^n\,dx &= -\frac{\left(ia^7\right)\text{Subst}\left(\int \frac{(a+x)^{-4+n}}{(a-x)^4}\,dx,x,ia\tan(c+dx)\right)}{d}\\ &= \frac{ia^3\,{}_2F_1\left(4,-3+n;-2+n;\frac{1}{2}(1+i\tan(c+dx))\right)(a+ia\tan(c+dx))^{-}}{16d(3-n)}\end{aligned}$$

Mathematica [B] time = 5.83, size = 143, normalized size = 2.38

$$-\frac{i2^{n-7}e^{-6i(c+dx)}\left(1+e^{2i(c+dx)}\right)^7\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^n{}_2F_1\left(1,4;n-2;-e^{2i(c+dx)}\right)\sec^{-n}(c+dx)(\cos(dx)+i\sin(dx)}{d(n-3)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Cos[c + d*x]^6*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(-7 + n)*(E^(I*d*x))^n*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x))))^
n*(1 + E^((2*I)*(c + d*x)))^7*Hypergeometric2F1[1, 4, -2 + n, -E^((2*I)*(c
+ d*x))]*(a + I*a*Tan[c + d*x])^n)/(d*E^((6*I)*(c + d*x))*(-3 + n)*Sec[c +
d*x]^n*(Cos[d*x] + I*Sin[d*x])^n)
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{1}{64}\left(\frac{2\,ae^{(2i\,dx+2i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^n\left(e^{(12i\,dx+12i\,c)}+6\,e^{(10i\,dx+10i\,c)}+15\,e^{(8i\,dx+8i\,c)}+20\,e^{(6i\,dx+6i\,c)}+15\,e^{(4i\,dx+4i\,c)}+6\,e^{(2i\,c}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral(1/64*(2*a*e^(2*I*d*x + 2*I*c)/(e^(2*I*d*x + 2*I*c) + 1))^n*(e^(12*
I*d*x + 12*I*c) + 6*e^(10*I*d*x + 10*I*c) + 15*e^(8*I*d*x + 8*I*c) + 20*e^(
6*I*d*x + 6*I*c) + 15*e^(4*I*d*x + 4*I*c) + 6*e^(2*I*d*x + 2*I*c) + 1)*e^(-
6*I*d*x - 6*I*c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^n\cos(dx+c)^6\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*cos(d*x + c)^6, x)
```

maple [F] time = 3.69, size = 0, normalized size = 0.00

$$\int \left(\cos^6(dx+c)\right)(a+ia\tan(dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^n\cos(dx+c)^6\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^6*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*cos(d*x + c)^6, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \cos(c+d\,x)^6\,(a+a\tan(c+d\,x)\,1\mathrm{i})^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^n,x)
```

```
[Out] int(cos(c + d*x)^6*(a + a*tan(c + d*x)*1i)^n, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**6*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Timed out
```

3.471 $\int \sec^5(c+dx)(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=94

$$\frac{ia^2 2^{n+\frac{5}{2}}\sec^5(c+dx)(1+i\tan(c+dx))^{-n-\frac{1}{2}}(a+ia\tan(c+dx))^{n-2}\,{}_2F_1\left(\frac{5}{2},-n-\frac{3}{2};\frac{7}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{5d}$$

```
[Out] 1/5*I*2^(5/2+n)*a^2*hypergeom([5/2, -3/2-n],[7/2],1/2-1/2*I*tan(d*x+c))*sec
(d*x+c)^5*(1+I*tan(d*x+c))^(-1/2-n)*(a+I*a*tan(d*x+c))^(-2+n)/d
```

Rubi [A] time = 0.19, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {3505, 3523, 70, 69}

$$\frac{ia^2 2^{n+\frac{5}{2}}\sec^5(c+dx)(1+i\tan(c+dx))^{-n-\frac{1}{2}}(a+ia\tan(c+dx))^{n-2}\text{Hypergeometric2F1}\left(\frac{5}{2},-n-\frac{3}{2},\frac{7}{2},\frac{1}{2}(1-i\tan\right.}{5d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^5*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((I/5)*2^(5/2 + n)*a^2*Hypergeometric2F1[5/2, -3/2 - n, 7/2, (1 - I*Tan[c +
 d*x])/2]*Sec[c + d*x]^5*(1 + I*Tan[c + d*x])^(-1/2 - n)*(a + I*a*Tan[c + d
*x])^(-2 + n))/d
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \sec^5(c+dx)(a+ia\tan(c+dx))^n\,dx = \frac{\sec^5(c+dx)\int (a-ia\tan(c+dx))^{5/2}(a+ia\tan(c+dx))^{\frac{5}{2}+n}\,dx}{(a-ia\tan(c+dx))^{5/2}(a+ia\tan(c+dx))^{5/2}}$$
$$= \frac{\left(a^2\sec^5(c+dx)\right)\text{Subst}\left(\int (a-iax)^{3/2}(a+iax)^{\frac{3}{2}+n}\,dx, x, \tan(c+dx)\right)}{d(a-ia\tan(c+dx))^{5/2}(a+ia\tan(c+dx))^{5/2}}$$
$$= \frac{\left(2^{\frac{3}{2}+n}a^3\sec^5(c+dx)(a+ia\tan(c+dx))^{-2+n}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{-\frac{1}{2}-n}\right)\text{Su}}{d(a-ia\tan(c+dx))^{5}}$$
$$= \frac{i2^{\frac{5}{2}+n}a^2\,{}_2F_1\left(\frac{5}{2},-\frac{3}{2}-n;\frac{7}{2};\frac{1}{2}(1-i\tan(c+dx))\right)\sec^5(c+dx)(1+i\tan}{5d}$$

Mathematica [A] time = 14.01, size = 149, normalized size = 1.59

$$-\frac{i2^{n+5}e^{5i(c+dx)}\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^n {}_2F_1\left(-\frac{3}{2},1;n+\frac{7}{2};-e^{2i(c+dx)}\right)\sec^{-n}(c+dx)(\cos(dx)+i\sin(dx))^{-n}(a+ia\tan}{d(2n+5)\left(1+e^{2i(c+dx)}\right)^4}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sec[c + d*x]^5*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(5 + n)*E^((5*I)*(c + d*x))*(E^(I*d*x))^n*(E^(I*(c + d*x))/(1 + E^(
(2*I)*(c + d*x))))^n*Hypergeometric2F1[-3/2, 1, 7/2 + n, -E^((2*I)*(c + d*x
))]*(a + I*a*Tan[c + d*x])^n)/(d*(1 + E^((2*I)*(c + d*x)))^4*(5 + 2*n)*Sec[
c + d*x]^n*(Cos[d*x] + I*Sin[d*x])^n)
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{32\left(\frac{2\,ae^{(2i\,dx+2i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^n e^{(5i\,dx+5i\,c)}}{e^{(10i\,dx+10i\,c)}+5\,e^{(8i\,dx+8i\,c)}+10\,e^{(6i\,dx+6i\,c)}+10\,e^{(4i\,dx+4i\,c)}+5\,e^{(2i\,dx+2i\,c)}+1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral(32*(2*a*e^(2*I*d*x + 2*I*c)/(e^(2*I*d*x + 2*I*c) + 1))^n*e^(5*I*d*
x + 5*I*c)/(e^(10*I*d*x + 10*I*c) + 5*e^(8*I*d*x + 8*I*c) + 10*e^(6*I*d*x +
 6*I*c) + 10*e^(4*I*d*x + 4*I*c) + 5*e^(2*I*d*x + 2*I*c) + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^n\sec(dx+c)^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*sec(d*x + c)^5, x)
```

maple [F] time = 1.05, size = 0, normalized size = 0.00

$$\int \left(\sec^5(dx+c)\right)(a+ia\tan(dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^5*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int(sec(d*x+c)^5*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^n \sec(dx+c)^5 \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*sec(d*x + c)^5, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+a\tan(c+d\,x)\,1\mathrm{i})^n}{\cos(c+d\,x)^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^n/cos(c + d*x)^5,x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^n/cos(c + d*x)^5, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ia(\tan(c+dx)-i))^n \sec^5(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**5*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Integral((I*a*(tan(c + d*x) - I))**n*sec(c + d*x)**5, x)
```

3.472 $\int \sec^3(c+dx)(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=92

$$\frac{ia2^{n+\frac{3}{2}}\sec^3(c+dx)(1+i\tan(c+dx))^{-n-\frac{1}{2}}(a+ia\tan(c+dx))^{n-1}\,{}_2F_1\left(\frac{3}{2},-n-\frac{1}{2};\frac{5}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{3d}$$

```
[Out] 1/3*I*2^(3/2+n)*a*hypergeom([3/2, -1/2-n],[5/2],1/2-1/2*I*tan(d*x+c))*sec(d
*x+c)^3*(1+I*tan(d*x+c))^(-1/2-n)*(a+I*a*tan(d*x+c))^(-1+n)/d
```

Rubi [A] time = 0.18, antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {3505, 3523, 70, 69}

$$\frac{ia2^{n+\frac{3}{2}}\sec^3(c+dx)(1+i\tan(c+dx))^{-n-\frac{1}{2}}(a+ia\tan(c+dx))^{n-1}\text{Hypergeometric2F1}\left(\frac{3}{2},-n-\frac{1}{2},\frac{5}{2},\frac{1}{2}(1-i\,\text{ta}\right.}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((I/3)*2^(3/2 + n)*a*Hypergeometric2F1[3/2, -1/2 - n, 5/2, (1 - I*Tan[c + d
*x])/2]*Sec[c + d*x]^3*(1 + I*Tan[c + d*x])^(-1/2 - n)*(a + I*a*Tan[c + d*x
])^(-1 + n))/d
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \sec^3(c+dx)(a+ia\tan(c+dx))^n\,dx = \frac{\sec^3(c+dx)\int (a-ia\tan(c+dx))^{3/2}(a+ia\tan(c+dx))^{\frac{3}{2}+n}\,dx}{(a-ia\tan(c+dx))^{3/2}(a+ia\tan(c+dx))^{3/2}}$$
$$= \frac{\left(a^2\sec^3(c+dx)\right)\text{Subst}\left(\int \sqrt{a-iax}\,(a+iax)^{\frac{1}{2}+n}\,dx,x,\tan(c+dx)\right)}{d(a-ia\tan(c+dx))^{3/2}(a+ia\tan(c+dx))^{3/2}}$$
$$= \frac{\left(2^{\frac{1}{2}+n}a^2\sec^3(c+dx)(a+ia\tan(c+dx))^{-1+n}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{-\frac{1}{2}-n}\right)\text{Subst}}{d(a-ia\tan(c+dx))^{3/2}}$$
$$= \frac{i2^{\frac{3}{2}+n}a\,{}_2F_1\left(\frac{3}{2},-\frac{1}{2}-n;\frac{5}{2};\frac{1}{2}(1-i\tan(c+dx))\right)\sec^3(c+dx)(1+i\tan(c+}{3d}$$

Mathematica [A] time = 13.30, size = 149, normalized size = 1.62

$$-\frac{i2^{n+3}e^{3i(c+dx)}\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^n {}_2F_1\left(-\frac{1}{2},1;n+\frac{5}{2};-e^{2i(c+dx)}\right)\sec^{-n}(c+dx)(\cos(dx)+i\sin(dx))^{-n}(a+ia\tan(c+}{d(2n+3)\left(1+e^{2i(c+dx)}\right)^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sec[c + d*x]^3*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(3 + n)*E^((3*I)*(c + d*x))*(E^(I*d*x))^n*(E^(I*(c + d*x))/(1 + E^(
(2*I)*(c + d*x))))^n*Hypergeometric2F1[-1/2, 1, 5/2 + n, -E^((2*I)*(c + d*x
))]*(a + I*a*Tan[c + d*x])^n)/(d*(1 + E^((2*I)*(c + d*x)))^2*(3 + 2*n)*Sec[
c + d*x]^n*(Cos[d*x] + I*Sin[d*x])^n)
```

fricas [F] time = 0.92, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{8\left(\frac{2\,ae^{(2i\,dx+2i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^n e^{(3i\,dx+3i\,c)}}{e^{(6i\,dx+6i\,c)}+3\,e^{(4i\,dx+4i\,c)}+3\,e^{(2i\,dx+2i\,c)}+1},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral(8*(2*a*e^(2*I*d*x + 2*I*c)/(e^(2*I*d*x + 2*I*c) + 1))^n*e^(3*I*d*x
 + 3*I*c)/(e^(6*I*d*x + 6*I*c) + 3*e^(4*I*d*x + 4*I*c) + 3*e^(2*I*d*x + 2*I
*c) + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^n\sec(dx+c)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*sec(d*x + c)^3, x)
```

maple [F] time = 1.46, size = 0, normalized size = 0.00

$$\int \left(\sec^3(dx+c)\right)(a+ia\tan(dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^n \sec(dx+c)^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*sec(d*x + c)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+a\tan(c+d\,x)\,1\mathrm{i})^n}{\cos(c+d\,x)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^n/cos(c + d*x)^3,x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^n/cos(c + d*x)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ia(\tan(c+dx)-i))^n \sec^3(c+dx)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Integral((I*a*(tan(c + d*x) - I))**n*sec(c + d*x)**3, x)
```

3.473 $\int \sec(c+dx)(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=88

$$\frac{ia2^{n+\frac{1}{2}}\sec(c+dx)(1+i\tan(c+dx))^{\frac{1}{2}-n}(a+ia\tan(c+dx))^{n-1}\,{}_2F_1\left(\frac{1}{2},\frac{1}{2}-n;\frac{3}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{d}$$

```
[Out] I*2^(1/2+n)*a*hypergeom([1/2, 1/2-n],[3/2],1/2-1/2*I*tan(d*x+c))*sec(d*x+c)
*(1+I*tan(d*x+c))^(1/2-n)*(a+I*a*tan(d*x+c))^(-1+n)/d
```

Rubi [A] time = 0.15, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = $\{3505, 3523, 70, 69\}$

$$\frac{ia2^{n+\frac{1}{2}}\sec(c+dx)(1+i\tan(c+dx))^{\frac{1}{2}-n}(a+ia\tan(c+dx))^{n-1}\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}-n,\frac{3}{2},\frac{1}{2}(1-i\tan(c+\right.}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] (I*2^(1/2 + n)*a*Hypergeometric2F1[1/2, 1/2 - n, 3/2, (1 - I*Tan[c + d*x])/
2]*Sec[c + d*x]*(1 + I*Tan[c + d*x])^(1/2 - n)*(a + I*a*Tan[c + d*x])^(-1 +
 n))/d
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] && !IntegerQ[m] && !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] || !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !In
tegerQ[m] && !IntegerQ[n] && (RationalQ[m] || !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \sec(c+dx)(a+ia\tan(c+dx))^n\,dx = \frac{\sec(c+dx)\int \sqrt{a-ia\tan(c+dx)}\,(a+ia\tan(c+dx))^{\frac{1}{2}+n}\,dx}{\sqrt{a-ia\tan(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}$$

$$= \frac{\left(a^2\sec(c+dx)\right)\text{Subst}\left(\int \frac{(a+iax)^{-\frac{1}{2}+n}}{\sqrt{a-iax}}\,dx, x, \tan(c+dx)\right)}{d\sqrt{a-ia\tan(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}$$

$$= \frac{\left(2^{-\frac{1}{2}+n}a^2\sec(c+dx)(a+ia\tan(c+dx))^{-1+n}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{\frac{1}{2}-n}\right)\text{Subs}}{d\sqrt{a-ia\tan(c+dx)}}$$

$$= \frac{i2^{\frac{1}{2}+n}a\,{}_2F_1\left(\frac{1}{2},\frac{1}{2}-n;\frac{3}{2};\frac{1}{2}(1-i\tan(c+dx))\right)\sec(c+dx)(1+i\tan(c+}{d}$$

Mathematica [A] time = 8.35, size = 134, normalized size = 1.52

$$-\frac{i2^{n+1}e^{i(c+dx)}\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^n {}_2F_1\left(\frac{1}{2},1;n+\frac{3}{2};-e^{2i(c+dx)}\right)\sec^{-n}(c+dx)(\cos(dx)+i\sin(dx))^{-n}(a+ia\tan(c}{d(2n+1)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sec[c + d*x]*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(1 + n)*E^(I*(c + d*x))*(E^(I*d*x))^n*(E^(I*(c + d*x))/(1 + E^((2*I
)*(c + d*x))))^n*Hypergeometric2F1[1/2, 1, 3/2 + n, -E^((2*I)*(c + d*x))]*(
a + I*a*Tan[c + d*x])^n)/(d*(1 + 2*n)*Sec[c + d*x]^n*(Cos[d*x] + I*Sin[d*x]
)^n)
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{2\left(\frac{2\,ae^{(2i\,dx+2i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^n e^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral(2*(2*a*e^(2*I*d*x + 2*I*c)/(e^(2*I*d*x + 2*I*c) + 1))^n*e^(I*d*x +
 I*c)/(e^(2*I*d*x + 2*I*c) + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^n\sec(dx+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*sec(d*x + c), x)
```

maple [F] time = 1.23, size = 0, normalized size = 0.00

$$\int \sec(dx+c)\,(a+ia\tan(dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int(sec(d*x+c)*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^n\sec(dx+c)\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*sec(d*x + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+a\tan(c+d\,x)\;1\mathrm{i})^n}{\cos(c+d\,x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^n/cos(c + d*x),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^n/cos(c + d*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ia\,(\tan(c+dx)-i))^n\sec(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Integral((I*a*(tan(c + d*x) - I))**n*sec(c + d*x), x)
```

3.474 $\int \cos(c+dx)(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=85

$$-\frac{i2^{n-\frac{1}{2}}\cos(c+dx)(1+i\tan(c+dx))^{\frac{1}{2}-n}(a+ia\tan(c+dx))^n\,{}_2F_1\left(-\frac{1}{2},\frac{3}{2}-n;\frac{1}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{d}$$

```
[Out] -I*2^(-1/2+n)*cos(d*x+c)*hypergeom([-1/2, 3/2-n],[1/2],1/2-1/2*I*tan(d*x+c)
)*(1+I*tan(d*x+c))^(1/2-n)*(a+I*a*tan(d*x+c))^n/d
```

Rubi [A] time = 0.17, antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {3505, 3523, 70, 69}

$$-\frac{i2^{n-\frac{1}{2}}\cos(c+dx)(1+i\tan(c+dx))^{\frac{1}{2}-n}(a+ia\tan(c+dx))^n\text{Hypergeometric2F1}\left(-\frac{1}{2},\frac{3}{2}-n,\frac{1}{2},\frac{1}{2}(1-i\tan(c\right.}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(-1/2 + n)*Cos[c + d*x]*Hypergeometric2F1[-1/2, 3/2 - n, 1/2, (1 -
I*Tan[c + d*x])/2]*(1 + I*Tan[c + d*x])^(1/2 - n)*(a + I*a*Tan[c + d*x])^n)
/d
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \cos(c+dx)(a+ia\tan(c+dx))^n\,dx = \left(\cos(c+dx)\sqrt{a-ia\tan(c+dx)}\,\sqrt{a+ia\tan(c+dx)}\right)\int \frac{(a+ia\tan(c+}{\sqrt{a-ia\tan(}$$

$$= \frac{\left(a^2\cos(c+dx)\sqrt{a-ia\tan(c+dx)}\,\sqrt{a+ia\tan(c+dx)}\right)\text{Subst}\left(\int \frac{(a+iax)}{(a-ia}\right.}{d}$$

$$= \frac{\left(2^{-\frac{3}{2}+n}a\cos(c+dx)\sqrt{a-ia\tan(c+dx)}\,(a+ia\tan(c+dx))^n\left(\frac{a+ia\tan(c+}{a}\right.\right.}{d}$$

$$= -\frac{i2^{-\frac{1}{2}+n}\cos(c+dx)\,{}_2F_1\left(-\frac{1}{2},\frac{3}{2}-n;\frac{1}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(1+i\tan(c+}{d}$$

Mathematica [A] time = 12.90, size = 136, normalized size = 1.60

$$-\frac{i2^{n-1}e^{i(c+dx)}\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{n-2}\,{}_2F_1\left(1,\frac{3}{2};n+\frac{1}{2};-e^{2i(c+dx)}\right)\sec^{-n}(c+dx)(\cos(dx)+i\sin(dx))^{-n}(a+ia\tan(c+}{d(2n-1)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Cos[c + d*x]*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(-1 + n)*E^(I*(c + d*x))*(E^(I*d*x))^n*(E^(I*(c + d*x))/(1 + E^((2*
I)*(c + d*x))))^(-2 + n)*Hypergeometric2F1[1, 3/2, 1/2 + n, -E^((2*I)*(c +
d*x))]*(a + I*a*Tan[c + d*x])^n)/(d*(-1 + 2*n)*Sec[c + d*x]^n*(Cos[d*x] + I
*Sin[d*x])^n)
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{2}\left(\frac{2\,ae^{(2i\,dx+2i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^n\left(e^{(2i\,dx+2i\,c)}+1\right)e^{(-i\,dx-i\,c)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral(1/2*(2*a*e^(2*I*d*x + 2*I*c)/(e^(2*I*d*x + 2*I*c) + 1))^n*(e^(2*I*
d*x + 2*I*c) + 1)*e^(-I*d*x - I*c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^n\cos(dx+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*cos(d*x + c), x)
```

maple [F] time = 1.84, size = 0, normalized size = 0.00

$$\int \cos(dx+c)\,(a+ia\tan(dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)*(a+I*a*tan(d*x+c))^n,x)
[Out] int(cos(d*x+c)*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^n\cos(dx+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
[Out] integrate((I*a*tan(d*x + c) + a)^n*cos(d*x + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \cos(c+d\,x)\,\left(a+a\tan(c+d\,x)\,1\mathrm{i}\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^n,x)
[Out] int(cos(c + d*x)*(a + a*tan(c + d*x)*1i)^n, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (ia(\tan(c+dx)-i))^n\cos(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+I*a*tan(d*x+c))**n,x)
[Out] Integral((I*a*(tan(c + d*x) - I))**n*cos(c + d*x), x)
```

3.475 $\int \cos^3(c+dx)(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=94

$$-\frac{i2^{n-\frac{3}{2}}\cos^3(c+dx)(1+i\tan(c+dx))^{\frac{1}{2}-n}(a+ia\tan(c+dx))^{n+1}\,{}_2F_1\left(-\frac{3}{2},\frac{5}{2}-n;-\frac{1}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{3ad}$$

```
[Out] -1/3*I*2^(-3/2+n)*cos(d*x+c)^3*hypergeom([-3/2, 5/2-n],[-1/2],1/2-1/2*I*tan
(d*x+c))*(1+I*tan(d*x+c))^(1/2-n)*(a+I*a*tan(d*x+c))^(1+n)/a/d
```

Rubi [A] time = 0.19, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {3505, 3523, 70, 69}

$$-\frac{i2^{n-\frac{3}{2}}\cos^3(c+dx)(1+i\tan(c+dx))^{\frac{1}{2}-n}(a+ia\tan(c+dx))^{n+1}\text{Hypergeometric2F1}\left(-\frac{3}{2},\frac{5}{2}-n,-\frac{1}{2},\frac{1}{2}(1-i\tan\right.}{3ad}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I/3)*2^(-3/2 + n)*Cos[c + d*x]^3*Hypergeometric2F1[-3/2, 5/2 - n, -1/2,
(1 - I*Tan[c + d*x])/2]*(1 + I*Tan[c + d*x])^(1/2 - n)*(a + I*a*Tan[c + d*x
])^(1 + n))/(a*d)
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \cos^3(c+dx)(a+ia\tan(c+dx))^n\,dx = \left(\cos^3(c+dx)(a-ia\tan(c+dx))^{3/2}(a+ia\tan(c+dx))^{3/2}\right)\int \frac{(a+ia}{(a-i}$$

$$= \frac{\left(a^2\cos^3(c+dx)(a-ia\tan(c+dx))^{3/2}(a+ia\tan(c+dx))^{3/2}\right)\text{Subst}}{d}$$

$$= \frac{\left(2^{-\frac{5}{2}+n}\cos^3(c+dx)(a-ia\tan(c+dx))^{3/2}(a+ia\tan(c+dx))^{1+n}\left(\frac{a+}{}\right.\right.}{d}$$

$$= -\frac{i2^{-\frac{3}{2}+n}\cos^3(c+dx)\,{}_2F_1\left(-\frac{3}{2},\frac{5}{2}-n;-\frac{1}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(1+i}{3ad}$$

Mathematica [A] time = 13.57, size = 149, normalized size = 1.59

$$-\frac{i2^{n-3}e^{-3i(c+dx)}\left(1+e^{2i(c+dx)}\right)^4\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^n{}_2F_1\left(1,\frac{5}{2};n-\frac{1}{2};-e^{2i(c+dx)}\right)\sec^{-n}(c+dx)(\cos(dx)+i\sin(dx)}{d(2n-3)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Cos[c + d*x]^3*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(-3 + n)*(E^(I*d*x))^n*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x))))^
n*(1 + E^((2*I)*(c + d*x)))^4*Hypergeometric2F1[1, 5/2, -1/2 + n, -E^((2*I)
*(c + d*x))]*(a + I*a*Tan[c + d*x])^n)/(d*E^((3*I)*(c + d*x))*(-3 + 2*n)*Se
c[c + d*x]^n*(Cos[d*x] + I*Sin[d*x])^n)
```

fricas [F] time = 0.65, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{8}\left(\frac{2\,ae^{(2i\,dx+2i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^n\left(e^{(6i\,dx+6i\,c)}+3\,e^{(4i\,dx+4i\,c)}+3\,e^{(2i\,dx+2i\,c)}+1\right)e^{(-3i\,dx-3i\,c)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral(1/8*(2*a*e^(2*I*d*x + 2*I*c)/(e^(2*I*d*x + 2*I*c) + 1))^n*(e^(6*I*
d*x + 6*I*c) + 3*e^(4*I*d*x + 4*I*c) + 3*e^(2*I*d*x + 2*I*c) + 1)*e^(-3*I*d
*x - 3*I*c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^n\cos(dx+c)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*cos(d*x + c)^3, x)
```

maple [F] time = 7.96, size = 0, normalized size = 0.00

$$\int \left(\cos^3(dx+c)\right)(a+ia\tan(dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i a \tan (dx + c) + a)^n \cos (dx + c)^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*cos(d*x + c)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \cos (c + d\,x)^3 \, (a + a \tan (c + d\,x)\, 1i)^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^n,x)
```

```
[Out] int(cos(c + d*x)^3*(a + a*tan(c + d*x)*1i)^n, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Timed out
```

3.476 $\int \cos^5(c+dx)(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=94

$$-\frac{i2^{n-\frac{5}{2}}\cos^5(c+dx)(1+i\tan(c+dx))^{\frac{1}{2}-n}(a+ia\tan(c+dx))^{n+2}\,{}_2F_1\left(-\frac{5}{2},\frac{7}{2}-n;-\frac{3}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{5a^2d}$$

```
[Out] -1/5*I*2^(-5/2+n)*cos(d*x+c)^5*hypergeom([-5/2, 7/2-n],[-3/2],1/2-1/2*I*tan
(d*x+c))*(1+I*tan(d*x+c))^(1/2-n)*(a+I*a*tan(d*x+c))^(2+n)/a^2/d
```

Rubi [A] time = 0.19, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {3505, 3523, 70, 69}

$$-\frac{i2^{n-\frac{5}{2}}\cos^5(c+dx)(1+i\tan(c+dx))^{\frac{1}{2}-n}(a+ia\tan(c+dx))^{n+2}\text{Hypergeometric2F1}\left(-\frac{5}{2},\frac{7}{2}-n,-\frac{3}{2},\frac{1}{2}(1-i\tan(c+dx))\right)}{5a^2d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I/5)*2^(-5/2 + n)*Cos[c + d*x]^5*Hypergeometric2F1[-5/2, 7/2 - n, -3/2,
(1 - I*Tan[c + d*x])/2]*(1 + I*Tan[c + d*x])^(1/2 - n)*(a + I*a*Tan[c + d*x
])^(2 + n))/(a^2*d)
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \cos^5(c+dx)(a+ia\tan(c+dx))^n\,dx = \left(\cos^5(c+dx)(a-ia\tan(c+dx))^{5/2}(a+ia\tan(c+dx))^{5/2}\right)\int \frac{(a+ia\tan}{(a-ia\tan}$$

$$= \frac{\left(a^2\cos^5(c+dx)(a-ia\tan(c+dx))^{5/2}(a+ia\tan(c+dx))^{5/2}\right)\text{Subst}\left(\int\right.}{d}$$

$$= \frac{\left(2^{-\frac{7}{2}+n}\cos^5(c+dx)(a-ia\tan(c+dx))^{5/2}(a+ia\tan(c+dx))^{2+n}\left(\frac{a+ia\tan}{}\right.\right.}{ad}$$

$$= -\frac{i2^{-\frac{5}{2}+n}\cos^5(c+dx)\,{}_2F_1\left(-\frac{5}{2},\frac{7}{2}-n;-\frac{3}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(1+i\tan}{5a^2d}$$

Mathematica [A] time = 6.33, size = 149, normalized size = 1.59

$$-\frac{i2^{n-5}e^{-5i(c+dx)}\left(1+e^{2i(c+dx)}\right)^6\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^n{}_2F_1\left(1,\frac{7}{2};n-\frac{3}{2};-e^{2i(c+dx)}\right)\sec^{-n}(c+dx)(\cos(dx)+i\sin(dx))^{-n}}{d(2n-5)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Cos[c + d*x]^5*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(-5 + n)*(E^(I*d*x))^n*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x))))^
n*(1 + E^((2*I)*(c + d*x)))^6*Hypergeometric2F1[1, 7/2, -3/2 + n, -E^((2*I)
*(c + d*x))]*(a + I*a*Tan[c + d*x])^n)/(d*E^((5*I)*(c + d*x))*(-5 + 2*n)*Se
c[c + d*x]^n*(Cos[d*x] + I*Sin[d*x])^n)
```

fricas [F] time = 0.77, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{32}\left(\frac{2\,ae^{(2i\,dx+2i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^n\left(e^{(10i\,dx+10i\,c)}+5\,e^{(8i\,dx+8i\,c)}+10\,e^{(6i\,dx+6i\,c)}+10\,e^{(4i\,dx+4i\,c)}+5\,e^{(2i\,dx+2i\,c)}+1\right)e^{(-5i\,dx}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral(1/32*(2*a*e^(2*I*d*x + 2*I*c)/(e^(2*I*d*x + 2*I*c) + 1))^n*(e^(10*
I*d*x + 10*I*c) + 5*e^(8*I*d*x + 8*I*c) + 10*e^(6*I*d*x + 6*I*c) + 10*e^(4*
I*d*x + 4*I*c) + 5*e^(2*I*d*x + 2*I*c) + 1)*e^(-5*I*d*x - 5*I*c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^n\cos(dx+c)^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*cos(d*x + c)^5, x)
```

maple [F] time = 6.78, size = 0, normalized size = 0.00

$$\int \left(\cos^5(dx+c)\right)(a+ia\tan(dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^n\cos(dx+c)^5\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n*cos(d*x + c)^5, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \cos(c+d\,x)^5\,(a+a\tan(c+d\,x)\,1\mathrm{i})^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^n,x)
```

```
[Out] int(cos(c + d*x)^5*(a + a*tan(c + d*x)*1i)^n, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**5*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Timed out
```

3.477 $\int (e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=96

$$\frac{ia2^{n+\frac{9}{4}}(e\sec(c+dx))^{5/2}(1+i\tan(c+dx))^{-n-\frac{1}{4}}(a+ia\tan(c+dx))^{n-1}\,{}_2F_1\left(\frac{5}{4},-n-\frac{1}{4};\frac{9}{4};\frac{1}{2}(1-i\tan(c+dx))\right)}{5d}$$

[Out] 1/5*I*2^(9/4+n)*a*hypergeom([5/4, -1/4-n],[9/4],1/2-1/2*I*tan(d*x+c))*(e*sec(d*x+c))^(5/2)*(1+I*tan(d*x+c))^(-1/4-n)*(a+I*a*tan(d*x+c))^(-1+n)/d

Rubi [A] time = 0.20, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3505, 3523, 70, 69}

$$\frac{ia2^{n+\frac{9}{4}}(e\sec(c+dx))^{5/2}(1+i\tan(c+dx))^{-n-\frac{1}{4}}(a+ia\tan(c+dx))^{n-1}\text{Hypergeometric2F1}\left(\frac{5}{4},-n-\frac{1}{4},\frac{9}{4},\frac{1}{2}(1-i\tan(c+dx))\right)}{5d}$$

Antiderivative was successfully verified.

[In] Int[(e*Sec[c + d*x])^(5/2)*(a + I*a*Tan[c + d*x])^n,x]

[Out] ((I/5)*2^(9/4 + n)*a*Hypergeometric2F1[5/4, -1/4 - n, 9/4, (1 - I*Tan[c + d*x])/2]*(e*Sec[c + d*x])^(5/2)*(1 + I*Tan[c + d*x])^(-1/4 - n)*(a + I*a*Tan[c + d*x])^(-1 + n))/d

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c - a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !IntegerQ[m] && !IntegerQ[n] && GtQ[b/(b*c - a*d), 0] && (RationalQ[m] || !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d), x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !IntegerQ[m] && !IntegerQ[n] && (RationalQ[m] || !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*Tan[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))^n\,dx = \frac{(e\sec(c+dx))^{5/2}\int (a-ia\tan(c+dx))^{5/4}(a+ia\tan(c+dx))^{\frac{5}{4}+n}}{(a-ia\tan(c+dx))^{5/4}(a+ia\tan(c+dx))^{5/4}}$$

$$= \frac{\left(a^2(e\sec(c+dx))^{5/2}\right)\text{Subst}\left(\int \sqrt[4]{a-iax}\,(a+iax)^{\frac{1}{4}+n}\,dx, x, \tan(\right.}{d(a-ia\tan(c+dx))^{5/4}(a+ia\tan(c+dx))^{5/4}}$$

$$= \frac{\left(2^{\frac{1}{4}+n}a^2(e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))^{-1+n}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{-}\right.}{d(a-ia\tan(c+}$$

$$= \frac{i2^{\frac{9}{4}+n}a\,{}_2F_1\left(\frac{5}{4},-\frac{1}{4}-n;\frac{9}{4};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx))^{5/2}(1}{5d}$$

Mathematica [A] time = 9.06, size = 156, normalized size = 1.62

$$-\frac{i2^{n+\frac{7}{2}}e^{i(c+dx)}\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{n+\frac{3}{2}}(e\sec(c+dx))^{5/2}\,{}_2F_1\left(-\frac{1}{4},1;n+\frac{9}{4};-e^{2i(c+dx)}\right)\sec^{-n-\frac{5}{2}}(c+dx)(\cos(dx)+i}{d(4n+5)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Sec[c + d*x])^(5/2)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(7/2 + n)*E^(I*(c + d*x))*(E^(I*d*x))^n*(E^(I*(c + d*x))/(1 + E^((2
*I)*(c + d*x))))^(3/2 + n)*Hypergeometric2F1[-1/4, 1, 9/4 + n, -E^((2*I)*(c
 + d*x))]*Sec[c + d*x]^(-5/2 - n)*(e*Sec[c + d*x])^(5/2)*(a + I*a*Tan[c + d
*x])^n)/(d*(5 + 4*n)*(Cos[d*x] + I*Sin[d*x])^n)
```

fricas [F] time = 0.65, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{4\sqrt{2}e^2\left(\frac{2ae^{(2idx+2ic)}}{e^{(2idx+2ic)}+1}\right)^n\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}\,e^{\left(\frac{5}{2}idx+\frac{5}{2}ic\right)}}{e^{(4idx+4ic)}+2e^{(2idx+2ic)}+1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral(4*sqrt(2)*e^2*(2*a*e^(2*I*d*x + 2*I*c)/(e^(2*I*d*x + 2*I*c) + 1))^
n*sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(5/2*I*d*x + 5/2*I*c)/(e^(4*I*d*x + 4
*I*c) + 2*e^(2*I*d*x + 2*I*c) + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{\frac{5}{2}}(ia\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(5/2)*(I*a*tan(d*x + c) + a)^n, x)
```

maple [F] time = 0.85, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{\frac{5}{2}}(a+ia\tan(dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(5/2)*(a+I*a*tan(d*x+c))^n,x)
[Out] int((e*sec(d*x+c))^(5/2)*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{\frac{5}{2}} (ia\tan(dx+c)+a)^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5/2)*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
[Out] integrate((e*sec(d*x + c))^(5/2)*(I*a*tan(d*x + c) + a)^n, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(\frac{e}{\cos(c+d\,x)}\right)^{5/2} (a+a\tan(c+d\,x)\,1\mathrm{i})^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(5/2)*(a + a*tan(c + d*x)*1i)^n,x)
[Out] int((e/cos(c + d*x))^(5/2)*(a + a*tan(c + d*x)*1i)^n, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(5/2)*(a+I*a*tan(d*x+c))**n,x)
[Out] Timed out
```

3.478 $\int (e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=96

$$\frac{ia2^{n+\frac{7}{4}}(e\sec(c+dx))^{3/2}(1+i\tan(c+dx))^{\frac{1}{4}-n}(a+ia\tan(c+dx))^{n-1}\,{}_2F_1\left(\frac{3}{4},\frac{1}{4}-n;\frac{7}{4};\frac{1}{2}(1-i\tan(c+dx))\right)}{3d}$$

```
[Out] 1/3*I*2^(7/4+n)*a*hypergeom([3/4, 1/4-n],[7/4],1/2-1/2*I*tan(d*x+c))*(e*sec
(d*x+c))^(3/2)*(1+I*tan(d*x+c))^(1/4-n)*(a+I*a*tan(d*x+c))^(-1+n)/d
```

Rubi [A] time = 0.20, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3505, 3523, 70, 69}

$$\frac{ia2^{n+\frac{7}{4}}(e\sec(c+dx))^{3/2}(1+i\tan(c+dx))^{\frac{1}{4}-n}(a+ia\tan(c+dx))^{n-1}\text{Hypergeometric2F1}\left(\frac{3}{4},\frac{1}{4}-n,\frac{7}{4},\frac{1}{2}(1-i\right.}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((I/3)*2^(7/4 + n)*a*Hypergeometric2F1[3/4, 1/4 - n, 7/4, (1 - I*Tan[c + d*
x])/2]*(e*Sec[c + d*x])^(3/2)*(1 + I*Tan[c + d*x])^(1/4 - n)*(a + I*a*Tan[c
 + d*x])^(-1 + n))/d
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] && !IntegerQ[m] && !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] || !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !In
tegerQ[m] && !IntegerQ[n] && (RationalQ[m] || !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^n\,dx = \frac{(e\sec(c+dx))^{3/2}\int (a-ia\tan(c+dx))^{3/4}(a+ia\tan(c+dx))^{\frac{3}{4}+n}\,dx}{(a-ia\tan(c+dx))^{3/4}(a+ia\tan(c+dx))^{3/4}}$$

$$= \frac{\left(a^2(e\sec(c+dx))^{3/2}\right)\text{Subst}\left(\int \frac{(a+iax)^{-\frac{1}{4}+n}}{\sqrt[4]{a-iax}}\,dx, x, \tan(c+dx)\right)}{d(a-ia\tan(c+dx))^{3/4}(a+ia\tan(c+dx))^{3/4}}$$

$$= \frac{\left(2^{-\frac{1}{4}+n}a^2(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^{-1+n}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{\frac{1}{4}-n}\right.}{d(a-ia\tan(c+dx))^{3/4}}$$

$$= \frac{i2^{\frac{7}{4}+n}a\,{}_2F_1\left(\frac{3}{4},\frac{1}{4}-n;\frac{7}{4};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx))^{3/2}(1+i}{3d}$$

Mathematica [A] time = 8.93, size = 156, normalized size = 1.62

$$-\frac{i2^{n+\frac{5}{2}}e^{i(c+dx)}\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{n+\frac{1}{2}}(e\sec(c+dx))^{3/2}\,{}_2F_1\left(\frac{1}{4},1;n+\frac{7}{4};-e^{2i(c+dx)}\right)\sec^{-n-\frac{3}{2}}(c+dx)(\cos(dx)+i\sin(}{d(4n+3)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(5/2 + n)*E^(I*(c + d*x))*(E^(I*d*x))^n*(E^(I*(c + d*x))/(1 + E^((2
*I)*(c + d*x))))^(1/2 + n)*Hypergeometric2F1[1/4, 1, 7/4 + n, -E^((2*I)*(c
+ d*x))]*Sec[c + d*x]^(-3/2 - n)*(e*Sec[c + d*x])^(3/2)*(a + I*a*Tan[c + d*
x])^n)/(d*(3 + 4*n)*(Cos[d*x] + I*Sin[d*x])^n)
```

fricas [F] time = 0.60, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{2\sqrt{2}e\left(\frac{2ae^{(2idx+2ic)}}{e^{(2idx+2ic)}+1}\right)^n\sqrt{\frac{e}{e^{(2idx+2ic)}+1}}e^{\left(\frac{3}{2}idx+\frac{3}{2}ic\right)}}{e^{(2idx+2ic)}+1}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral(2*sqrt(2)*e*(2*a*e^(2*I*d*x + 2*I*c)/(e^(2*I*d*x + 2*I*c) + 1))^n*
sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(3/2*I*d*x + 3/2*I*c)/(e^(2*I*d*x + 2*I
*c) + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{\frac{3}{2}}(ia\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(3/2)*(I*a*tan(d*x + c) + a)^n, x)
```

maple [F] time = 0.83, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{\frac{3}{2}}(a+ia\tan(dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int((e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{\frac{3}{2}} (i\,a\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] integrate((e*sec(d*x + c))^(3/2)*(I*a*tan(d*x + c) + a)^n, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(\frac{e}{\cos(c+d\,x)}\right)^{3/2} (a+a\tan(c+d\,x)\,1\mathrm{i})^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^n,x)
```

```
[Out] int((e/cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^n, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(c+dx))^{\frac{3}{2}} (ia(\tan(c+dx)-i))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(3/2)*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Integral((e*sec(c + d*x))**(3/2)*(I*a*(tan(c + d*x) - I))**n, x)
```

3.479 $\int \sqrt{e \sec(c+dx)}\,(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=94

$$\frac{ia2^{n+\frac{5}{4}}\sqrt{e\sec(c+dx)}\,(1+i\tan(c+dx))^{\frac{3}{4}-n}(a+ia\tan(c+dx))^{n-1}\,{}_2F_1\left(\frac{1}{4},\frac{3}{4}-n;\frac{5}{4};\frac{1}{2}(1-i\tan(c+dx))\right)}{d}$$

```
[Out] I*2^(5/4+n)*a*hypergeom([1/4, 3/4-n],[5/4],1/2-1/2*I*tan(d*x+c))*(e*sec(d*x
+c))^(1/2)*(1+I*tan(d*x+c))^(3/4-n)*(a+I*a*tan(d*x+c))^(-1+n)/d
```

Rubi [A] time = 0.17, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3505, 3523, 70, 69}

$$\frac{ia2^{n+\frac{5}{4}}\sqrt{e\sec(c+dx)}\,(1+i\tan(c+dx))^{\frac{3}{4}-n}(a+ia\tan(c+dx))^{n-1}\text{Hypergeometric2F1}\left(\frac{1}{4},\frac{3}{4}-n,\frac{5}{4},\frac{1}{2}(1-i\tan(c+dx))\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] (I*2^(5/4 + n)*a*Hypergeometric2F1[1/4, 3/4 - n, 5/4, (1 - I*Tan[c + d*x])/
2]*Sqrt[e*Sec[c + d*x]]*(1 + I*Tan[c + d*x])^(3/4 - n)*(a + I*a*Tan[c + d*x
])^(-1 + n))/d
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^n\,dx = \frac{\sqrt{e\sec(c+dx)}\int \sqrt[4]{a-ia\tan(c+dx)}\,(a+ia\tan(c+dx))^{\frac{1}{4}+n}\,dx}{\sqrt[4]{a-ia\tan(c+dx)}\,\sqrt[4]{a+ia\tan(c+dx)}}$$

$$= \frac{\left(a^2\sqrt{e\sec(c+dx)}\right)\text{Subst}\left(\int \frac{(a+iax)^{-\frac{3}{4}+n}}{(a-iax)^{3/4}}\,dx,x,\tan(c+dx)\right)}{d\sqrt[4]{a-ia\tan(c+dx)}\,\sqrt[4]{a+ia\tan(c+dx)}}$$

$$= \frac{\left(2^{-\frac{3}{4}+n}a^2\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^{-1+n}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{\frac{3}{4}-n}\right.}{d\sqrt[4]{a-ia\tan(c+dx)}}$$

$$= \frac{i2^{\frac{5}{4}+n}a\,{}_2F_1\left(\frac{1}{4},\frac{3}{4}-n;\frac{5}{4};\frac{1}{2}(1-i\tan(c+dx))\right)\sqrt{e\sec(c+dx)}\,(1+i}{d}$$

Mathematica [A] time = 8.54, size = 156, normalized size = 1.66

$$-\frac{i2^{n+\frac{3}{2}}e^{i(c+dx)}\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{n-\frac{1}{2}}\sqrt{e\sec(c+dx)}\,{}_2F_1\left(\frac{3}{4},1;n+\frac{5}{4};-e^{2i(c+dx)}\right)\sec^{-n-\frac{1}{2}}(c+dx)(\cos(dx)+i\sin(}{d(4n+1)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(3/2 + n)*E^(I*(c + d*x))*(E^(I*d*x))^n*(E^(I*(c + d*x))/(1 + E^((2
*I)*(c + d*x))))^(-1/2 + n)*Hypergeometric2F1[3/4, 1, 5/4 + n, -E^((2*I)*(c
 + d*x))]*Sec[c + d*x]^(-1/2 - n)*Sqrt[e*Sec[c + d*x]]*(a + I*a*Tan[c + d*x
])^n)/(d*(1 + 4*n)*(Cos[d*x] + I*Sin[d*x])^n)
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{2}\left(\frac{2\,ae^{(2i\,dx+2i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^n\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral(sqrt(2)*(2*a*e^(2*I*d*x + 2*I*c)/(e^(2*I*d*x + 2*I*c) + 1))^n*sqrt
(e/(e^(2*I*d*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{e\sec(dx+c)}\,(i\,a\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*sec(d*x + c))*(I*a*tan(d*x + c) + a)^n, x)
```

maple [F] time = 0.87, size = 0, normalized size = 0.00

$$\int \sqrt{e\sec(dx+c)}\,\,(a+ia\tan(dx+c))^n\,\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{e \sec(dx+c)}\,(i\,a\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(e*sec(d*x + c))*(I*a*tan(d*x + c) + a)^n, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \sqrt{\frac{e}{\cos(c+d\,x)}}\,(a+a\tan(c+d\,x)\,1\mathrm{i})^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^n,x)
```

```
[Out] int((e/cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^n, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{e\sec(c+dx)}\,\left(ia\left(\tan(c+dx)-i\right)\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(1/2)*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Integral(sqrt(e*sec(c + d*x))*(I*a*(tan(c + d*x) - I))**n, x)
```

3.480 $\int \frac{(a+ia\tan(c+dx))^n}{\sqrt{e\sec(c+dx)}}\,dx$

Optimal. Leaf size=91

$$-\frac{i2^{n+\frac{3}{4}}(1+i\tan(c+dx))^{\frac{1}{4}-n}(a+ia\tan(c+dx))^n\,{}_2F_1\left(-\frac{1}{4},\frac{5}{4}-n;\frac{3}{4};\frac{1}{2}(1-i\tan(c+dx))\right)}{d\sqrt{e\sec(c+dx)}}$$

```
[Out] -I*2^(3/4+n)*hypergeom([-1/4, 5/4-n],[3/4],1/2-1/2*I*tan(d*x+c))*(1+I*tan(d
*x+c))^(1/4-n)*(a+I*a*tan(d*x+c))^n/d/(e*sec(d*x+c))^(1/2)
```

Rubi [A] time = 0.18, antiderivative size = 91, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3505, 3523, 70, 69}

$$-\frac{i2^{n+\frac{3}{4}}(1+i\tan(c+dx))^{\frac{1}{4}-n}(a+ia\tan(c+dx))^n\text{Hypergeometric2F1}\left(-\frac{1}{4},\frac{5}{4}-n,\frac{3}{4},\frac{1}{2}(1-i\tan(c+dx))\right)}{d\sqrt{e\sec(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^n/Sqrt[e*Sec[c + d*x]],x]
```

```
[Out] ((-I)*2^(3/4 + n)*Hypergeometric2F1[-1/4, 5/4 - n, 3/4, (1 - I*Tan[c + d*x]
)/2]*(1 + I*Tan[c + d*x])^(1/4 - n)*(a + I*a*Tan[c + d*x])^n)/(d*Sqrt[e*Sec
[c + d*x]])
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^n}{\sqrt{e\sec(c+dx)}}\,dx = \frac{\left(\sqrt[4]{a-ia\tan(c+dx)}\sqrt[4]{a+ia\tan(c+dx)}\right)\int \frac{(a+ia\tan(c+dx))^{-\frac{1}{4}+n}}{\sqrt[4]{a-ia\tan(c+dx)}}\,dx}{\sqrt{e\sec(c+dx)}}$$

$$= \frac{\left(a^2\sqrt[4]{a-ia\tan(c+dx)}\sqrt[4]{a+ia\tan(c+dx)}\right)\mathrm{Subst}\left(\int \frac{(a+iax)^{-\frac{5}{4}+n}}{(a-iax)^{5/4}}\,dx, x, \tan(c+dx)\right)}{d\sqrt{e\sec(c+dx)}}$$

$$= \frac{\left(2^{-\frac{5}{4}+n}a\sqrt[4]{a-ia\tan(c+dx)}(a+ia\tan(c+dx))^n\left(\frac{a+ia\tan(c+dx)}{a}\right)^{\frac{1}{4}-n}\right)\mathrm{Subst}\left(\int \frac{\left(\frac{1}{2}+\frac{ix}{2}\right.}{(a-ia}\right.}{d\sqrt{e\sec(c+dx)}}$$

$$= -\frac{i2^{\frac{3}{4}+n}\,{}_2F_1\left(-\frac{1}{4},\frac{5}{4}-n;\frac{3}{4};\frac{1}{2}(1-i\tan(c+dx))\right)(1+i\tan(c+dx))^{\frac{1}{4}-n}(a+ia\tan(c+}{d\sqrt{e\sec(c+dx)}}$$

Mathematica [A] time = 9.75, size = 129, normalized size = 1.42

$$-\frac{i2^{n+\frac{1}{2}}e^{i(c+dx)}\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{n-\frac{3}{2}}\,{}_2F_1\left(1,\frac{5}{4};n+\frac{3}{4};-e^{2i(c+dx)}\right)\sec^{\frac{1}{2}-n}(c+dx)(a+ia\tan(c+dx))^n}{d(4n-1)\sqrt{e\sec(c+dx)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^n/Sqrt[e*Sec[c + d*x]],x]
```

```
[Out] ((-I)*2^(1/2 + n)*E^(I*(c + d*x))*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x))
))^(-3/2 + n)*Hypergeometric2F1[1, 5/4, 3/4 + n, -E^((2*I)*(c + d*x))]*Sec[
c + d*x]^(1/2 - n)*(a + I*a*Tan[c + d*x])^n)/(d*(-1 + 4*n)*Sqrt[e*Sec[c + d
*x]])
```

fricas [F] time = 0.66, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{2}\left(\frac{2\,ae^{(2i\,dx+2i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^n\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(e^{(2i\,dx+2i\,c)}+1\right)e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{2\,e}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^n/(e*sec(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] integral(1/2*sqrt(2)*(2*a*e^(2*I*d*x + 2*I*c)/(e^(2*I*d*x + 2*I*c) + 1))^n*
sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(e^(2*I*d*x + 2*I*c) + 1)*e^(-1/2*I*d*x -
 1/2*I*c)/e, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(i\,a\tan(dx+c)+a)^n}{\sqrt{e\sec(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^n/(e*sec(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n/sqrt(e*sec(d*x + c)), x)
```

maple [F] time = 0.88, size = 0, normalized size = 0.00

$$\int \frac{(a + ia\tan(dx+c))^n}{\sqrt{e\sec(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^n/(e*sec(d*x+c))^(1/2),x)
```

```
[Out] int((a+I*a*tan(d*x+c))^n/(e*sec(d*x+c))^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(i\,a\tan(dx+c) + a)^n}{\sqrt{e\sec(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^n/(e*sec(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n/sqrt(e*sec(d*x + c)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a + a\tan(c + d\,x)\,1\mathrm{i})^n}{\sqrt{\frac{e}{\cos(c+d\,x)}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^n/(e/cos(c + d*x))^(1/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^n/(e/cos(c + d*x))^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ia(\tan(c+dx) - i))^n}{\sqrt{e\sec(c+dx)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**n/(e*sec(d*x+c))**(1/2),x)
```

```
[Out] Integral((I*a*(tan(c + d*x) - I))**n/sqrt(e*sec(c + d*x)), x)
```

3.481 $\int \frac{(a+ia\tan(c+dx))^n}{(e\sec(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=93

$$-\frac{i2^{n+\frac{1}{4}}(1+i\tan(c+dx))^{\frac{3}{4}-n}(a+ia\tan(c+dx))^n\,{}_2F_1\left(-\frac{3}{4},\frac{7}{4}-n;\frac{1}{4};\frac{1}{2}(1-i\tan(c+dx))\right)}{3d(e\sec(c+dx))^{3/2}}$$

```
[Out] -1/3*I*2^(1/4+n)*hypergeom([-3/4, 7/4-n],[1/4],1/2-1/2*I*tan(d*x+c))*(1+I*t
an(d*x+c))^(3/4-n)*(a+I*a*tan(d*x+c))^n/d/(e*sec(d*x+c))^(3/2)
```

Rubi [A] time = 0.21, antiderivative size = 93, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3505, 3523, 70, 69}

$$-\frac{i2^{n+\frac{1}{4}}(1+i\tan(c+dx))^{\frac{3}{4}-n}(a+ia\tan(c+dx))^n\text{Hypergeometric2F1}\left(-\frac{3}{4},\frac{7}{4}-n,\frac{1}{4},\frac{1}{2}(1-i\tan(c+dx))\right)}{3d(e\sec(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^n/(e*Sec[c + d*x])^(3/2),x]
```

```
[Out] ((-I/3)*2^(1/4 + n)*Hypergeometric2F1[-3/4, 7/4 - n, 1/4, (1 - I*Tan[c + d*
x])/2]*(1 + I*Tan[c + d*x])^(3/4 - n)*(a + I*a*Tan[c + d*x])^n)/(d*(e*Sec[c
 + d*x])^(3/2))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^n}{(e\sec(c+dx))^{3/2}}\,dx = \frac{\left((a-ia\tan(c+dx))^{3/4}(a+ia\tan(c+dx))^{3/4}\right)\int \frac{(a+ia\tan(c+dx))^{-\frac{3}{4}+n}}{(a-ia\tan(c+dx))^{3/4}}\,dx}{(e\sec(c+dx))^{3/2}}$$

$$= \frac{\left(a^2(a-ia\tan(c+dx))^{3/4}(a+ia\tan(c+dx))^{3/4}\right)\text{Subst}\left(\int \frac{(a+iax)^{-\frac{7}{4}+n}}{(a-iax)^{7/4}}\,dx, x, \tan(c\right.}{d(e\sec(c+dx))^{3/2}}$$

$$= \frac{\left(2^{-\frac{7}{4}+n}a(a-ia\tan(c+dx))^{3/4}(a+ia\tan(c+dx))^n\left(\frac{a+ia\tan(c+dx)}{a}\right)^{\frac{3}{4}-n}\right)\text{Subst}\left(\int\right.}{d(e\sec(c+dx))^{3/2}}$$

$$= -\frac{i2^{\frac{1}{4}+n}\,{}_2F_1\left(-\frac{3}{4},\frac{7}{4}-n;\frac{1}{4};\frac{1}{2}(1-i\tan(c+dx))\right)(1+i\tan(c+dx))^{\frac{3}{4}-n}(a+ia\tan(c}{3d(e\sec(c+dx))^{3/2}}$$

Mathematica [A] time = 10.34, size = 129, normalized size = 1.39

$$-\frac{i2^{n-\frac{1}{2}}e^{i(c+dx)}\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{n-\frac{5}{2}}{}_2F_1\left(1,\frac{7}{4};n+\frac{1}{4};-e^{2i(c+dx)}\right)\sec^{\frac{3}{2}-n}(c+dx)(a+ia\tan(c+dx))^n}{d(4n-3)(e\sec(c+dx))^{3/2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^n/(e*Sec[c + d*x])^(3/2),x]
```

```
[Out] ((-I)*2^(-1/2 + n)*E^(I*(c + d*x))*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x)
)))^(-5/2 + n)*Hypergeometric2F1[1, 7/4, 1/4 + n, -E^((2*I)*(c + d*x))]*Sec
[c + d*x]^(3/2 - n)*(a + I*a*Tan[c + d*x])^n)/(d*(-3 + 4*n)*(e*Sec[c + d*x]
)^(3/2))
```

fricas [F] time = 0.77, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{2}\left(\frac{2\,ae^{(2i\,dx+2i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^n\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(e^{(4i\,dx+4i\,c)}+2\,e^{(2i\,dx+2i\,c)}+1\right)e^{\left(-\frac{3}{2}i\,dx-\frac{3}{2}i\,c\right)}}{4\,e^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^n/(e*sec(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] integral(1/4*sqrt(2)*(2*a*e^(2*I*d*x + 2*I*c)/(e^(2*I*d*x + 2*I*c) + 1))^n*
sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(e^(4*I*d*x + 4*I*c) + 2*e^(2*I*d*x + 2*I
*c) + 1)*e^(-3/2*I*d*x - 3/2*I*c)/e^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(i\,a\tan(dx+c)+a)^n}{(e\sec(dx+c))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^n/(e*sec(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n/(e*sec(d*x + c))^(3/2), x)
```

maple [F] time = 0.87, size = 0, normalized size = 0.00

$$\int \frac{(a + ia\tan(dx + c))^n}{(e\sec(dx + c))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^n/(e*sec(d*x+c))^(3/2),x)
[Out] int((a+I*a*tan(d*x+c))^n/(e*sec(d*x+c))^(3/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(i\,a\tan(dx + c) + a)^n}{(e\sec(dx + c))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^n/(e*sec(d*x+c))^(3/2),x, algorithm="maxima")
[Out] integrate((I*a*tan(d*x + c) + a)^n/(e*sec(d*x + c))^(3/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a + a\tan(c + d\,x)\ 1\mathrm{i})^n}{\left(\frac{e}{\cos(c+d\,x)}\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^n/(e/cos(c + d*x))^(3/2),x)
[Out] int((a + a*tan(c + d*x)*1i)^n/(e/cos(c + d*x))^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ia(\tan(c + dx) - i))^n}{(e\sec(c + dx))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**n/(e*sec(d*x+c))**(3/2),x)
[Out] Integral((I*a*(tan(c + d*x) - I))**n/(e*sec(c + d*x))**(3/2), x)
```

3.482 $\int \frac{(a+ia\tan(c+dx))^n}{(e\sec(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=98

$$-\frac{i2^{n-\frac{1}{4}}(1+i\tan(c+dx))^{\frac{1}{4}-n}(a+ia\tan(c+dx))^{n+1}\,{}_2F_1\left(-\frac{5}{4},\frac{9}{4}-n;-\frac{1}{4};\frac{1}{2}(1-i\tan(c+dx))\right)}{5ad(e\sec(c+dx))^{5/2}}$$

```
[Out] -1/5*I*2^(-1/4+n)*hypergeom([-5/4, 9/4-n],[-1/4],1/2-1/2*I*tan(d*x+c))*(1+I
*tan(d*x+c))^(1/4-n)*(a+I*a*tan(d*x+c))^(1+n)/a/d/(e*sec(d*x+c))^(5/2)
```

Rubi [A] time = 0.21, antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3505, 3523, 70, 69}

$$-\frac{i2^{n-\frac{1}{4}}(1+i\tan(c+dx))^{\frac{1}{4}-n}(a+ia\tan(c+dx))^{n+1}\text{Hypergeometric2F1}\left(-\frac{5}{4},\frac{9}{4}-n,-\frac{1}{4},\frac{1}{2}(1-i\tan(c+dx))\right)}{5ad(e\sec(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^n/(e*Sec[c + d*x])^(5/2),x]
```

```
[Out] ((-I/5)*2^(-1/4 + n)*Hypergeometric2F1[-5/4, 9/4 - n, -1/4, (1 - I*Tan[c +
d*x])/2]*(1 + I*Tan[c + d*x])^(1/4 - n)*(a + I*a*Tan[c + d*x])^(1 + n))/(a*
d*(e*Sec[c + d*x])^(5/2))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(a+ia\tan(c+dx))^n}{(e\sec(c+dx))^{5/2}}\,dx = \frac{\left((a-ia\tan(c+dx))^{5/4}(a+ia\tan(c+dx))^{5/4}\right)\int \frac{(a+ia\tan(c+dx))^{-\frac{5}{4}+n}}{(a-ia\tan(c+dx))^{5/4}}\,dx}{(e\sec(c+dx))^{5/2}}$$

$$= \frac{\left(a^2(a-ia\tan(c+dx))^{5/4}(a+ia\tan(c+dx))^{5/4}\right)\text{Subst}\left(\int \frac{(a+iax)^{-\frac{9}{4}+n}}{(a-iax)^{9/4}}\,dx, x, \tan(c+\right.}{d(e\sec(c+dx))^{5/2}}$$

$$= \frac{\left(2^{-\frac{9}{4}+n}(a-ia\tan(c+dx))^{5/4}(a+ia\tan(c+dx))^{1+n}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{\frac{1}{4}-n}\right)\text{Subst}\left(\int \frac{\left(\frac{1}{2}\right.}{(\ldots}\right.}{d(e\sec(c+dx))^{5/2}}$$

$$= -\frac{i2^{-\frac{1}{4}+n}\,{}_2F_1\left(-\frac{5}{4},\frac{9}{4}-n;-\frac{1}{4};\frac{1}{2}(1-i\tan(c+dx))\right)(1+i\tan(c+dx))^{\frac{1}{4}-n}(a+ia\tan(c}{5ad(e\sec(c+dx))^{5/2}}$$

Mathematica [A] time = 10.59, size = 147, normalized size = 1.50

$$-\frac{i2^{n-\frac{3}{2}}e^{-3i(c+dx)}\left(1+e^{2i(c+dx)}\right)^4\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{n+\frac{1}{2}}{}_2F_1\left(1,\frac{9}{4};n-\frac{1}{4};-e^{2i(c+dx)}\right)\sec^{\frac{1}{2}-n}(c+dx)(a+ia\tan(c+dx))^n}{de^2(4n-5)\sqrt{e\sec(c+dx)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^n/(e*Sec[c + d*x])^(5/2),x]
```

```
[Out] ((-I)*2^(-3/2 + n)*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x))))^(1/2 + n)*(1
 + E^((2*I)*(c + d*x)))^4*Hypergeometric2F1[1, 9/4, -1/4 + n, -E^((2*I)*(c
+ d*x))]*Sec[c + d*x]^(1/2 - n)*(a + I*a*Tan[c + d*x])^n)/(d*e^2*E^((3*I)*(
c + d*x))*(-5 + 4*n)*Sqrt[e*Sec[c + d*x]])
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{2}\left(\frac{2\,ae^{(2i\,dx+2i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^n\sqrt{\frac{e}{e^{(2i\,dx+2i\,c)}+1}}\left(e^{(6i\,dx+6i\,c)}+3\,e^{(4i\,dx+4i\,c)}+3\,e^{(2i\,dx+2i\,c)}+1\right)e^{\left(-\frac{5}{2}i\,dx-\frac{5}{2}i\,c\right)}}{8\,e^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^n/(e*sec(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] integral(1/8*sqrt(2)*(2*a*e^(2*I*d*x + 2*I*c)/(e^(2*I*d*x + 2*I*c) + 1))^n*
sqrt(e/(e^(2*I*d*x + 2*I*c) + 1))*(e^(6*I*d*x + 6*I*c) + 3*e^(4*I*d*x + 4*I
*c) + 3*e^(2*I*d*x + 2*I*c) + 1)*e^(-5/2*I*d*x - 5/2*I*c)/e^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(i\,a\tan(dx+c)+a)^n}{(e\sec(dx+c))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^n/(e*sec(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n/(e*sec(d*x + c))^(5/2), x)
```

maple [F] time = 0.83, size = 0, normalized size = 0.00

$$\int \frac{(a+ia\tan(dx+c))^n}{(e\sec(dx+c))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^n/(e*sec(d*x+c))^(5/2),x)
[Out] int((a+I*a*tan(d*x+c))^n/(e*sec(d*x+c))^(5/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(i\,a\tan(dx+c)+a)^n}{(e\sec(dx+c))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^n/(e*sec(d*x+c))^(5/2),x, algorithm="maxima")
[Out] integrate((I*a*tan(d*x + c) + a)^n/(e*sec(d*x + c))^(5/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+a\tan(c+d\,x)\,1\mathrm{i})^n}{\left(\frac{e}{\cos(c+d\,x)}\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^n/(e/cos(c + d*x))^(5/2),x)
[Out] int((a + a*tan(c + d*x)*1i)^n/(e/cos(c + d*x))^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ia(\tan(c+dx)-i))^n}{(e\sec(c+dx))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**n/(e*sec(d*x+c))**(5/2),x)
[Out] Integral((I*a*(tan(c + d*x) - I))**n/(e*sec(c + d*x))**(5/2), x)
```

3.483 $\int (e\sec(c+dx))^{-4-n}(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=269

$$-\frac{24i(a+ia\tan(c+dx))^{n+4}(e\sec(c+dx))^{-n-4}}{a^4dn\left(n^4-20n^2+64\right)}+\frac{24i(a+ia\tan(c+dx))^{n+3}(e\sec(c+dx))^{-n-4}}{a^3d(4-n)n\left(4-n^2\right)}-\frac{12i(a+ia\tan(c+\ldots}{a^2d(2\ldots}$$

```
[Out] I*(e*sec(d*x+c))^(-4-n)*(a+I*a*tan(d*x+c))^n/d/(4-n)+4*I*(e*sec(d*x+c))^(-4
-n)*(a+I*a*tan(d*x+c))^(1+n)/a/d/(n^2-6*n+8)-12*I*(e*sec(d*x+c))^(-4-n)*(a+
I*a*tan(d*x+c))^(2+n)/a^2/d/(2-n)/(4-n)/n+24*I*(e*sec(d*x+c))^(-4-n)*(a+I*a
*tan(d*x+c))^(3+n)/a^3/d/(4-n)/n/(-n^2+4)-24*I*(e*sec(d*x+c))^(-4-n)*(a+I*a
*tan(d*x+c))^(4+n)/a^4/d/n/(n^4-20*n^2+64)
```

Rubi [A] time = 0.41, antiderivative size = 269, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$, Rules used = {3504, 3488}

$$\frac{24i(a+ia\tan(c+dx))^{n+3}(e\sec(c+dx))^{-n-4}}{a^3d(4-n)n\left(4-n^2\right)}-\frac{24i(a+ia\tan(c+dx))^{n+4}(e\sec(c+dx))^{-n-4}}{a^4dn\left(n^4-20n^2+64\right)}-\frac{12i(a+ia\tan(c+d\ldots}{a^2d(2-\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(-4 - n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] (I*(e*Sec[c + d*x])^(-4 - n)*(a + I*a*Tan[c + d*x])^n)/(d*(4 - n)) + ((4*I)
*(e*Sec[c + d*x])^(-4 - n)*(a + I*a*Tan[c + d*x])^(1 + n))/(a*d*(8 - 6*n +
n^2)) - ((12*I)*(e*Sec[c + d*x])^(-4 - n)*(a + I*a*Tan[c + d*x])^(2 + n))/(
a^2*d*(2 - n)*(4 - n)*n) + ((24*I)*(e*Sec[c + d*x])^(-4 - n)*(a + I*a*Tan[c
 + d*x])^(3 + n))/(a^3*d*(4 - n)*n*(4 - n^2)) - ((24*I)*(e*Sec[c + d*x])^(-
4 - n)*(a + I*a*Tan[c + d*x])^(4 + n))/(a^4*d*n*(64 - 20*n^2 + n^4))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3504

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m, n},
 x] && EqQ[a^2 + b^2, 0] && ILtQ[Simplify[m + n], 0] && NeQ[m + 2*n, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^{-4-n}(a+ia\tan(c+dx))^n\,dx = \frac{i(e\sec(c+dx))^{-4-n}(a+ia\tan(c+dx))^n}{d(4-n)} + \frac{4\int(e\sec(c+dx))^{-}}{}$$
$$= \frac{i(e\sec(c+dx))^{-4-n}(a+ia\tan(c+dx))^n}{d(4-n)} + \frac{4i(e\sec(c+dx))^{-4-}}{ad\left(8\right.}$$
$$= \frac{i(e\sec(c+dx))^{-4-n}(a+ia\tan(c+dx))^n}{d(4-n)} + \frac{4i(e\sec(c+dx))^{-4-}}{ad\left(8\right.}$$
$$= \frac{i(e\sec(c+dx))^{-4-n}(a+ia\tan(c+dx))^n}{d(4-n)} + \frac{4i(e\sec(c+dx))^{-4-}}{ad\left(8\right.}$$
$$= \frac{i(e\sec(c+dx))^{-4-n}(a+ia\tan(c+dx))^n}{d(4-n)} + \frac{4i(e\sec(c+dx))^{-4-}}{ad\left(8\right.}$$

Mathematica [A] time = 0.68, size = 165, normalized size = 0.61

$$-\frac{i(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-n}\left(-8in^3\sin(2(c+dx))-4in^3\sin(4(c+dx))+4\left(n^2-16\right)n^2\cos(2(c+\right.}{8de^4(n-4)(n-2)n(n}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(-4 - n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-1/8*I)*(192 - 60*n^2 + 3*n^4 + 4*n^2*(-16 + n^2)*Cos[2*(c + d*x)] + n^2*
(-4 + n^2)*Cos[4*(c + d*x)] + (128*I)*n*Sin[2*(c + d*x)] - (8*I)*n^3*Sin[2*
(c + d*x)] + (16*I)*n*Sin[4*(c + d*x)] - (4*I)*n^3*Sin[4*(c + d*x)])*(a + I
*a*Tan[c + d*x])^n)/(d*e^4*(-4 + n)*(-2 + n)*n*(2 + n)*(4 + n)*(e*Sec[c + d
*x])^n)
```

fricas [A] time = 1.10, size = 332, normalized size = 1.23

$$\frac{\left(-i\,n^4-4i\,n^3+4i\,n^2+\left(-i\,n^4+4i\,n^3+4i\,n^2-16i\,n\right)e^{(8i\,dx+8i\,c)}+\left(-4i\,n^4+8i\,n^3+64i\,n^2-128i\,n\right)e^{(6i\,dx+6i\,c)}\right.}{dn^5-20\,dn^3+64\,dn+\left(dn^5-20\,dn^3+64\,dn\right)e^{(8i\,dx+8i\,c)}+4\left(dn^5-\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(-4-n)*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] (-I*n^4 - 4*I*n^3 + 4*I*n^2 + (-I*n^4 + 4*I*n^3 + 4*I*n^2 - 16*I*n)*e^(8*I*
d*x + 8*I*c) + (-4*I*n^4 + 8*I*n^3 + 64*I*n^2 - 128*I*n)*e^(6*I*d*x + 6*I*c
) + (-6*I*n^4 + 120*I*n^2 - 384*I)*e^(4*I*d*x + 4*I*c) + (-4*I*n^4 - 8*I*n^
3 + 64*I*n^2 + 128*I*n)*e^(2*I*d*x + 2*I*c) + 16*I*n)*(2*e*e^(I*d*x + I*c)/
(e^(2*I*d*x + 2*I*c) + 1))^(-n - 4)*e^(I*d*n*x + I*c*n + n*log(2*e*e^(I*d*x
 + I*c)/(e^(2*I*d*x + 2*I*c) + 1)) + n*log(a/e))/(d*n^5 - 20*d*n^3 + 64*d*n
 + (d*n^5 - 20*d*n^3 + 64*d*n)*e^(8*I*d*x + 8*I*c) + 4*(d*n^5 - 20*d*n^3 +
64*d*n)*e^(6*I*d*x + 6*I*c) + 6*(d*n^5 - 20*d*n^3 + 64*d*n)*e^(4*I*d*x + 4*
I*c) + 4*(d*n^5 - 20*d*n^3 + 64*d*n)*e^(2*I*d*x + 2*I*c))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{-n-4}(i\,a\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(-4-n)*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(-n - 4)*(I*a*tan(d*x + c) + a)^n, x)
```

maple [C] time = 2.50, size = 5823, normalized size = 21.65

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(-4-n)*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] result too large to display
```

maxima [A] time = 1.27, size = 432, normalized size = 1.61

$$\frac{\left(-i a^n n^4 + 4i a^n n^3 + 4i a^n n^2 - 16i a^n n\right)\cos\left((dx+c)(n+4)\right) + \left(-4i a^n n^4 + 8i a^n n^3 + 64i a^n n^2 - 128i a^n n\right)\cos\left((d\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(-4-n)*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] 1/16*((-I*a^n*n^4 + 4*I*a^n*n^3 + 4*I*a^n*n^2 - 16*I*a^n*n)*cos((d*x + c)*(
n + 4)) + (-4*I*a^n*n^4 + 8*I*a^n*n^3 + 64*I*a^n*n^2 - 128*I*a^n*n)*cos((d*
x + c)*(n + 2)) + (-4*I*a^n*n^4 - 8*I*a^n*n^3 + 64*I*a^n*n^2 + 128*I*a^n*n)
*cos((d*x + c)*(n - 2)) + (-I*a^n*n^4 - 4*I*a^n*n^3 + 4*I*a^n*n^2 + 16*I*a^
n*n)*cos((d*x + c)*(n - 4)) + (-6*I*a^n*n^4 + 120*I*a^n*n^2 - 384*I*a^n)*co
s((d*x + c)*n) + (a^n*n^4 - 4*a^n*n^3 - 4*a^n*n^2 + 16*a^n*n)*sin((d*x + c)
*(n + 4)) + 4*(a^n*n^4 - 2*a^n*n^3 - 16*a^n*n^2 + 32*a^n*n)*sin((d*x + c)*(
n + 2)) + 4*(a^n*n^4 + 2*a^n*n^3 - 16*a^n*n^2 - 32*a^n*n)*sin((d*x + c)*(n
- 2)) + (a^n*n^4 + 4*a^n*n^3 - 4*a^n*n^2 - 16*a^n*n)*sin((d*x + c)*(n - 4))
 + 6*(a^n*n^4 - 20*a^n*n^2 + 64*a^n)*sin((d*x + c)*n))/((e^(n + 4)*n^5 - 20
*e^(n + 4)*n^3 + 64*e^(n + 4)*n)*d)
```

mupad [B] time = 9.90, size = 511, normalized size = 1.90

$$\frac{\left(2\sin\left(2c+2dx\right)^2+\sin\left(4c+4dx\right)1\mathrm{i}-1\right)\left(\frac{\left(a-\frac{a\sin(c+dx)1\mathrm{i}}{2\sin\left(\frac{c}{2}+\frac{dx}{2}\right)^2-1}\right)^n\left(-n^3-4n^2+4n+16\right)}{d\left(n^4 1\mathrm{i}-n^2 20\mathrm{i}+64\mathrm{i}\right)}+\frac{4\left(a-\frac{a\sin(c+dx)1\mathrm{i}}{2\sin\left(\frac{c}{2}+\frac{dx}{2}\right)^2-1}\right)^n\left(-2\sin(c+dx)^2+\mathrm{s}\right.}{d\left(n^4 1\mathrm{i}-n^2\right.}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^n/(e/cos(c + d*x))^(n + 4),x)
```

```
[Out] ((sin(4*c + 4*d*x)*1i + 2*sin(2*c + 2*d*x)^2 - 1)*(((a - (a*sin(c + d*x)*1i
)/(2*sin(c/2 + (d*x)/2)^2 - 1))^n*(4*n - 4*n^2 - n^3 + 16))/(d*(n^4*1i - n^
2*20i + 64i)) + (4*(a - (a*sin(c + d*x)*1i)/(2*sin(c/2 + (d*x)/2)^2 - 1))^n
*(sin(2*c + 2*d*x)*1i - 2*sin(c + d*x)^2 + 1)*(16*n - 2*n^2 - n^3 + 32))/(d
*(n^4*1i - n^2*20i + 64i)) + ((a - (a*sin(c + d*x)*1i)/(2*sin(c/2 + (d*x)/2
)^2 - 1))^n*(sin(8*c + 8*d*x)*1i - 2*sin(4*c + 4*d*x)^2 + 1)*(4*n + 4*n^2 -
 n^3 - 16))/(d*(n^4*1i - n^2*20i + 64i)) + (4*(a - (a*sin(c + d*x)*1i)/(2*s
in(c/2 + (d*x)/2)^2 - 1))^n*(sin(6*c + 6*d*x)*1i - 2*sin(3*c + 3*d*x)^2 + 1
)*(16*n + 2*n^2 - n^3 - 32))/(d*(n^4*1i - n^2*20i + 64i)) - ((a - (a*sin(c
+ d*x)*1i)/(2*sin(c/2 + (d*x)/2)^2 - 1))^n*(sin(4*c + 4*d*x)*1i - 2*sin(2*c
 + 2*d*x)^2 + 1)*(6*n^4 - 120*n^2 + 384))/(d*n*(n^4*1i - n^2*20i + 64i))))/
(16*(-e/(2*sin(c/2 + (d*x)/2)^2 - 1))^(n + 4)*(sin(c + d*x)^2 - 1)^2)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(-4-n)*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Timed out
```

3.484 $\int (e\sec(c+dx))^{-3-n}(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=205

$$\frac{6i(a+ia\tan(c+dx))^{n+3}(e\sec(c+dx))^{-n-3}}{a^3d\left(n^4-10n^2+9\right)}-\frac{6i(a+ia\tan(c+dx))^{n+2}(e\sec(c+dx))^{-n-3}}{a^2d(3-n)\left(1-n^2\right)}+\frac{3i(a+ia\tan(c+dx))^{n}}{ad\left(n^2-\right.}$$

```
[Out] I*(e*sec(d*x+c))^(-3-n)*(a+I*a*tan(d*x+c))^n/d/(3-n)+3*I*(e*sec(d*x+c))^(-3
-n)*(a+I*a*tan(d*x+c))^(1+n)/a/d/(n^2-4*n+3)-6*I*(e*sec(d*x+c))^(-3-n)*(a+I
*a*tan(d*x+c))^(2+n)/a^2/d/(3-n)/(-n^2+1)+6*I*(e*sec(d*x+c))^(-3-n)*(a+I*a*
tan(d*x+c))^(3+n)/a^3/d/(n^4-10*n^2+9)
```

Rubi [A] time = 0.30, antiderivative size = 205, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$, Rules used = {3504, 3488}

$$-\frac{6i(a+ia\tan(c+dx))^{n+2}(e\sec(c+dx))^{-n-3}}{a^2d(3-n)\left(1-n^2\right)}+\frac{6i(a+ia\tan(c+dx))^{n+3}(e\sec(c+dx))^{-n-3}}{a^3d\left(n^4-10n^2+9\right)}+\frac{3i(a+ia\tan(c+dx)}{ad\left(n^2\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(-3 - n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] (I*(e*Sec[c + d*x])^(-3 - n)*(a + I*a*Tan[c + d*x])^n)/(d*(3 - n)) + ((3*I)
*(e*Sec[c + d*x])^(-3 - n)*(a + I*a*Tan[c + d*x])^(1 + n))/(a*d*(3 - 4*n +
n^2)) - ((6*I)*(e*Sec[c + d*x])^(-3 - n)*(a + I*a*Tan[c + d*x])^(2 + n))/(a
^2*d*(3 - n)*(1 - n^2)) + ((6*I)*(e*Sec[c + d*x])^(-3 - n)*(a + I*a*Tan[c +
 d*x])^(3 + n))/(a^3*d*(9 - 10*n^2 + n^4))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3504

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m, n},
 x] && EqQ[a^2 + b^2, 0] && ILtQ[Simplify[m + n], 0] && NeQ[m + 2*n, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^{-3-n}(a+ia\tan(c+dx))^n\,dx=\frac{i(e\sec(c+dx))^{-3-n}(a+ia\tan(c+dx))^n}{d(3-n)}+\frac{3\int(e\sec(c+dx))^{-3-n}}{a(}$$
$$=\frac{i(e\sec(c+dx))^{-3-n}(a+ia\tan(c+dx))^n}{d(3-n)}+\frac{3i(e\sec(c+dx))^{-3-n}(}{ad\left(3-4\right.}$$
$$=\frac{i(e\sec(c+dx))^{-3-n}(a+ia\tan(c+dx))^n}{d(3-n)}+\frac{3i(e\sec(c+dx))^{-3-n}(}{ad\left(3-4\right.}$$
$$=\frac{i(e\sec(c+dx))^{-3-n}(a+ia\tan(c+dx))^n}{d(3-n)}+\frac{3i(e\sec(c+dx))^{-3-n}(}{ad\left(3-4\right.}$$

Mathematica [A] time = 0.66, size = 119, normalized size = 0.58

$$\frac{(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-n}\left(-3in\left(n^2-9\right)\cos(c+dx)-in\left(n^2-1\right)\cos(3(c+dx))-6\sin(c+dx)\left(\left(\right.\right.}{4de^3(n-3)(n-1)(n+1)(n+3)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(-3 - n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] (((-3*I)*n*(-9 + n^2)*Cos[c + d*x] - I*n*(-1 + n^2)*Cos[3*(c + d*x)] - 6*(-
5 + n^2 + (-1 + n^2)*Cos[2*(c + d*x)])*Sin[c + d*x])*(a + I*a*Tan[c + d*x])
^n)/(4*d*e^3*(-3 + n)*(-1 + n)*(1 + n)*(3 + n)*(e*Sec[c + d*x])^n)
```

fricas [A] time = 0.58, size = 263, normalized size = 1.28

$$\frac{\left(-in^3-3in^2+\left(-in^3+3in^2+in-3i\right)e^{(6idx+6ic)}+\left(-3in^3+3in^2+27in-27i\right)e^{(4idx+4ic)}+\left(-3in^3-3in^2\right.\right.}{dn^4-10dn^2+\left(dn^4-10dn^2+9d\right)e^{(6idx+6ic)}+3\left(dn^4-10dn^2+9d\right)e^{(}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(-3-n)*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] (-I*n^3 - 3*I*n^2 + (-I*n^3 + 3*I*n^2 + I*n - 3*I)*e^(6*I*d*x + 6*I*c) + (-
3*I*n^3 + 3*I*n^2 + 27*I*n - 27*I)*e^(4*I*d*x + 4*I*c) + (-3*I*n^3 - 3*I*n^
2 + 27*I*n + 27*I)*e^(2*I*d*x + 2*I*c) + I*n + 3*I)*(2*e*e^(I*d*x + I*c)/(e
^(2*I*d*x + 2*I*c) + 1))^(-n - 3)*e^(I*d*n*x + I*c*n + n*log(2*e*e^(I*d*x +
 I*c)/(e^(2*I*d*x + 2*I*c) + 1)) + n*log(a/e))/(d*n^4 - 10*d*n^2 + (d*n^4 -
 10*d*n^2 + 9*d)*e^(6*I*d*x + 6*I*c) + 3*(d*n^4 - 10*d*n^2 + 9*d)*e^(4*I*d*
x + 4*I*c) + 3*(d*n^4 - 10*d*n^2 + 9*d)*e^(2*I*d*x + 2*I*c) + 9*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int(e\sec(dx+c))^{-n-3}(ia\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(-3-n)*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(-n - 3)*(I*a*tan(d*x + c) + a)^n, x)
```

maple [C] time = 2.18, size = 4994, normalized size = 24.36

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(-3-n)*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] 1/8/(-3*I*d+I*n*d)*exp(I*(d*x+c))^n*a^n/e^3*e^(-n)*exp(-1/2*I*(6*c+6*d*x-2*
csgn(I*exp(2*I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c)))*Pi*n+n*Pi*csgn(I*e/(exp(2
*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1)
)+n*Pi*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))
+1))^2+n*Pi*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+
1))^2-3*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))*csgn(I*e)*csgn(I*e
xp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))-3*Pi*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(
I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))-csgn(I*a/(exp
(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*csgn(I*a)*Pi*n-csgn(I*exp(2*I*(d*x+c))
)*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*Pi*n+csgn(I*exp(2*I*(d*x+
c)))*csgn(I*exp(I*(d*x+c)))^2*Pi*n-csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c)
)+1))^2*csgn(I/(exp(2*I*(d*x+c))+1))*Pi*n-csgn(I*exp(2*I*(d*x+c))/(exp(2*I*
```

```
(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*Pi*n+n*Pi*cs
gn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn(I*e)-n*Pi*csgn(I*e/(exp(
2*I*(d*x+c))+1)*exp(I*(d*x+c)))*csgn(I*e)*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d
*x+c))+1))-n*Pi*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x+c)))*csgn(I*
exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))+csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(2*
I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I/(exp(2*I*(d*x+c))+1))*Pi*n+csgn(I*e
xp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I
*(d*x+c)))*csgn(I*a)*Pi*n-n*Pi*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^
3+3*Pi*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2
+csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^3*Pi*n-n*Pi*csgn(I*e/(exp(2*
I*(d*x+c))+1)*exp(I*(d*x+c)))^3+csgn(I*exp(2*I*(d*x+c)))^3*Pi*n-3*Pi*csgn(I
*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^3-3*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*
exp(I*(d*x+c)))^3+3*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn
(I*e)+3*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn(I*exp(I*(d*
x+c))/(exp(2*I*(d*x+c))+1))+3*Pi*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*
(d*x+c))/(exp(2*I*(d*x+c))+1))^2+csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x
+c)))^3*Pi*n))+1/8/(I*n*d+3*I*d)*exp(I*(d*x+c))^n*a^n/e^3*e^(-n)*exp(1/2*I*
(6*c+6*d*x+2*csgn(I*exp(2*I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c)))*Pi*n-n*Pi*cs
gn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c))/(exp(2*
I*(d*x+c))+1))-n*Pi*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x+c))/(exp
(2*I*(d*x+c))+1))^2-n*Pi*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(
2*I*(d*x+c))+1))^2+3*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))*csgn(
I*e)*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))+3*Pi*csgn(I/(exp(2*I*(d*x+
c))+1))*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))+
csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*csgn(I*a)*Pi*n+csgn(I*exp
(2*I*(d*x+c)))*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*Pi*n-csgn(I*
exp(2*I*(d*x+c)))*csgn(I*exp(I*(d*x+c)))^2*Pi*n+csgn(I*exp(2*I*(d*x+c))/(ex
p(2*I*(d*x+c))+1))^2*csgn(I/(exp(2*I*(d*x+c))+1))*Pi*n+csgn(I*exp(2*I*(d*x+
c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2
*Pi*n-n*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn(I*e)+n*Pi*c
sgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))*csgn(I*e)*csgn(I*exp(I*(d*x+c)
)/(exp(2*I*(d*x+c))+1))+n*Pi*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x
+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))-csgn(I*exp(2*I*(d*x+c)))*
csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I/(exp(2*I*(d*x+c))+1))*
Pi*n-csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c
))+1)*exp(2*I*(d*x+c)))*csgn(I*a)*Pi*n+n*Pi*csgn(I*exp(I*(d*x+c))/(exp(2*I*
(d*x+c))+1))^3-3*Pi*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(
d*x+c))+1))^2-csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^3*Pi*n+n*Pi*csg
n(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^3-csgn(I*exp(2*I*(d*x+c)))^3*Pi*
n+3*Pi*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^3+3*Pi*csgn(I*e/(exp(2*I
*(d*x+c))+1)*exp(I*(d*x+c)))^3-3*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*
x+c)))^2*csgn(I*e)-3*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csg
n(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))-3*Pi*csgn(I/(exp(2*I*(d*x+c))+1))*
csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2-csgn(I*a/(exp(2*I*(d*x+c))+1)
*exp(2*I*(d*x+c)))^3*Pi*n))+3/8/(-I*d+I*n*d)*exp(I*(d*x+c))^n*a^n/e^3*e^(-n
)*exp(-1/2*I*(2*c+2*d*x-2*csgn(I*exp(2*I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c)))
*Pi*n+n*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn(I*exp(I*(d*
x+c))/(exp(2*I*(d*x+c))+1))+n*Pi*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*
(d*x+c))/(exp(2*I*(d*x+c))+1))^2+n*Pi*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(
d*x+c))/(exp(2*I*(d*x+c))+1))^2-3*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d
*x+c)))*csgn(I*e)*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))-3*Pi*csgn(I/(
exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*
(d*x+c))+1))-csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*csgn(I*a)*Pi
*n-csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2
*Pi*n+csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(I*(d*x+c)))^2*Pi*n-csgn(I*exp(2*I
*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*csgn(I/(exp(2*I*(d*x+c))+1))*Pi*n-csgn(I*
exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*
I*(d*x+c)))^2*Pi*n+n*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csg
n(I*e)-n*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))*csgn(I*e)*csgn(I*
```

```
exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))-n*Pi*csgn(I/(exp(2*I*(d*x+c))+1))*csgn
(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))+csgn(I*exp(2
*I*(d*x+c)))*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I/(exp(2*I*
(d*x+c))+1))*Pi*n+csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(e
xp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))*csgn(I*a)*Pi*n-n*Pi*csgn(I*exp(I*(d*x+
c))/(exp(2*I*(d*x+c))+1))^3+3*Pi*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c
))/(exp(2*I*(d*x+c))+1))^2+csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^3*
Pi*n-n*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^3+csgn(I*exp(2*I*(d
*x+c)))^3*Pi*n-3*Pi*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^3-3*Pi*csgn
(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^3+3*Pi*csgn(I*e/(exp(2*I*(d*x+c))
+1)*exp(I*(d*x+c)))^2*csgn(I*e)+3*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d
*x+c)))^2*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))+3*Pi*csgn(I/(exp(2*I*
(d*x+c))+1))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2+csgn(I*a/(exp(2*
I*(d*x+c))+1)*exp(2*I*(d*x+c)))^3*Pi*n))+3/8/(I*d+I*n*d)*exp(I*(d*x+c))^n*a
^n/e^3*e^(-n)*exp(1/2*I*(2*c+2*d*x+2*csgn(I*exp(2*I*(d*x+c)))^2*csgn(I*exp(
I*(d*x+c)))*Pi*n-n*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn(
I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))-n*Pi*csgn(I/(exp(2*I*(d*x+c))+1))*cs
gn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2-n*Pi*csgn(I*exp(I*(d*x+c)))*csg
n(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2+3*Pi*csgn(I*e/(exp(2*I*(d*x+c))+
1)*exp(I*(d*x+c)))*csgn(I*e)*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))+3*
Pi*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c)
)/(exp(2*I*(d*x+c))+1))+csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*c
sgn(I*a)*Pi*n+csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*
x+c))+1))^2*Pi*n-csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(I*(d*x+c)))^2*Pi*n+csg
n(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*csgn(I/(exp(2*I*(d*x+c))+1))*P
i*n+csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c)
)+1)*exp(2*I*(d*x+c)))^2*Pi*n-n*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x
+c)))^2*csgn(I*e)+n*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))*csgn(I
*e)*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))+n*Pi*csgn(I/(exp(2*I*(d*x+c
))+1))*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))-c
sgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(
I/(exp(2*I*(d*x+c))+1))*Pi*n-csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*
csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))*csgn(I*a)*Pi*n+n*Pi*csgn(I*
exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^3-3*Pi*csgn(I*exp(I*(d*x+c)))*csgn(I*e
xp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2-csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x
+c))+1))^3*Pi*n+n*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^3-csgn(I
*exp(2*I*(d*x+c)))^3*Pi*n+3*Pi*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^
3+3*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^3-3*Pi*csgn(I*e/(exp(2
*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn(I*e)-3*Pi*csgn(I*e/(exp(2*I*(d*x+c))+
1)*exp(I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))-3*Pi*csgn(
I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2-csgn(
I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^3*Pi*n))
```

maxima [A] time = 1.09, size = 344, normalized size = 1.68

$$\left(-i\,a^{n}n^{3}+3i\,a^{n}n^{2}+i\,a^{n}n-3i\,a^{n}\right)\cos\left((dx+c)(n+3)\right)+\left(-3i\,a^{n}n^{3}+3i\,a^{n}n^{2}+27i\,a^{n}n-27i\,a^{n}\right)\cos\left((dx+c\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(-3-n)*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] 1/8*((-I*a^n*n^3 + 3*I*a^n*n^2 + I*a^n*n - 3*I*a^n)*cos((d*x + c)*(n + 3))
+ (-3*I*a^n*n^3 + 3*I*a^n*n^2 + 27*I*a^n*n - 27*I*a^n)*cos((d*x + c)*(n + 1
)) + (-3*I*a^n*n^3 - 3*I*a^n*n^2 + 27*I*a^n*n + 27*I*a^n)*cos((d*x + c)*(n
- 1)) + (-I*a^n*n^3 - 3*I*a^n*n^2 + I*a^n*n + 3*I*a^n)*cos((d*x + c)*(n - 3
)) + (a^n*n^3 - 3*a^n*n^2 - a^n*n + 3*a^n)*sin((d*x + c)*(n + 3)) + 3*(a^n*
n^3 - a^n*n^2 - 9*a^n*n + 9*a^n)*sin((d*x + c)*(n + 1)) + 3*(a^n*n^3 + a^n*
n^2 - 9*a^n*n - 9*a^n)*sin((d*x + c)*(n - 1)) + (a^n*n^3 + 3*a^n*n^2 - a^n*
n - 3*a^n)*sin((d*x + c)*(n - 3)))/((e^(n + 3)*n^4 - 10*e^(n + 3)*n^2 + 9*e
^(n + 3))*d)
```

mupad [B] time = 9.24, size = 425, normalized size = 2.07

$$-\frac{\left(2\sin\left(\frac{c}{2}+\frac{dx}{2}\right)^2-1\right)\left(2\sin\left(\frac{3c}{2}+\frac{3dx}{2}\right)^2+\sin(3c+3dx)\,1\mathrm{i}-1\right)\left(\frac{\left(a-\frac{a\sin(c+dx)\,1\mathrm{i}}{2\sin\left(\frac{c}{2}+\frac{dx}{2}\right)^2-1}\right)^n\left(-n^3-3n^2+n+3\right)}{d\left(n^4\,1\mathrm{i}-n^2\,10\mathrm{i}+9\mathrm{i}\right)}+\frac{\left(a-\frac{a\sin(c+d}{2\sin\left(\frac{c}{2}+\frac{d}{2}\right.}\right.}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^n/(e/cos(c + d*x))^(n + 3),x)
```

```
[Out] -((2*sin(c/2 + (d*x)/2)^2 - 1)*(sin(3*c + 3*d*x)*1i + 2*sin((3*c)/2 + (3*d*
x)/2)^2 - 1)*(((a - (a*sin(c + d*x)*1i)/(2*sin(c/2 + (d*x)/2)^2 - 1))^n*(n
- 3*n^2 - n^3 + 3))/(d*(n^4*1i - n^2*10i + 9i)) + ((a - (a*sin(c + d*x)*1i)
/(2*sin(c/2 + (d*x)/2)^2 - 1))^n*(sin(6*c + 6*d*x)*1i - 2*sin(3*c + 3*d*x)^
2 + 1)*(n + 3*n^2 - n^3 - 3))/(d*(n^4*1i - n^2*10i + 9i)) + ((a - (a*sin(c
+ d*x)*1i)/(2*sin(c/2 + (d*x)/2)^2 - 1))^n*(sin(2*c + 2*d*x)*1i - 2*sin(c +
 d*x)^2 + 1)*(27*n - 3*n^2 - 3*n^3 + 27))/(d*(n^4*1i - n^2*10i + 9i)) + ((a
 - (a*sin(c + d*x)*1i)/(2*sin(c/2 + (d*x)/2)^2 - 1))^n*(sin(4*c + 4*d*x)*1i
 - 2*sin(2*c + 2*d*x)^2 + 1)*(27*n + 3*n^2 - 3*n^3 - 27))/(d*(n^4*1i - n^2*
10i + 9i))))/(8*(-e/(2*sin(c/2 + (d*x)/2)^2 - 1))^(n + 3)*(sin(c + d*x)^2 -
 1)^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(c+dx))^{-n-3}\,(ia(\tan(c+dx)-i))^n\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(-3-n)*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Integral((e*sec(c + d*x))**(-n - 3)*(I*a*(tan(c + d*x) - I))**n, x)
```

3.485 $\int (e\sec(c+dx))^{-2-n}(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=148

$$\frac{2i(a+ia\tan(c+dx))^{n+2}(e\sec(c+dx))^{-n-2}}{a^2dn\left(4-n^2\right)}+\frac{i(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-n-2}}{d(2-n)}-\frac{2i(a+ia\tan(c+dx))^n}{ad(2-}$$

```
[Out] I*(e*sec(d*x+c))^(-2-n)*(a+I*a*tan(d*x+c))^n/d/(2-n)-2*I*(e*sec(d*x+c))^(-2
-n)*(a+I*a*tan(d*x+c))^(1+n)/a/d/(2-n)/n+2*I*(e*sec(d*x+c))^(-2-n)*(a+I*a*t
an(d*x+c))^(2+n)/a^2/d/n/(-n^2+4)
```

Rubi [A] time = 0.20, antiderivative size = 148, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {3504, 3488}

$$\frac{2i(a+ia\tan(c+dx))^{n+2}(e\sec(c+dx))^{-n-2}}{a^2dn\left(4-n^2\right)}+\frac{i(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-n-2}}{d(2-n)}-\frac{2i(a+ia\tan(c+dx))^n}{ad(2-}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(-2 - n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] (I*(e*Sec[c + d*x])^(-2 - n)*(a + I*a*Tan[c + d*x])^n)/(d*(2 - n)) - ((2*I)
*(e*Sec[c + d*x])^(-2 - n)*(a + I*a*Tan[c + d*x])^(1 + n))/(a*d*(2 - n)*n)
+ ((2*I)*(e*Sec[c + d*x])^(-2 - n)*(a + I*a*Tan[c + d*x])^(2 + n))/(a^2*d*n
*(4 - n^2))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3504

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m, n},
 x] && EqQ[a^2 + b^2, 0] && ILtQ[Simplify[m + n], 0] && NeQ[m + 2*n, 0]
```

Rubi steps

$$\begin{aligned}\int (e\sec(c+dx))^{-2-n}(a+ia\tan(c+dx))^n\,dx &= \frac{i(e\sec(c+dx))^{-2-n}(a+ia\tan(c+dx))^n}{d(2-n)}+\frac{2\int (e\sec(c+dx))^{-}}{}\\ &= \frac{i(e\sec(c+dx))^{-2-n}(a+ia\tan(c+dx))^n}{d(2-n)}-\frac{2i(e\sec(c+dx))^{-2-}}{ad(}\\ &= \frac{i(e\sec(c+dx))^{-2-n}(a+ia\tan(c+dx))^n}{d(2-n)}-\frac{2i(e\sec(c+dx))^{-2-}}{ad(}\end{aligned}$$

Mathematica [A] time = 0.26, size = 82, normalized size = 0.55

$$-\frac{i(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-n}\left(n^2\cos(2(c+dx))-2in\sin(2(c+dx))+n^2-4\right)}{2de^2(n-2)n(n+2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(-2 - n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-1/2*I)*(-4 + n^2 + n^2*Cos[2*(c + d*x)] - (2*I)*n*Sin[2*(c + d*x)])*(a +
 I*a*Tan[c + d*x])^n)/(d*e^2*(-2 + n)*n*(2 + n)*(e*Sec[c + d*x])^n)
```

fricas [A] time = 0.53, size = 177, normalized size = 1.20

$$\frac{\left(-i\,n^2+\left(-i\,n^2+2i\,n\right)e^{(4i\,dx+4i\,c)}+\left(-2i\,n^2+8i\right)e^{(2i\,dx+2i\,c)}-2i\,n\right)\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^{-n-2}e^{\left(i\,dnx+i\,cn+n\log\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)+n\log\right.}}{dn^3-4\,dn+\left(dn^3-4\,dn\right)e^{(4i\,dx+4i\,c)}+2\left(dn^3-4\,dn\right)e^{(2i\,dx+2i\,c)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(-2-n)*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] (-I*n^2 + (-I*n^2 + 2*I*n)*e^(4*I*d*x + 4*I*c) + (-2*I*n^2 + 8*I)*e^(2*I*d*
x + 2*I*c) - 2*I*n)*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^(-n - 2
)*e^(I*d*n*x + I*c*n + n*log(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))
 + n*log(a/e))/(d*n^3 - 4*d*n + (d*n^3 - 4*d*n)*e^(4*I*d*x + 4*I*c) + 2*(d*
n^3 - 4*d*n)*e^(2*I*d*x + 2*I*c))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{-n-2}\,(i\,a\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(-2-n)*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(-n - 2)*(I*a*tan(d*x + c) + a)^n, x)
```

maple [C] time = 1.84, size = 3327, normalized size = 22.48

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(-2-n)*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] 1/4/(-2*I*d+I*n*d)*exp(I*(d*x+c))^n*a^n/e^2*e^(-n)*exp(-1/2*I*(4*c+4*d*x-2*
csgn(I*exp(2*I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c)))*Pi*n+n*Pi*csgn(I*e/(exp(2
*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1)
)+n*Pi*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))
+1))^2+n*Pi*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+
1))^2-2*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))*csgn(I*e)*csgn(I*e
xp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))-2*Pi*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(
I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))-csgn(I*a/(exp
(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*csgn(I*a)*Pi*n-csgn(I*exp(2*I*(d*x+c))
)*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*Pi*n+csgn(I*exp(2*I*(d*x+
c)))*csgn(I*exp(I*(d*x+c)))^2*Pi*n-csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c)
)+1))^2*csgn(I/(exp(2*I*(d*x+c))+1))*Pi*n-csgn(I*exp(2*I*(d*x+c))/(exp(2*I*
(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*Pi*n+n*Pi*cs
gn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn(I*e)-n*Pi*csgn(I*e/(exp(
2*I*(d*x+c))+1)*exp(I*(d*x+c)))*csgn(I*e)*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d
*x+c))+1))-n*Pi*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x+c)))*csgn(I*
exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))+csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(2*
I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I/(exp(2*I*(d*x+c))+1))*Pi*n+csgn(I*e
xp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I
*(d*x+c)))*csgn(I*a)*Pi*n-n*Pi*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^
```

```
3+2*Pi*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2
+csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^3*Pi*n-n*Pi*csgn(I*e/(exp(2*
I*(d*x+c))+1)*exp(I*(d*x+c)))^3+csgn(I*exp(2*I*(d*x+c)))^3*Pi*n-2*Pi*csgn(I
*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^3-2*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*
exp(I*(d*x+c)))^3+2*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn
(I*e)+2*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn(I*exp(I*(d*
x+c))/(exp(2*I*(d*x+c))+1))+2*Pi*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*
(d*x+c))/(exp(2*I*(d*x+c))+1))^2+csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x
+c)))^3*Pi*n))+1/4/(2*I*d+I*n*d)*exp(I*(d*x+c))^n*a^n/e^2*e^(-n)*exp(1/2*I*
(4*c+4*d*x+2*csgn(I*exp(2*I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c)))*Pi*n-n*Pi*cs
gn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c))/(exp(2*
I*(d*x+c))+1))-n*Pi*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x+c))/(exp
(2*I*(d*x+c))+1))^2-n*Pi*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(
2*I*(d*x+c))+1))^2+2*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))*csgn(
I*e)*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))+2*Pi*csgn(I/(exp(2*I*(d*x+
c))+1))*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))+
csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*csgn(I*a)*Pi*n+csgn(I*exp
(2*I*(d*x+c)))*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*Pi*n-csgn(I*
exp(2*I*(d*x+c)))*csgn(I*exp(I*(d*x+c)))^2*Pi*n+csgn(I*exp(2*I*(d*x+c))/(ex
p(2*I*(d*x+c))+1))^2*csgn(I/(exp(2*I*(d*x+c))+1))*Pi*n+csgn(I*exp(2*I*(d*x+
c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2
*Pi*n-n*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn(I*e)+n*Pi*c
sgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))*csgn(I*e)*csgn(I*exp(I*(d*x+c)
)/(exp(2*I*(d*x+c))+1))+n*Pi*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x
+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))-csgn(I*exp(2*I*(d*x+c)))*
csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I/(exp(2*I*(d*x+c))+1))*
Pi*n-csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c
))+1)*exp(2*I*(d*x+c)))*csgn(I*a)*Pi*n+n*Pi*csgn(I*exp(I*(d*x+c))/(exp(2*I*
(d*x+c))+1))^3-2*Pi*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(
d*x+c))+1))^2-csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^3*Pi*n+n*Pi*csg
n(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^3-csgn(I*exp(2*I*(d*x+c)))^3*Pi*
n+2*Pi*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^3+2*Pi*csgn(I*e/(exp(2*I
*(d*x+c))+1)*exp(I*(d*x+c)))^3-2*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*
x+c)))^2*csgn(I*e)-2*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csg
n(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))-2*Pi*csgn(I/(exp(2*I*(d*x+c))+1))*
csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2-csgn(I*a/(exp(2*I*(d*x+c))+1)
*exp(2*I*(d*x+c)))^3*Pi*n))-1/2*I/d/n/e^2/(e^n)*a^n*exp(I*(d*x+c))^n*exp(1/
2*I*n*Pi*(-csgn(I*exp(2*I*(d*x+c)))^3+2*csgn(I*exp(2*I*(d*x+c)))^2*csgn(I*e
xp(I*(d*x+c)))+csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d
*x+c))+1))^2-csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x
+c))+1))*csgn(I/(exp(2*I*(d*x+c))+1))-csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(I
*(d*x+c)))^2-csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^3+csgn(I*exp(2*I
*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*csgn(I/(exp(2*I*(d*x+c))+1))+csgn(I*exp(2
*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*
x+c)))^2-csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d
*x+c))+1)*exp(2*I*(d*x+c)))*csgn(I*a)-csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I
*(d*x+c)))^3+csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*csgn(I*a)+cs
gn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^3-csgn(I*e/(exp(2*I*(d*x+c))+1)
*exp(I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))-csgn(I*e/(ex
p(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn(I*e)+csgn(I*e/(exp(2*I*(d*x+c))+1)
*exp(I*(d*x+c)))*csgn(I*e)*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))+csgn
(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(
2*I*(d*x+c))+1))-csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x+c))/(exp(2*
I*(d*x+c))+1))^2-csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x
+c))+1))^2+csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^3))
```

maxima [A] time = 0.73, size = 174, normalized size = 1.18

$$\frac{\left(-i\,a^{n}n^{2}+2i\,a^{n}n\right)\cos\left((dx+c)(n+2)\right)+\left(-i\,a^{n}n^{2}-2i\,a^{n}n\right)\cos\left((dx+c)(n-2)\right)+\left(-2i\,a^{n}n^{2}+8i\,a^{n}\right)\cos\left((d\right.}{4\left(e^{n+2}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(-2-n)*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] 1/4*((-I*a^n*n^2 + 2*I*a^n*n)*cos((d*x + c)*(n + 2)) + (-I*a^n*n^2 - 2*I*a^
n*n)*cos((d*x + c)*(n - 2)) + (-2*I*a^n*n^2 + 8*I*a^n)*cos((d*x + c)*n) + (
a^n*n^2 - 2*a^n*n)*sin((d*x + c)*(n + 2)) + (a^n*n^2 + 2*a^n*n)*sin((d*x +
c)*(n - 2)) + 2*(a^n*n^2 - 4*a^n)*sin((d*x + c)*n))/((e^(n + 2)*n^3 - 4*e^(
n + 2)*n)*d)
```

mupad [B] time = 9.30, size = 227, normalized size = 1.53

$$\frac{(\cos(2c+2dx)-\sin(2c+2dx)\,1\mathrm{i})\left(\frac{\left(a+\frac{a\sin(c+dx)\,1\mathrm{i}}{\cos(c+dx)}\right)^n (n+2)}{d\left(n^2\,1\mathrm{i}-4\mathrm{i}\right)}+\frac{(\cos(4c+4dx)+\sin(4c+4dx)\,1\mathrm{i})\left(a+\frac{a\sin(c+dx)\,1\mathrm{i}}{\cos(c+dx)}\right)^n (n-2)}{d\left(n^2\,1\mathrm{i}-4\mathrm{i}\right)}+\frac{(\cos(\cdots}{\cdots}\right.}{4\left(\frac{\cos(2c+2dx)}{2}+\frac{1}{2}\right)\left(\frac{e}{\cos(c+dx)}\right)^{n+2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^n/(e/cos(c + d*x))^(n + 2),x)
```

```
[Out] ((cos(2*c + 2*d*x) - sin(2*c + 2*d*x)*1i)*(((a + (a*sin(c + d*x)*1i)/cos(c
+ d*x))^n*(n + 2))/(d*(n^2*1i - 4i)) + ((cos(4*c + 4*d*x) + sin(4*c + 4*d*x
)*1i)*(a + (a*sin(c + d*x)*1i)/cos(c + d*x))^n*(n - 2))/(d*(n^2*1i - 4i)) +
 ((cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i)*(2*n^2 - 8)*(a + (a*sin(c + d*x)
*1i)/cos(c + d*x))^n)/(d*n*(n^2*1i - 4i))))/(4*(cos(2*c + 2*d*x)/2 + 1/2)*(
e/cos(c + d*x))^(n + 2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(c+dx))^{-n-2}\,(ia\,(\tan(c+dx)-i))^n\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(-2-n)*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Integral((e*sec(c + d*x))**(-n - 2)*(I*a*(tan(c + d*x) - I))**n, x)
```

3.486 $\int (e\sec(c+dx))^{-1-n}(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=94

$$\frac{i(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-n-1}}{d(1-n)}-\frac{i(a+ia\tan(c+dx))^{n+1}(e\sec(c+dx))^{-n-1}}{ad\left(1-n^2\right)}$$

```
[Out] I*(e*sec(d*x+c))^(-1-n)*(a+I*a*tan(d*x+c))^n/d/(1-n)-I*(e*sec(d*x+c))^(-1-n
)*(a+I*a*tan(d*x+c))^(1+n)/a/d/(-n^2+1)
```

Rubi [A] time = 0.12, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {3504, 3488}

$$\frac{i(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-n-1}}{d(1-n)}-\frac{i(a+ia\tan(c+dx))^{n+1}(e\sec(c+dx))^{-n-1}}{ad\left(1-n^2\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(-1 - n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] (I*(e*Sec[c + d*x])^(-1 - n)*(a + I*a*Tan[c + d*x])^n)/(d*(1 - n)) - (I*(e*
Sec[c + d*x])^(-1 - n)*(a + I*a*Tan[c + d*x])^(1 + n))/(a*d*(1 - n^2))
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3504

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m, n},
 x] && EqQ[a^2 + b^2, 0] && ILtQ[Simplify[m + n], 0] && NeQ[m + 2*n, 0]
```

Rubi steps

$$\begin{aligned}\int (e\sec(c+dx))^{-1-n}(a+ia\tan(c+dx))^n\,dx &= \frac{i(e\sec(c+dx))^{-1-n}(a+ia\tan(c+dx))^n}{d(1-n)}+\frac{\int (e\sec(c+dx))^{-1-}}{}\\ &= \frac{i(e\sec(c+dx))^{-1-n}(a+ia\tan(c+dx))^n}{d(1-n)}-\frac{i(e\sec(c+dx))^{-1-n}}{ad(}\end{aligned}$$

Mathematica [A] time = 0.20, size = 58, normalized size = 0.62

$$-\frac{i(n-i\tan(c+dx))(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-n-1}}{d(n-1)(n+1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(-1 - n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*(e*Sec[c + d*x])^(-1 - n)*(n - I*Tan[c + d*x])*(a + I*a*Tan[c + d*x])
^n)/(d*(-1 + n)*(1 + n))
```

fricas [A] time = 0.70, size = 129, normalized size = 1.37

$$\frac{\left((-in+i)e^{(2idx+2ic)}-in-i\right)\left(\frac{2ee^{(idx+ic)}}{e^{(2idx+2ic)}+1}\right)^{-n-1}e^{\left(idnx+icn+n\log\left(\frac{2ee^{(idx+ic)}}{e^{(2idx+2ic)}+1}\right)+n\log\left(\frac{a}{e}\right)\right)}}{dn^2+\left(dn^2-d\right)e^{(2idx+2ic)}-d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(-1-n)*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] ((-I*n + I)*e^(2*I*d*x + 2*I*c) - I*n - I)*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x
 + 2*I*c) + 1))^(-n - 1)*e^(I*d*n*x + I*c*n + n*log(2*e*e^(I*d*x + I*c)/(e^
(2*I*d*x + 2*I*c) + 1)) + n*log(a/e))/(d*n^2 + (d*n^2 - d)*e^(2*I*d*x + 2*I
*c) - d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{-n-1}(ia\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(-1-n)*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(-n - 1)*(I*a*tan(d*x + c) + a)^n, x)
```

maple [C] time = 1.86, size = 2490, normalized size = 26.49

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(-1-n)*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] 1/2/(I*d+I*n*d)*exp(I*(d*x+c))^n*a^n/e*e^(-n)*exp(1/2*I*(2*c+2*d*x+2*csgn(I
*exp(2*I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c)))*Pi*n-n*Pi*csgn(I*e/(exp(2*I*(d*
x+c))+1)*exp(I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))-n*Pi
*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2
-n*Pi*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2+
Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))*csgn(I*e)*csgn(I*exp(I*(d*
x+c))/(exp(2*I*(d*x+c))+1))+Pi*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d
*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))+csgn(I*a/(exp(2*I*(d*x+
c))+1)*exp(2*I*(d*x+c)))^2*csgn(I*a)*Pi*n+csgn(I*exp(2*I*(d*x+c)))*csgn(I*e
xp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*Pi*n-csgn(I*exp(2*I*(d*x+c)))*csgn(
I*exp(I*(d*x+c)))^2*Pi*n+csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*cs
gn(I/(exp(2*I*(d*x+c))+1))*Pi*n+csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1
))*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*Pi*n-n*Pi*csgn(I*e/(ex
p(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn(I*e)+n*Pi*csgn(I*e/(exp(2*I*(d*x+c
))+1)*exp(I*(d*x+c)))*csgn(I*e)*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))
+n*Pi*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x
+c))/(exp(2*I*(d*x+c))+1))-csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(2*I*(d*x+c))
/(exp(2*I*(d*x+c))+1))*csgn(I/(exp(2*I*(d*x+c))+1))*Pi*n-csgn(I*exp(2*I*(d*
x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))
*csgn(I*a)*Pi*n+n*Pi*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^3-Pi*csgn(
I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2-csgn(I*exp(
2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^3*Pi*n+n*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1
)*exp(I*(d*x+c)))^3-csgn(I*exp(2*I*(d*x+c)))^3*Pi*n+Pi*csgn(I*exp(I*(d*x+c)
)/(exp(2*I*(d*x+c))+1))^3+Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^
3-Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn(I*e)-Pi*csgn(I*e/
(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+
c))+1))-Pi*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x
```

```
+c))+1))^2-csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^3*Pi*n))+1/2/(-I
*d+I*n*d)*exp(I*(d*x+c))^n*a^n/e*e^(-n)*exp(-1/2*I*(2*c+2*d*x-2*csgn(I*exp(
2*I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c)))*Pi*n+n*Pi*csgn(I*e/(exp(2*I*(d*x+c))
+1)*exp(I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))+n*Pi*csgn
(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2+n*Pi
*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2-Pi*cs
gn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))*csgn(I*e)*csgn(I*exp(I*(d*x+c))
/(exp(2*I*(d*x+c))+1))-Pi*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x+c)
))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))-csgn(I*a/(exp(2*I*(d*x+c))+1
)*exp(2*I*(d*x+c)))^2*csgn(I*a)*Pi*n-csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(2*
I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*Pi*n+csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp
(I*(d*x+c)))^2*Pi*n-csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*csgn(I/
(exp(2*I*(d*x+c))+1))*Pi*n-csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*cs
gn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*Pi*n+n*Pi*csgn(I*e/(exp(2*I
*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn(I*e)-n*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)
*exp(I*(d*x+c)))*csgn(I*e)*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))-n*Pi
*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/
(exp(2*I*(d*x+c))+1))+csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(2*I*(d*x+c))/(exp
(2*I*(d*x+c))+1))*csgn(I/(exp(2*I*(d*x+c))+1))*Pi*n+csgn(I*exp(2*I*(d*x+c))
/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))*csgn
(I*a)*Pi*n-n*Pi*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^3+Pi*csgn(I*exp
(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2+csgn(I*exp(2*I*(
d*x+c))/(exp(2*I*(d*x+c))+1))^3*Pi*n-n*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp
(I*(d*x+c)))^3+csgn(I*exp(2*I*(d*x+c)))^3*Pi*n-Pi*csgn(I*exp(I*(d*x+c))/(ex
p(2*I*(d*x+c))+1))^3-Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^3+Pi*
csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn(I*e)+Pi*csgn(I*e/(exp(
2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1
))+Pi*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+
1))^2+csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^3*Pi*n))
```

maxima [A] time = 1.10, size = 113, normalized size = 1.20

$$\frac{(-i\,a^n n + i\,a^n)\cos\left((dx+c)(n+1)\right) + (-i\,a^n n - i\,a^n)\cos\left((dx+c)(n-1)\right) + (a^n n - a^n)\sin\left((dx+c)(n+1)\right) + (}{2\left(e^{n+1}n^2 - e^{n+1}\right)d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(-1-n)*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] 1/2*((-I*a^n*n + I*a^n)*cos((d*x + c)*(n + 1)) + (-I*a^n*n - I*a^n)*cos((d*
x + c)*(n - 1)) + (a^n*n - a^n)*sin((d*x + c)*(n + 1)) + (a^n*n + a^n)*sin(
(d*x + c)*(n - 1)))/((e^(n + 1)*n^2 - e^(n + 1))*d)
```

mupad [B] time = 1.89, size = 121, normalized size = 1.29

$$-\frac{\left(\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1i)}{\cos(2\,c+2\,d\,x)+1}\right)^n\,\left(\sin\left(c+d\,x\right)+\sin\left(3\,c+3\,d\,x\right)+n\,\cos\left(c+d\,x\right)\,3i+n\,\cos\left(3\,c+3\,d\,x\right)\,1i\right)}{2\,d\,e\,\left(\cos\left(2\,c+2\,d\,x\right)+1\right)\,\left(n^2-1\right)\,{\left(\frac{e}{\cos(c+d\,x)}\right)}^n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^n/(e/cos(c + d*x))^(n + 1),x)
```

```
[Out] -(((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1))
^n*(sin(c + d*x) + sin(3*c + 3*d*x) + n*cos(c + d*x)*3i + n*cos(3*c + 3*d*x
)*1i))/(2*d*e*(cos(2*c + 2*d*x) + 1)*(n^2 - 1)*(e/cos(c + d*x))^n)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(e\sec\left(c+dx\right)\right)^{-n-1}\left(ia\left(\tan\left(c+dx\right)-i\right)\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(-1-n)*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Integral((e*sec(c + d*x))**(-n - 1)*(I*a*(tan(c + d*x) - I))**n, x)
```

3.487 $\int (e\sec(c+dx))^{-n}(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=37

$$-\frac{i(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-n}}{dn}$$

```
[Out] -I*(a+I*a*tan(d*x+c))^n/d/n/((e*sec(d*x+c))^n)
```

Rubi [A] time = 0.05, antiderivative size = 37, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.036$, Rules used = {3488}

$$-\frac{i(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-n}}{dn}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^n/(e*Sec[c + d*x])^n,x]
```

```
[Out] ((-I)*(a + I*a*Tan[c + d*x])^n)/(d*n*(e*Sec[c + d*x])^n)
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rubi steps

$$\int (e\sec(c+dx))^{-n}(a+ia\tan(c+dx))^n\,dx=-\frac{i(e\sec(c+dx))^{-n}(a+ia\tan(c+dx))^n}{dn}$$

Mathematica [A] time = 0.04, size = 37, normalized size = 1.00

$$-\frac{i(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-n}}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^n/(e*Sec[c + d*x])^n,x]
```

```
[Out] ((-I)*(a + I*a*Tan[c + d*x])^n)/(d*n*(e*Sec[c + d*x])^n)
```

fricas [B] time = 0.66, size = 84, normalized size = 2.27

$$-\frac{ie^{\left(idnx+icn+n\log\left(\frac{2ee^{(idx+ic)}}{e^{(2idx+2ic)}+1}\right)+n\log\left(\frac{a}{e}\right)\right)}}{dn\left(\frac{2ee^{(idx+ic)}}{e^{(2idx+2ic)}+1}\right)^n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^n/((e*sec(d*x+c))^n),x, algorithm="fricas")
```

```
[Out] -I*e^(I*d*n*x + I*c*n + n*log(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1)
) + n*log(a/e))/(d*n*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(ia\tan(dx+c)+a)^n}{(e\sec(dx+c))^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^n/((e*sec(d*x+c))^n),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n/(e*sec(d*x + c))^n, x)
```

maple [C] time = 1.00, size = 874, normalized size = 23.62

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^n/((e*sec(d*x+c))^n),x)
```

```
[Out] -I/n/d*exp(1/2*n*(I*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))*csgn(I
*e)*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))-I*Pi*csgn(I*e/(exp(2*I*(d*x
+c))+1)*exp(I*(d*x+c)))^2*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))-I*Pi*
csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2-
I*Pi*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c))+1))^2-I
*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c))+1
)*exp(2*I*(d*x+c)))*csgn(I*a)*Pi+I*Pi*csgn(I*exp(I*(d*x+c))/(exp(2*I*(d*x+c
))+1))^3-I*csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c
))+1))*Pi*csgn(I/(exp(2*I*(d*x+c))+1))-I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(
d*x+c))+1))^3*Pi-I*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^3*Pi+I*P
i*csgn(I/(exp(2*I*(d*x+c))+1))*csgn(I*exp(I*(d*x+c)))*csgn(I*exp(I*(d*x+c))
/(exp(2*I*(d*x+c))+1))-I*csgn(I*exp(2*I*(d*x+c)))^3*Pi-I*csgn(I*exp(2*I*(d*
x+c)))*Pi*csgn(I*exp(I*(d*x+c)))^2+I*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I
*(d*x+c)))^3-I*Pi*csgn(I*e/(exp(2*I*(d*x+c))+1)*exp(I*(d*x+c)))^2*csgn(I*e)
+I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))*csgn(I*a/(exp(2*I*(d*x+c))
+1)*exp(2*I*(d*x+c)))^2*Pi+I*csgn(I*exp(2*I*(d*x+c))/(exp(2*I*(d*x+c))+1))^
2*Pi*csgn(I/(exp(2*I*(d*x+c))+1))+I*csgn(I*exp(2*I*(d*x+c)))*csgn(I*exp(2*I
*(d*x+c))/(exp(2*I*(d*x+c))+1))^2*Pi+2*I*csgn(I*exp(2*I*(d*x+c)))^2*Pi*csgn
(I*exp(I*(d*x+c)))+I*csgn(I*a/(exp(2*I*(d*x+c))+1)*exp(2*I*(d*x+c)))^2*csgn
(I*a)*Pi+2*ln(a)-2*ln(e)+2*ln(exp(I*(d*x+c)))))
```

maxima [B] time = 0.90, size = 86, normalized size = 2.32

$$-\frac{i a^n e^{\left(n\log\left(-\frac{2i\sin(dx+c)}{\cos(dx+c)+1}+\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-1\right)-n\log\left(-\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-1\right)\right)}}{de^n n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^n/((e*sec(d*x+c))^n),x, algorithm="maxima")
```

```
[Out] -I*a^n*e^(n*log(-2*I*sin(d*x + c)/(cos(d*x + c) + 1) + sin(d*x + c)^2/(cos(
d*x + c) + 1)^2 - 1) - n*log(-sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 1))/(d*
e^n*n)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{(a+a\tan(c+d\,x)\,1\mathrm{i})^n}{\left(\frac{e}{\cos(c+d\,x)}\right)^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^n/(e/cos(c + d*x))^n,x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^n/(e/cos(c + d*x))^n, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} x & \text{for}\ n = 0 \\ x \left(e \sec\left(c\right)\right)^{-n} \left(ia \tan\left(c\right) + a\right)^{n} & \text{for}\ d = 0 \\ \int \left(0^{\frac{1}{n}} \sec\left(c + dx\right)\right)^{-n} \left(ia \left(\tan\left(c + dx\right) - i\right)\right)^{n}\, dx & \text{for}\ e = 0^{\frac{1}{n}} \\ -\frac{ie^{-n} \left(ia \tan\left(c + dx\right) + a\right)^{n} \sec^{-n}\left(c + dx\right)}{dn} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**n/((e*sec(d*x+c))**n),x)
```

```
[Out] Piecewise((x, Eq(n, 0)), (x*(e*sec(c))**(-n)*(I*a*tan(c) + a)**n, Eq(d, 0))
, (Integral((0**(1/n)*sec(c + d*x))**(-n)*(I*a*(tan(c + d*x) - I))**n, x),
Eq(e, 0**(1/n))), (-I*e**(-n)*(I*a*tan(c + d*x) + a)**n*sec(c + d*x)**(-n)/
(d*n), True))
```

3.488 $\int (e\sec(c+dx))^{1-n}(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=118

$$\frac{i2^{\frac{n+1}{2}}(1+i\tan(c+dx))^{\frac{1}{2}(-n-1)}(a+ia\tan(c+dx))^n(e\sec(c+dx))^{1-n}\,{}_2F_1\left(\frac{1-n}{2},\frac{1-n}{2};\frac{3-n}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{d(1-n)}$$

```
[Out] I*2^(1/2+1/2*n)*hypergeom([1/2-1/2*n, 1/2-1/2*n],[3/2-1/2*n],1/2-1/2*I*tan(
d*x+c))*(e*sec(d*x+c))^(1-n)*(1+I*tan(d*x+c))^(-1/2-1/2*n)*(a+I*a*tan(d*x+c
))^n/d/(1-n)
```

Rubi [A] time = 0.22, antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {3505, 3523, 70, 69}

$$\frac{i2^{\frac{n+1}{2}}(1+i\tan(c+dx))^{\frac{1}{2}(-n-1)}(a+ia\tan(c+dx))^n(e\sec(c+dx))^{1-n}\text{Hypergeometric2F1}\left(\frac{1-n}{2},\frac{1-n}{2},\frac{3-n}{2},\frac{1}{2}(1-i\tan(c+dx))\right)}{d(1-n)}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(1 - n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] (I*2^((1 + n)/2)*Hypergeometric2F1[(1 - n)/2, (1 - n)/2, (3 - n)/2, (1 - I*
Tan[c + d*x])/2]*(e*Sec[c + d*x])^(1 - n)*(1 + I*Tan[c + d*x])^((-1 - n)/2)
*(a + I*a*Tan[c + d*x])^n)/(d*(1 - n))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^{1-n}(a+ia\tan(c+dx))^n\,dx = \Big((e\sec(c+dx))^{1-n}(a-ia\tan(c+dx))^{\frac{1}{2}(-1+n)}(a+ia\tan(c+dx)$$

$$= \frac{\Big(a^2(e\sec(c+dx))^{1-n}(a-ia\tan(c+dx))^{\frac{1}{2}(-1+n)}(a+ia\tan(c+d}{}$$

$$= \frac{\Big(2^{-\frac{1}{2}+\frac{n}{2}}a(e\sec(c+dx))^{1-n}(a-ia\tan(c+dx))^{\frac{1}{2}(-1+n)}(a+ia\tan(}{}$$

$$= \frac{i2^{\frac{1+n}{2}}\,{}_2F_1\left(\frac{1-n}{2},\frac{1-n}{2};\frac{3-n}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx))^{1-n}(}{d(1-n)}$$

Mathematica [A] time = 4.60, size = 87, normalized size = 0.74

$$-\frac{e(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-n}({}_2F_1(1,n;n+1;i\cos(c+dx)-\sin(c+dx))-{}_2F_1(1,n;n+1;\sin(c+}{dn}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(1 - n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] -((e*(Hypergeometric2F1[1, n, 1 + n, I*Cos[c + d*x] - Sin[c + d*x]] - Hyper
geometric2F1[1, n, 1 + n, (-I)*Cos[c + d*x] + Sin[c + d*x]])*(a + I*a*Tan[c
 + d*x])^n)/(d*n*(e*Sec[c + d*x])^n))
```

fricas [F] time = 0.61, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^{-n+1}e^{\left(i\,dnx+i\,cn+n\log\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)+n\log\left(\frac{a}{e}\right)\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1-n)*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral((2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^(-n + 1)*e^(I*d*n*
x + I*c*n + n*log(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1)) + n*log(a/
e)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{-n+1}(i\,a\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1-n)*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(-n + 1)*(I*a*tan(d*x + c) + a)^n, x)
```

maple [F] time = 2.08, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{-n+1}(a+ia\tan(dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(-n+1)*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int((e*sec(d*x+c))^(-n+1)*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1-n)*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(\frac{e}{\cos\left(c+d\,x\right)}\right)^{1-n}\,{\left(a+a\,\mathrm{tan}\left(c+d\,x\right)\,1\mathrm{i}\right)}^n \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(1 - n)*(a + a*tan(c + d*x)*1i)^n,x)
[Out] int((e/cos(c + d*x))^(1 - n)*(a + a*tan(c + d*x)*1i)^n, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(e \sec{\left(c + dx \right)}\right)^{1 - n} \left(ia \left(\tan{\left(c + dx \right)} - i\right)\right)^{n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(1-n)*(a+I*a*tan(d*x+c))**n,x)
[Out] Integral((e*sec(c + d*x))**(1 - n)*(I*a*(tan(c + d*x) - I))**n, x)
```

3.489 $\int (e\sec(c+dx))^{2-n}(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=113

$$\frac{ia2^{\frac{n}{2}+1}(1+i\tan(c+dx))^{-n/2}(a+ia\tan(c+dx))^{n-1}(e\sec(c+dx))^{2-n}\,{}_2F_1\left(\frac{2-n}{2},-\frac{n}{2};\frac{4-n}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{d(2-n)}$$

```
[Out] I*2^(1+1/2*n)*a*hypergeom([-1/2*n, 1-1/2*n],[2-1/2*n],1/2-1/2*I*tan(d*x+c))
*(e*sec(d*x+c))^(2-n)*(a+I*a*tan(d*x+c))^(-1+n)/d/(2-n)/((1+I*tan(d*x+c))^(
1/2*n))
```

Rubi [A] time = 0.18, antiderivative size = 113, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {3505, 3523, 70, 69}

$$\frac{ia2^{\frac{n}{2}+1}(1+i\tan(c+dx))^{-n/2}(a+ia\tan(c+dx))^{n-1}(e\sec(c+dx))^{2-n}\text{Hypergeometric2F1}\left(\frac{2-n}{2},-\frac{n}{2},\frac{4-n}{2},\frac{1}{2}(1-\right.}{d(2-n)}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(2 - n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] (I*2^(1 + n/2)*a*Hypergeometric2F1[(2 - n)/2, -n/2, (4 - n)/2, (1 - I*Tan[c
 + d*x])/2]*(e*Sec[c + d*x])^(2 - n)*(a + I*a*Tan[c + d*x])^(-1 + n))/(d*(2
 - n)*(1 + I*Tan[c + d*x])^(n/2))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^{2-n}(a+ia\tan(c+dx))^n\,dx = \Big((e\sec(c+dx))^{2-n}(a-ia\tan(c+dx))^{\frac{1}{2}(-2+n)}(a+ia\tan(c+dx))^{\frac{1}{2}(-$$

$$= \frac{\Big(a^2(e\sec(c+dx))^{2-n}(a-ia\tan(c+dx))^{\frac{1}{2}(-2+n)}(a+ia\tan(c+dx))}{}$$

$$= \frac{\Big(2^{n/2}a^2(e\sec(c+dx))^{2-n}(a-ia\tan(c+dx))^{\frac{1}{2}(-2+n)}(a+ia\tan(c+}{}$$

$$= \frac{i2^{1+\frac{n}{2}}a\,{}_2F_1\left(\frac{2-n}{2},-\frac{n}{2};\frac{4-n}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx))^{2-n}(1}{d(2-n)}$$

Mathematica [A] time = 13.62, size = 112, normalized size = 0.99

$$\frac{4e^2(\cos(2c)-i\sin(2c))(\tan(dx)+i)(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-n}\,{}_2F_1\left(2,1-\frac{n}{2};2-\frac{n}{2};i\sin(2(c+dx))-\mathrm{co}\right.}{d(n-2)(-1-i\tan(dx))}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(2 - n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] (4*e^2*Hypergeometric2F1[2, 1 - n/2, 2 - n/2, -Cos[2*(c + d*x)] + I*Sin[2*(
c + d*x)]]*(Cos[2*c] - I*Sin[2*c])*(I + Tan[d*x])*(a + I*a*Tan[c + d*x])^n)
/(d*(-2 + n)*(e*Sec[c + d*x])^n*(-1 - I*Tan[d*x]))
```

fricas [F] time = 0.57, size = 0, normalized size = 0.00

$$\frac{\left(\left(\frac{2ee^{(idx+ic)}}{e^{(2idx+2ic)}+1}\right)^{-n+2}\left(ie^{(2idx+2ic)}+i\right)e^{\left(idnx+icn+n\log\left(\frac{2ee^{(idx+ic)}}{e^{(2idx+2ic)}+1}\right)+n\log\left(\frac{a}{e}\right)\right)}+2de^{(2idx+2ic)}\mathrm{integral}\left(\frac{1}{2}\left(ne^{(2idx+2ic)}+n\right)\right.\right.}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(2-n)*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] 1/2*((2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^(-n + 2)*(I*e^(2*I*d*x
 + 2*I*c) + I)*e^(I*d*n*x + I*c*n + n*log(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x +
 2*I*c) + 1)) + n*log(a/e)) + 2*d*e^(2*I*d*x + 2*I*c)*integral(1/2*(n*e^(2*
I*d*x + 2*I*c) + n)*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^(-n + 2
)*e^(I*d*n*x + I*c*n - 2*I*d*x + n*log(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*
I*c) + 1)) + n*log(a/e) - 2*I*c), x))*e^(-2*I*d*x - 2*I*c)/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{-n+2}(ia\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(2-n)*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(-n + 2)*(I*a*tan(d*x + c) + a)^n, x)
```

maple [F] time = 2.05, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{2-n}(a+ia\tan(dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(2-n)*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int((e*sec(d*x+c))^(2-n)*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(2-n)*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(\frac{e}{\cos\left(c+d\,x\right)}\right)}^{2-n}\,{\left(a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^n \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(2 - n)*(a + a*tan(c + d*x)*1i)^n,x)
```

```
[Out] int((e/cos(c + d*x))^(2 - n)*(a + a*tan(c + d*x)*1i)^n, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(e \sec{\left(c + d x \right)}\right)^{2 - n} \left(i a \left(\tan{\left(c + d x \right)} - i\right)\right)^{n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(2-n)*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Integral((e*sec(c + d*x))**(2 - n)*(I*a*(tan(c + d*x) - I))**n, x)
```

3.490 $\int (e\sec(c+dx))^{3-n}(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=121

$$\frac{ia2^{\frac{n+3}{2}}(1+i\tan(c+dx))^{\frac{1}{2}(-n-1)}(a+ia\tan(c+dx))^{n-1}(e\sec(c+dx))^{3-n}\,{}_2F_1\left(\frac{1}{2}(-n-1),\frac{3-n}{2};\frac{5-n}{2};\frac{1}{2}(1-i\tan(c+d$$
$$d(3-n)$$

```
[Out] I*2^(3/2+1/2*n)*a*hypergeom([3/2-1/2*n, -1/2-1/2*n],[5/2-1/2*n],1/2-1/2*I*t
an(d*x+c))*(e*sec(d*x+c))^(3-n)*(1+I*tan(d*x+c))^(-1/2-1/2*n)*(a+I*a*tan(d*
x+c))^(-1+n)/d/(3-n)
```

Rubi [A] time = 0.24, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {3505, 3523, 70, 69}

$$\frac{ia2^{\frac{n+3}{2}}(1+i\tan(c+dx))^{\frac{1}{2}(-n-1)}(a+ia\tan(c+dx))^{n-1}(e\sec(c+dx))^{3-n}\text{Hypergeometric2F1}\left(\frac{1}{2}(-n-1),\frac{3-n}{2},\frac{5-n}{2}$$
$$d(3-n)$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(3 - n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] (I*2^((3 + n)/2)*a*Hypergeometric2F1[(-1 - n)/2, (3 - n)/2, (5 - n)/2, (1 -
 I*Tan[c + d*x])/2]*(e*Sec[c + d*x])^(3 - n)*(1 + I*Tan[c + d*x])^((-1 - n)
/2)*(a + I*a*Tan[c + d*x])^(-1 + n))/(d*(3 - n))
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^{3-n}(a+ia\tan(c+dx))^n\,dx = \Big((e\sec(c+dx))^{3-n}(a-ia\tan(c+dx))^{\frac{1}{2}(-3+n)}(a+ia\tan(c+dx)$$

$$= \frac{\Big(a^2(e\sec(c+dx))^{3-n}(a-ia\tan(c+dx))^{\frac{1}{2}(-3+n)}(a+ia\tan(c+d}{}$$

$$= \frac{\Big(2^{\frac{1}{2}+\frac{n}{2}}a^2(e\sec(c+dx))^{3-n}(a-ia\tan(c+dx))^{\frac{1}{2}(-3+n)}(a+ia\tan(}{}$$

$$= \frac{i2^{\frac{3+n}{2}}a\,{}_2F_1\left(\frac{1}{2}(-1-n),\frac{3-n}{2};\frac{5-n}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+}{d(3-n)}$$

Mathematica [A] time = 12.26, size = 116, normalized size = 0.96

$$\frac{8e^3(\tan(dx)+i)\sec(dx)(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-n}\,{}_2F_1\left(3,\frac{3-n}{2};\frac{5-n}{2};i\sin(2(c+dx))-\cos(2(c+dx)\right.}{d(n-3)(\cos(c)+i\sin(c))^3(\tan(dx)-i)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(3 - n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] (8*e^3*Hypergeometric2F1[3, (3 - n)/2, (5 - n)/2, -Cos[2*(c + d*x)] + I*Sin
[2*(c + d*x)]]*Sec[d*x]*(I + Tan[d*x])*(a + I*a*Tan[c + d*x])^n)/(d*(-3 + n
)*(e*Sec[c + d*x])^n*(Cos[c] + I*Sin[c])^3*(-I + Tan[d*x])^2)
```

fricas [F] time = 0.64, size = 0, normalized size = 0.00

$$\frac{\left(\left((-in-i)e^{(4idx+4ic)}-2ine^{(2idx+2ic)}-in+i\right)\left(\frac{2ee^{(idx+ic)}}{e^{(2idx+2ic)}+1}\right)^{-n+3}e^{\left(idnx+icn+n\log\left(\frac{2ee^{(idx+ic)}}{e^{(2idx+2ic)}+1}\right)+n\log\left(\frac{a}{e}\right)\right)}+8de^{(2idx+}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3-n)*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] 1/8*(((-I*n - I)*e^(4*I*d*x + 4*I*c) - 2*I*n*e^(2*I*d*x + 2*I*c) - I*n + I)
*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^(-n + 3)*e^(I*d*n*x + I*c*
n + n*log(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1)) + n*log(a/e)) + 8*
d*e^(2*I*d*x + 2*I*c)*integral(-1/8*(n^2 + (n^2 - 1)*e^(4*I*d*x + 4*I*c) +
2*(n^2 - 1)*e^(2*I*d*x + 2*I*c) - 1)*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I
*c) + 1))^(-n + 3)*e^(I*d*n*x + I*c*n - 2*I*d*x + n*log(2*e*e^(I*d*x + I*c)
/(e^(2*I*d*x + 2*I*c) + 1)) + n*log(a/e) - 2*I*c), x))*e^(-2*I*d*x - 2*I*c)
/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{-n+3}(ia\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3-n)*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(-n + 3)*(I*a*tan(d*x + c) + a)^n, x)
```

maple [F] time = 2.08, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{3-n}(a+ia\tan(dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(3-n)*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int((e*sec(d*x+c))^(3-n)*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3-n)*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(\frac{e}{\cos(c+d\,x)}\right)^{3-n} (a+a\tan(c+d\,x)\,1\mathrm{i})^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(3 - n)*(a + a*tan(c + d*x)*1i)^n,x)
```

```
[Out] int((e/cos(c + d*x))^(3 - n)*(a + a*tan(c + d*x)*1i)^n, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(c+dx))^{3-n}\,(ia(\tan(c+dx)-i))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(3-n)*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Integral((e*sec(c + d*x))**(3 - n)*(I*a*(tan(c + d*x) - I))**n, x)
```

3.491 $\int (e\sec(c+dx))^{6-2n}(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=156

$$\frac{8ia^3(a+ia\tan(c+dx))^{n-3}(e\sec(c+dx))^{6-2n}}{d(5-n)\left(n^2-7n+12\right)}+\frac{4ia^2(a+ia\tan(c+dx))^{n-2}(e\sec(c+dx))^{6-2n}}{d\left(n^2-9n+20\right)}+\frac{ia(a+ia\tan(c}{}$$

```
[Out] 8*I*a^3*(e*sec(d*x+c))^(6-2*n)*(a+I*a*tan(d*x+c))^(-3+n)/d/(-n^3+12*n^2-47*
n+60)+4*I*a^2*(e*sec(d*x+c))^(6-2*n)*(a+I*a*tan(d*x+c))^(-2+n)/d/(n^2-9*n+2
0)+I*a*(e*sec(d*x+c))^(6-2*n)*(a+I*a*tan(d*x+c))^(-1+n)/d/(5-n)
```

Rubi [A] time = 0.23, antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.067$, Rules used = {3494, 3493}

$$\frac{8ia^3(a+ia\tan(c+dx))^{n-3}(e\sec(c+dx))^{6-2n}}{d(5-n)\left(n^2-7n+12\right)}+\frac{4ia^2(a+ia\tan(c+dx))^{n-2}(e\sec(c+dx))^{6-2n}}{d\left(n^2-9n+20\right)}+\frac{ia(a+ia\tan(c}{}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(6 - 2*n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((8*I)*a^3*(e*Sec[c + d*x])^(6 - 2*n)*(a + I*a*Tan[c + d*x])^(-3 + n))/(d*(
5 - n)*(12 - 7*n + n^2)) + ((4*I)*a^2*(e*Sec[c + d*x])^(6 - 2*n)*(a + I*a*T
an[c + d*x])^(-2 + n))/(d*(20 - 9*n + n^2)) + (I*a*(e*Sec[c + d*x])^(6 - 2*
n)*(a + I*a*Tan[c + d*x])^(-1 + n))/(d*(5 - n))
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\int (e\sec(c+dx))^{6-2n}(a+ia\tan(c+dx))^n\,dx = \frac{ia(e\sec(c+dx))^{6-2n}(a+ia\tan(c+dx))^{-1+n}}{d(5-n)}+\frac{(4a)\int (e\sec(c}{}$$

$$= \frac{4ia^2(e\sec(c+dx))^{6-2n}(a+ia\tan(c+dx))^{-2+n}}{d\left(20-9n+n^2\right)}+\frac{ia(e\sec(c+}{}$$

$$= \frac{8ia^3(e\sec(c+dx))^{6-2n}(a+ia\tan(c+dx))^{-3+n}}{d(3-n)\left(20-9n+n^2\right)}+\frac{4ia^2(e\sec(c}{}$$

Mathematica [A] time = 2.19, size = 122, normalized size = 0.78

$$-\frac{e^6\sec^5(c+dx)(\sin(3(c+dx))+i\cos(3(c+dx)))(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-2n}\left(i\left(n^2-9n+18\right)\sin\right.}{d(n-5)(n-4)(n-3)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(6 - 2*n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] -((e^6*Sec[c + d*x]^5*(-2*(-5 + n) + (22 - 9*n + n^2)*Cos[2*(c + d*x)] + I*
(18 - 9*n + n^2)*Sin[2*(c + d*x)])*(I*Cos[3*(c + d*x)] + Sin[3*(c + d*x)])*
(a + I*a*Tan[c + d*x])^n)/(d*(-5 + n)*(-4 + n)*(-3 + n)*(e*Sec[c + d*x])^(2
*n)))
```

fricas [A] time = 0.58, size = 165, normalized size = 1.06

$$\frac{\left(\left(-i\,n^2+9i\,n-20i\right)e^{(6i\,dx+6i\,c)}+\left(-i\,n^2+11i\,n-30i\right)e^{(4i\,dx+4i\,c)}+(2i\,n-12i)e^{(2i\,dx+2i\,c)}-2i\right)\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^{-2\,n+6}e^{\left(i\right.}}{2\left(dn^3-12\,dn^2+47\,dn-60\,d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(6-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas"
)
```

```
[Out] 1/2*((-I*n^2 + 9*I*n - 20*I)*e^(6*I*d*x + 6*I*c) + (-I*n^2 + 11*I*n - 30*I)
*e^(4*I*d*x + 4*I*c) + (2*I*n - 12*I)*e^(2*I*d*x + 2*I*c) - 2*I)*(2*e*e^(I*
d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^(-2*n + 6)*e^(I*d*n*x + I*c*n - 6*I*d
*x + n*log(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1)) + n*log(a/e) - 6*
I*c)/(d*n^3 - 12*d*n^2 + 47*d*n - 60*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{-2\,n+6}\,(i\,a\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(6-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(-2*n + 6)*(I*a*tan(d*x + c) + a)^n, x)
```

maple [F] time = 2.23, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{6-2n}\,(a+ia\tan(dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(6-2*n)*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int((e*sec(d*x+c))^(6-2*n)*(a+I*a*tan(d*x+c))^n,x)
```

maxima [B] time = 3.28, size = 1062, normalized size = 6.81

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(6-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima"
)
```

```
[Out] -(64*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/
2*n)*a^n*e^6*cos(n*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 64*I*
(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/2*n)*
a^n*e^6*sin(n*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 32*(a^n*e^
6*n^2 - 9*a^n*e^6*n + 20*a^n*e^6)*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2
+ 2*cos(2*d*x + 2*c) + 1)^(1/2*n)*cos(4*d*x + n*arctan2(sin(2*d*x + 2*c), c
os(2*d*x + 2*c) + 1) + 4*c) - 64*(a^n*e^6*n - 5*a^n*e^6)*(cos(2*d*x + 2*c)^
```

```
2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/2*n)*cos(2*d*x + n*arct
an2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1) + 2*c) + (32*I*a^n*e^6*n^2 - 28
8*I*a^n*e^6*n + 640*I*a^n*e^6)*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2
*cos(2*d*x + 2*c) + 1)^(1/2*n)*sin(4*d*x + n*arctan2(sin(2*d*x + 2*c), cos(
2*d*x + 2*c) + 1) + 4*c) + (-64*I*a^n*e^6*n + 320*I*a^n*e^6)*(cos(2*d*x + 2
*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/2*n)*sin(2*d*x + n*
arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1) + 2*c))/(((-I*e^(2*n)*n^3 +
 12*I*e^(2*n)*n^2 - 47*I*e^(2*n)*n + 60*I*e^(2*n))*2^n*cos(10*d*x + 10*c) +
 (-5*I*e^(2*n)*n^3 + 60*I*e^(2*n)*n^2 - 235*I*e^(2*n)*n + 300*I*e^(2*n))*2^
n*cos(8*d*x + 8*c) + (-10*I*e^(2*n)*n^3 + 120*I*e^(2*n)*n^2 - 470*I*e^(2*n)
*n + 600*I*e^(2*n))*2^n*cos(6*d*x + 6*c) + (-10*I*e^(2*n)*n^3 + 120*I*e^(2*
n)*n^2 - 470*I*e^(2*n)*n + 600*I*e^(2*n))*2^n*cos(4*d*x + 4*c) + (-5*I*e^(2
*n)*n^3 + 60*I*e^(2*n)*n^2 - 235*I*e^(2*n)*n + 300*I*e^(2*n))*2^n*cos(2*d*x
 + 2*c) + (e^(2*n)*n^3 - 12*e^(2*n)*n^2 + 47*e^(2*n)*n - 60*e^(2*n))*2^n*si
n(10*d*x + 10*c) + 5*(e^(2*n)*n^3 - 12*e^(2*n)*n^2 + 47*e^(2*n)*n - 60*e^(2
*n))*2^n*sin(8*d*x + 8*c) + 10*(e^(2*n)*n^3 - 12*e^(2*n)*n^2 + 47*e^(2*n)*n
 - 60*e^(2*n))*2^n*sin(6*d*x + 6*c) + 10*(e^(2*n)*n^3 - 12*e^(2*n)*n^2 + 47
*e^(2*n)*n - 60*e^(2*n))*2^n*sin(4*d*x + 4*c) + 5*(e^(2*n)*n^3 - 12*e^(2*n)
*n^2 + 47*e^(2*n)*n - 60*e^(2*n))*2^n*sin(2*d*x + 2*c) + (-I*e^(2*n)*n^3 +
12*I*e^(2*n)*n^2 - 47*I*e^(2*n)*n + 60*I*e^(2*n))*2^n)*d)
```

mupad [B] time = 10.33, size = 318, normalized size = 2.04

$$(\cos(6c+6dx)-\sin(6c+6dx)\,1\mathrm{i})\left(\frac{e}{\cos(c+dx)}\right)^{6-2n}\left(\frac{\left(a+\frac{a\sin(c+dx)\,1\mathrm{i}}{\cos(c+dx)}\right)^n}{d\left(n^3\,1\mathrm{i}-n^2\,12\mathrm{i}+n\,47\mathrm{i}-60\mathrm{i}\right)}-\frac{(2n-12)\,(\cos$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(6 - 2*n)*(a + a*tan(c + d*x)*1i)^n,x)
```

```
[Out] (cos(6*c + 6*d*x) - sin(6*c + 6*d*x)*1i)*(e/cos(c + d*x))^(6 - 2*n)*((a + (
a*sin(c + d*x)*1i)/cos(c + d*x))^n/(d*(n*47i - n^2*12i + n^3*1i - 60i)) - (
(2*n - 12)*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i)*(a + (a*sin(c + d*x)*1i
)/cos(c + d*x))^n)/(2*d*(n*47i - n^2*12i + n^3*1i - 60i)) + ((cos(6*c + 6*d
*x) + sin(6*c + 6*d*x)*1i)*(a + (a*sin(c + d*x)*1i)/cos(c + d*x))^n*(n^2 -
9*n + 20))/(2*d*(n*47i - n^2*12i + n^3*1i - 60i)) + ((cos(4*c + 4*d*x) + si
n(4*c + 4*d*x)*1i)*(a + (a*sin(c + d*x)*1i)/cos(c + d*x))^n*(n^2 - 11*n + 3
0))/(2*d*(n*47i - n^2*12i + n^3*1i - 60i)))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(6-2*n)*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Timed out
```

3.492 $\int (e\sec(c+dx))^{5-2n}(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=97

$$-\frac{i2^{\frac{5}{2}-n}(1-i\tan(c+dx))^{n-\frac{5}{2}}(a+ia\tan(c+dx))^n(e\sec(c+dx))^{5-2n}\,{}_2F_1\left(\frac{5}{2},\frac{1}{2}(2n-3);\frac{7}{2};\frac{1}{2}(i\tan(c+dx)+1)\right)}{5d}$$

```
[Out] -1/5*I*2^(5/2-n)*hypergeom([5/2, -3/2+n],[7/2],1/2+1/2*I*tan(d*x+c))*(e*sec
(d*x+c))^(5-2*n)*(1-I*tan(d*x+c))^(-5/2+n)*(a+I*a*tan(d*x+c))^n/d
```

Rubi [A] time = 0.21, antiderivative size = 97, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {3505, 3523, 7, 70, 69}

$$-\frac{i2^{\frac{5}{2}-n}(1-i\tan(c+dx))^{n-\frac{5}{2}}(a+ia\tan(c+dx))^n(e\sec(c+dx))^{5-2n}\text{Hypergeometric2F1}\left(\frac{5}{2},\frac{1}{2}(2n-3),\frac{7}{2},\frac{1}{2}(1+i\right.}{5d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(5 - 2*n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I/5)*2^(5/2 - n)*Hypergeometric2F1[5/2, (-3 + 2*n)/2, 7/2, (1 + I*Tan[c
+ d*x])/2]*(e*Sec[c + d*x])^(5 - 2*n)*(1 - I*Tan[c + d*x])^(-5/2 + n)*(a +
I*a*Tan[c + d*x])^n)/d
```

Rule 7

```
Int[(u_.)*(Px_)^(p_), x_Symbol] :> Int[u*Px^Simplify[p], x] /; PolyQ[Px, x]
 &&  !RationalQ[p] && FreeQ[p, x] && RationalQ[Simplify[p]]
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
```

```
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^{5-2n}(a+ia\tan(c+dx))^n\,dx = \left((e\sec(c+dx))^{5-2n}(a-ia\tan(c+dx))^{\frac{1}{2}(-5+2n)}(a+ia\tan(c+a\right.$$

$$=\frac{\left(a^2(e\sec(c+dx))^{5-2n}(a-ia\tan(c+dx))^{\frac{1}{2}(-5+2n)}(a+ia\tan(c\right.}{}$$

$$=\frac{\left(a^2(e\sec(c+dx))^{5-2n}(a-ia\tan(c+dx))^{\frac{1}{2}(-5+2n)}(a+ia\tan(c\right.}{}$$

$$=\frac{\left(2^{\frac{3}{2}-n}a^3(e\sec(c+dx))^{5-2n}(a-ia\tan(c+dx))^{\frac{1}{2}-n+\frac{1}{2}(-5+2n)}\left(\frac{a-i}{}\right.\right.}{}$$

$$=-\frac{i2^{\frac{5}{2}-n}\,{}_2F_1\left(\frac{5}{2},\frac{1}{2}(-3+2n);\frac{7}{2};\frac{1}{2}(1+i\tan(c+dx))\right)(e\sec(c+d}{5d}$$

Mathematica [A] time = 13.80, size = 166, normalized size = 1.71

$$-\frac{i2^{5-n}e^{5i(c+dx)}\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{-n}\left(1+e^{2i(c+dx)}\right)^{-n}\,{}_2F_1\left(\frac{5}{2},5-n;\frac{7}{2};-e^{2i(c+dx)}\right)\sec^{n-5}(c+dx)(\cos(dx)+i\sin(a}{5d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(5 - 2*n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-1/5*I)*2^(5 - n)*E^((5*I)*(c + d*x))*(E^(I*d*x))^n*Hypergeometric2F1[5/2
, 5 - n, 7/2, -E^((2*I)*(c + d*x))]*Sec[c + d*x]^(-5 + n)*(e*Sec[c + d*x])^
(5 - 2*n)*(a + I*a*Tan[c + d*x])^n)/(d*(E^(I*(c + d*x))/(1 + E^((2*I)*(c +
d*x))))^n*(1 + E^((2*I)*(c + d*x)))^n*(Cos[d*x] + I*Sin[d*x])^n)
```

fricas [F] time = 0.80, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^{-2\,n+5}e^{\left(i\,dnx+i\,cn+n\log\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)+n\log\left(\frac{a}{e}\right)\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas"
)
```

```
[Out] integral((2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^(-2*n + 5)*e^(I*d*
n*x + I*c*n + n*log(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1)) + n*log(
a/e)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{-2\,n+5}(i\,a\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(-2*n + 5)*(I*a*tan(d*x + c) + a)^n, x)
```

maple [F] time = 2.12, size = 0, normalized size = 0.00

$$\int (e \sec (dx + c))^{5-2n} (a + ia \tan (dx + c))^{n} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(5-2*n)*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int((e*sec(d*x+c))^(5-2*n)*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e \sec (dx + c))^{-2n+5} (i a \tan (dx + c) + a)^{n} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(5-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima"
)
```

```
[Out] integrate((e*sec(d*x + c))^(-2*n + 5)*(I*a*tan(d*x + c) + a)^n, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(\frac{e}{\cos (c + d\,x)}\right)^{5-2\,n} (a + a \tan (c + d\,x)\, 1\mathrm{i})^{n} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(5 - 2*n)*(a + a*tan(c + d*x)*1i)^n,x)
```

```
[Out] int((e/cos(c + d*x))^(5 - 2*n)*(a + a*tan(c + d*x)*1i)^n, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(5-2*n)*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Timed out
```

3.493 $\int (e\sec(c+dx))^{4-2n}(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=98

$$\frac{2ia^2(a+ia\tan(c+dx))^{n-2}(e\sec(c+dx))^{4-2n}}{d\left(n^2-5n+6\right)}+\frac{ia(a+ia\tan(c+dx))^{n-1}(e\sec(c+dx))^{4-2n}}{d(3-n)}$$

```
[Out] 2*I*a^2*(e*sec(d*x+c))^(4-2*n)*(a+I*a*tan(d*x+c))^(-2+n)/d/(n^2-5*n+6)+I*a*
(e*sec(d*x+c))^(4-2*n)*(a+I*a*tan(d*x+c))^(-1+n)/d/(3-n)
```

Rubi [A] time = 0.13, antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {3494, 3493}

$$\frac{2ia^2(a+ia\tan(c+dx))^{n-2}(e\sec(c+dx))^{4-2n}}{d\left(n^2-5n+6\right)}+\frac{ia(a+ia\tan(c+dx))^{n-1}(e\sec(c+dx))^{4-2n}}{d(3-n)}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(4 - 2*n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((2*I)*a^2*(e*Sec[c + d*x])^(4 - 2*n)*(a + I*a*Tan[c + d*x])^(-2 + n))/(d*(
6 - 5*n + n^2)) + (I*a*(e*Sec[c + d*x])^(4 - 2*n)*(a + I*a*Tan[c + d*x])^(-
1 + n))/(d*(3 - n))
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\int (e\sec(c+dx))^{4-2n}(a+ia\tan(c+dx))^n\,dx=\frac{ia(e\sec(c+dx))^{4-2n}(a+ia\tan(c+dx))^{-1+n}}{d(3-n)}+\frac{(2a)\int (e\sec(c-}{}$$

$$=\frac{2ia^2(e\sec(c+dx))^{4-2n}(a+ia\tan(c+dx))^{-2+n}}{d\left(6-5n+n^2\right)}+\frac{ia(e\sec(c+d}{}$$

Mathematica [A] time = 1.24, size = 91, normalized size = 0.93

$$\frac{e^4\sec^2(c+dx)((n-2)\tan(c+dx)-i(n-4))(\cos(2(c+dx))-i\sin(2(c+dx)))(a+ia\tan(c+dx))^n(e\sec(c+}{d(n-3)(n-2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(4 - 2*n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] (e^4*Sec[c + d*x]^2*(Cos[2*(c + d*x)] - I*Sin[2*(c + d*x)])*(a + I*a*Tan[c
+ d*x])^n*((-I)*(-4 + n) + (-2 + n)*Tan[c + d*x]))/(d*(-3 + n)*(-2 + n)*(e*
Sec[c + d*x])^(2*n))
```

fricas [A] time = 0.68, size = 134, normalized size = 1.37

$$\frac{\left((-i\,n+3i)e^{(4i\,dx+4i\,c)}+(-i\,n+4i)e^{(2i\,dx+2i\,c)}+i\right)\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^{-2\,n+4}e^{\left(i\,dnx+i\,cn-4i\,dx+n\log\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)+n\log\left(\frac{a}{e}\right)-4i\,c\right)}}{2\left(dn^2-5\,dn+6\,d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(4-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas"
)
```

```
[Out] 1/2*((-I*n + 3*I)*e^(4*I*d*x + 4*I*c) + (-I*n + 4*I)*e^(2*I*d*x + 2*I*c) +
I)*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^(-2*n + 4)*e^(I*d*n*x +
I*c*n - 4*I*d*x + n*log(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1)) + n*
log(a/e) - 4*I*c)/(d*n^2 - 5*d*n + 6*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{-2\,n+4}\,(i\,a\tan(dx+c)+a)^{n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(4-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(-2*n + 4)*(I*a*tan(d*x + c) + a)^n, x)
```

maple [F] time = 2.04, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{4-2n}\,(a+ia\tan(dx+c))^{n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(4-2*n)*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int((e*sec(d*x+c))^(4-2*n)*(a+I*a*tan(d*x+c))^n,x)
```

maxima [B] time = 1.26, size = 594, normalized size = 6.06

$$\frac{8\left(\cos(2\,dx+2\,c)^2+\sin(2\,dx+2\,c)^2+2\,\cos(2\,dx+2\,c)+1\right)^{\frac{1}{2}\,n}a^n e^4\cos(n\arctan(\sin(2\,dx+2\,c),\cos(2\,dx+\ldots}{((\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(4-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima"
)
```

```
[Out] (8*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/2*
n)*a^n*e^4*cos(n*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) + 8*I*(co
s(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/2*n)*a^n
*e^4*sin(n*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)) - 8*(a^n*e^4*n
- 3*a^n*e^4)*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2*c)^2 + 2*cos(2*d*x + 2*c)
+ 1)^(1/2*n)*cos(2*d*x + n*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c) + 1)
+ 2*c) - (8*I*a^n*e^4*n - 24*I*a^n*e^4)*(cos(2*d*x + 2*c)^2 + sin(2*d*x + 2
*c)^2 + 2*cos(2*d*x + 2*c) + 1)^(1/2*n)*sin(2*d*x + n*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c) + 1) + 2*c))/(((-I*e^(2*n)*n^2 + 5*I*e^(2*n)*n - 6*I*
e^(2*n))*2^n*cos(6*d*x + 6*c) + (-3*I*e^(2*n)*n^2 + 15*I*e^(2*n)*n - 18*I*e
```

```
^(2*n))*2^n*cos(4*d*x + 4*c) + (-3*I*e^(2*n)*n^2 + 15*I*e^(2*n)*n - 18*I*e^
(2*n))*2^n*cos(2*d*x + 2*c) + (e^(2*n)*n^2 - 5*e^(2*n)*n + 6*e^(2*n))*2^n*s
in(6*d*x + 6*c) + 3*(e^(2*n)*n^2 - 5*e^(2*n)*n + 6*e^(2*n))*2^n*sin(4*d*x +
 4*c) + 3*(e^(2*n)*n^2 - 5*e^(2*n)*n + 6*e^(2*n))*2^n*sin(2*d*x + 2*c) + (-
I*e^(2*n)*n^2 + 5*I*e^(2*n)*n - 6*I*e^(2*n))*2^n)*d)
```

mupad [B] time = 5.93, size = 174, normalized size = 1.78

$$\frac{4\,e^4\left(\frac{a\,(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i})}{\cos(2\,c+2\,d\,x)+1}\right)^n\,\left(4\,\sin\left(2\,c+2\,d\,x\right)+\cos\left(2\,c+2\,d\,x\right)\,4\mathrm{i}+\cos\left(4\,c+4\,d\,x\right)\,1\mathrm{i}-n\,1\mathrm{i}+\sin\right.}{d\left(\frac{e}{\cos(c+d\,x)}\right)^{2\,n}\,\left(4\,\cos\left(2\,c+2\,d\,x\right)+\cos\left(4\,c+4\,d\,x\right)+3\right)\,\left(n\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(4 - 2*n)*(a + a*tan(c + d*x)*1i)^n,x)
```

```
[Out] (4*e^4*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x)
+ 1))^n*(cos(2*c + 2*d*x)*4i - n*1i + cos(4*c + 4*d*x)*1i + 4*sin(2*c + 2*d
*x) + sin(4*c + 4*d*x) - n*cos(2*c + 2*d*x)*1i - n*sin(2*c + 2*d*x) + 3i))/
(d*(e/cos(c + d*x))^(2*n)*(4*cos(2*c + 2*d*x) + cos(4*c + 4*d*x) + 3)*(n^2
- 5*n + 6))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(e \sec\left(c + dx\right)\right)^{4-2n} \left(ia\left(\tan\left(c + dx\right) - i\right)\right)^{n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(4-2*n)*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Integral((e*sec(c + d*x))**(4 - 2*n)*(I*a*(tan(c + d*x) - I))**n, x)
```

3.494 $\int (e \sec(c+dx))^{3-2n}(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=97

$$-\frac{i2^{\frac{3}{2}-n}(1-i\tan(c+dx))^{n-\frac{3}{2}}(a+ia\tan(c+dx))^n(e\sec(c+dx))^{3-2n}\,{}_2F_1\left(\frac{3}{2},\frac{1}{2}(2n-1);\frac{5}{2};\frac{1}{2}(i\tan(c+dx)+1)\right)}{3d}$$

```
[Out] -1/3*I*2^(3/2-n)*hypergeom([3/2, -1/2+n],[5/2],1/2+1/2*I*tan(d*x+c))*(e*sec
(d*x+c))^(3-2*n)*(1-I*tan(d*x+c))^(-3/2+n)*(a+I*a*tan(d*x+c))^n/d
```

Rubi [A] time = 0.21, antiderivative size = 97, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {3505, 3523, 7, 70, 69}

$$-\frac{i2^{\frac{3}{2}-n}(1-i\tan(c+dx))^{n-\frac{3}{2}}(a+ia\tan(c+dx))^n(e\sec(c+dx))^{3-2n}\text{Hypergeometric2F1}\left(\frac{3}{2},\frac{1}{2}(2n-1),\frac{5}{2},\frac{1}{2}(1+i\right.}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(3 - 2*n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I/3)*2^(3/2 - n)*Hypergeometric2F1[3/2, (-1 + 2*n)/2, 5/2, (1 + I*Tan[c
+ d*x])/2]*(e*Sec[c + d*x])^(3 - 2*n)*(1 - I*Tan[c + d*x])^(-3/2 + n)*(a +
I*a*Tan[c + d*x])^n)/d
```

Rule 7

```
Int[(u_.)*(Px_)^(p_), x_Symbol] :> Int[u*Px^Simplify[p], x] /; PolyQ[Px, x]
 && !RationalQ[p] && FreeQ[p, x] && RationalQ[Simplify[p]]
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] && !IntegerQ[m] && !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] || !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && !In
tegerQ[m] && !IntegerQ[n] && (RationalQ[m] || !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
```

```
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^{3-2n}(a+ia\tan(c+dx))^n\,dx = \Big((e\sec(c+dx))^{3-2n}(a-ia\tan(c+dx))^{\frac{1}{2}(-3+2n)}(a+ia\tan(c+
$$

$$= \frac{\Big(a^2(e\sec(c+dx))^{3-2n}(a-ia\tan(c+dx))^{\frac{1}{2}(-3+2n)}(a+ia\tan(c-}{}$$

$$= \frac{\Big(a^2(e\sec(c+dx))^{3-2n}(a-ia\tan(c+dx))^{\frac{1}{2}(-3+2n)}(a+ia\tan(c-}{}$$

$$= \frac{\Big(2^{\frac{1}{2}-n}a^2(e\sec(c+dx))^{3-2n}(a-ia\tan(c+dx))^{\frac{1}{2}-n+\frac{1}{2}(-3+2n)}\Big(\frac{a-i}{}}{}$$

$$= -\frac{i2^{\frac{3}{2}-n}\,{}_2F_1\left(\frac{3}{2},\frac{1}{2}(-1+2n);\frac{5}{2};\frac{1}{2}(1+i\tan(c+dx))\right)(e\sec(c+d}{3d}$$

Mathematica [A] time = 11.97, size = 166, normalized size = 1.71

$$-\frac{i2^{3-n}e^{3i(c+dx)}\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{-n}\left(1+e^{2i(c+dx)}\right)^{-n}{}_2F_1\left(\frac{3}{2},3-n;\frac{5}{2};-e^{2i(c+dx)}\right)\sec^{n-3}(c+dx)(\cos(dx)+i\sin(d}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(3 - 2*n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-1/3*I)*2^(3 - n)*E^((3*I)*(c + d*x))*(E^(I*d*x))^n*Hypergeometric2F1[3/2
, 3 - n, 5/2, -E^((2*I)*(c + d*x))]*Sec[c + d*x]^(-3 + n)*(e*Sec[c + d*x])^
(3 - 2*n)*(a + I*a*Tan[c + d*x])^n)/(d*(E^(I*(c + d*x))/(1 + E^((2*I)*(c +
d*x))))^n*(1 + E^((2*I)*(c + d*x)))^n*(Cos[d*x] + I*Sin[d*x])^n)
```

fricas [F] time = 0.76, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^{-2\,n+3}e^{\left(i\,dnx+i\,cn+n\log\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)+n\log\left(\frac{a}{e}\right)\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas"
)
```

```
[Out] integral((2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^(-2*n + 3)*e^(I*d*
n*x + I*c*n + n*log(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1)) + n*log(
a/e)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{-2\,n+3}(i\,a\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(-2*n + 3)*(I*a*tan(d*x + c) + a)^n, x)
```

maple [F] time = 2.00, size = 0, normalized size = 0.00

$$\int (e\sec (dx+c))^{3-2n} (a+ia\tan (dx+c))^{n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(3-2*n)*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int((e*sec(d*x+c))^(3-2*n)*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec (dx+c))^{-2\,n+3} (i\,a\tan (dx+c)+a)^{n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(3-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima"
)
```

```
[Out] integrate((e*sec(d*x + c))^(-2*n + 3)*(I*a*tan(d*x + c) + a)^n, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(\frac{e}{\cos \left(c+d\,x\right)}\right)}^{3-2\,n}\,{\left(a+a\,\tan \left(c+d\,x\right)\,1{}\mathrm{i}\right)}^n \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(3 - 2*n)*(a + a*tan(c + d*x)*1i)^n,x)
```

```
[Out] int((e/cos(c + d*x))^(3 - 2*n)*(a + a*tan(c + d*x)*1i)^n, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec (c+dx))^{3-2n} (ia (\tan (c+dx)-i))^{n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(3-2*n)*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Integral((e*sec(c + d*x))**(3 - 2*n)*(I*a*(tan(c + d*x) - I))**n, x)
```

3.495 $\int (e\sec(c+dx))^{2-2n}(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=46

$$\frac{ia(a+ia\tan(c+dx))^{n-1}(e\sec(c+dx))^{2-2n}}{d(1-n)}$$

```
[Out] I*a*(e*sec(d*x+c))^(2-2*n)*(a+I*a*tan(d*x+c))^(-1+n)/d/(1-n)
```

Rubi [A] time = 0.06, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.033, Rules used = {3493}

$$\frac{ia(a+ia\tan(c+dx))^{n-1}(e\sec(c+dx))^{2-2n}}{d(1-n)}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(2 - 2*n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] (I*a*(e*Sec[c + d*x])^(2 - 2*n)*(a + I*a*Tan[c + d*x])^(-1 + n))/(d*(1 - n)
)
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rubi steps

$$\int (e\sec(c+dx))^{2-2n}(a+ia\tan(c+dx))^n\,dx=\frac{ia(e\sec(c+dx))^{2-2n}(a+ia\tan(c+dx))^{-1+n}}{d(1-n)}$$

Mathematica [A] time = 0.65, size = 59, normalized size = 1.28

$$-\frac{e^2(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-2n}(\sec(c)\sin(dx)\sec(c+dx)+\tan(c)+i)}{d(n-1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(2 - 2*n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] -((e^2*(I + Sec[c]*Sec[c + d*x]*Sin[d*x] + Tan[c])*(a + I*a*Tan[c + d*x])^n
)/(d*(-1 + n)*(e*Sec[c + d*x])^(2*n)))
```

fricas [B] time = 0.67, size = 109, normalized size = 2.37

$$\frac{\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^{-2\,n+2}\left(-i\,e^{(2i\,dx+2i\,c)}-i\right)e^{\left(i\,dnx+i\,cn-2i\,dx+n\log\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)+n\log\left(\frac{a}{e}\right)-2i\,c\right)}}{2\,(dn-d)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(2-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas"
)
```

```
[Out] 1/2*(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^(-2*n + 2)*(-I*e^(2*I*d
*x + 2*I*c) - I)*e^(I*d*n*x + I*c*n - 2*I*d*x + n*log(2*e*e^(I*d*x + I*c)/(
e^(2*I*d*x + 2*I*c) + 1)) + n*log(a/e) - 2*I*c)/(d*n - d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e \sec(dx + c))^{-2n+2} (i a \tan(dx + c) + a)^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(2-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(-2*n + 2)*(I*a*tan(d*x + c) + a)^n, x)
```

maple [F] time = 2.08, size = 0, normalized size = 0.00

$$\int (e \sec(dx + c))^{2-2n} (a + ia \tan(dx + c))^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(2-2*n)*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int((e*sec(d*x+c))^(2-2*n)*(a+I*a*tan(d*x+c))^n,x)
```

maxima [B] time = 0.84, size = 217, normalized size = 4.72

$$\frac{\left(-i a^n e^2 - \frac{2 a^n e^2 \sin(dx+c)}{\cos(dx+c)+1} + \frac{i a^n e^2 \sin(dx+c)^2}{(\cos(dx+c)+1)^2}\right) e^{\left(n \log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right) + n \log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right) + n \log\left(-\frac{2i \sin(dx+c)}{\cos(dx+c)+1} + \frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2} - 1\right) - 2n \log\left(- \right.\right.}}{\left(e^{2n}(n-1) - \frac{e^{2n}(n-1)\sin(dx+c)^2}{(\cos(dx+c)+1)^2}\right) d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(2-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima"
)
```

```
[Out] (-I*a^n*e^2 - 2*a^n*e^2*sin(d*x + c)/(cos(d*x + c) + 1) + I*a^n*e^2*sin(d*x
 + c)^2/(cos(d*x + c) + 1)^2)*e^(n*log(sin(d*x + c)/(cos(d*x + c) + 1) + 1)
 + n*log(sin(d*x + c)/(cos(d*x + c) + 1) - 1) + n*log(-2*I*sin(d*x + c)/(co
s(d*x + c) + 1) + sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 1) - 2*n*log(-sin(d
*x + c)^2/(cos(d*x + c) + 1)^2 - 1))/((e^(2*n)*(n - 1) - e^(2*n)*(n - 1)*si
n(d*x + c)^2/(cos(d*x + c) + 1)^2)*d)
```

mupad [B] time = 4.24, size = 106, normalized size = 2.30

$$-\frac{e^2 \left(\cos(2c + 2dx)\, 1i + \sin(2c + 2dx) + 1i\right) \left(\frac{a\,(\cos(2c+2dx)+1+\sin(2c+2dx)\,1i)}{\cos(2c+2dx)+1}\right)^n}{d\,\left(\cos(2c + 2dx) + 1\right) \left(\frac{e}{\cos(c+dx)}\right)^{2n} (n - 1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(2 - 2*n)*(a + a*tan(c + d*x)*1i)^n,x)
```

```
[Out] -(e^2*(cos(2*c + 2*d*x)*1i + sin(2*c + 2*d*x) + 1i)*((a*(cos(2*c + 2*d*x) +
 sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1))^n)/(d*(cos(2*c + 2*d*x)
+ 1)*(e/cos(c + d*x))^(2*n)*(n - 1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e \sec(c + dx))^{2-2n} (ia (\tan(c + dx) - i))^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(2-2*n)*(a+I*a*tan(d*x+c))**n,x)
[Out] Integral((e*sec(c + d*x))**(2 - 2*n)*(I*a*(tan(c + d*x) - I))**n, x)
```

3.496 $\int (e\sec(c+dx))^{1-2n}(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=95

$$-\frac{i2^{\frac{1}{2}-n}(1-i\tan(c+dx))^{n-\frac{1}{2}}(a+ia\tan(c+dx))^n(e\sec(c+dx))^{1-2n}\,{}_2F_1\left(\frac{1}{2},\frac{1}{2}(2n+1);\frac{3}{2};\frac{1}{2}(i\tan(c+dx)+1)\right)}{d}$$

```
[Out] -I*2^(1/2-n)*hypergeom([1/2, 1/2+n],[3/2],1/2+1/2*I*tan(d*x+c))*(e*sec(d*x+
c))^(1-2*n)*(1-I*tan(d*x+c))^(-1/2+n)*(a+I*a*tan(d*x+c))^n/d
```

Rubi [A] time = 0.18, antiderivative size = 95, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {3505, 3523, 7, 70, 69}

$$-\frac{i2^{\frac{1}{2}-n}(1-i\tan(c+dx))^{n-\frac{1}{2}}(a+ia\tan(c+dx))^n(e\sec(c+dx))^{1-2n}\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{1}{2}(2n+1),\frac{3}{2},\frac{1}{2}(1+i\right.}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(1 - 2*n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(1/2 - n)*Hypergeometric2F1[1/2, (1 + 2*n)/2, 3/2, (1 + I*Tan[c + d
*x])/2]*(e*Sec[c + d*x])^(1 - 2*n)*(1 - I*Tan[c + d*x])^(-1/2 + n)*(a + I*a
*Tan[c + d*x])^n)/d
```

Rule 7

```
Int[(u_.)*(Px_)^(p_), x_Symbol] :> Int[u*Px^Simplify[p], x] /; PolyQ[Px, x]
 &&  !RationalQ[p] && FreeQ[p, x] && RationalQ[Simplify[p]]
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
```

```
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^{1-2n}(a+ia\tan(c+dx))^n\,dx = \left((e\sec(c+dx))^{1-2n}(a-ia\tan(c+dx))^{\frac{1}{2}(-1+2n)}(a+ia\tan(c+
$$

$$= \frac{\left(a^2(e\sec(c+dx))^{1-2n}(a-ia\tan(c+dx))^{\frac{1}{2}(-1+2n)}(a+ia\tan(c+\right.}{}$$

$$= \frac{\left(a^2(e\sec(c+dx))^{1-2n}(a-ia\tan(c+dx))^{\frac{1}{2}(-1+2n)}(a+ia\tan(c+\right.}{d}$$

$$= \frac{\left(2^{-\frac{1}{2}-n}a(e\sec(c+dx))^{1-2n}(a-ia\tan(c+dx))^{\frac{1}{2}-n+\frac{1}{2}(-1+2n)}\left(\frac{a-i}{}\right.\right.}{}$$

$$= -\frac{i2^{\frac{1}{2}-n}\,{}_2F_1\left(\frac{1}{2},\frac{1}{2}(1+2n);\frac{3}{2};\frac{1}{2}(1+i\tan(c+dx))\right)(e\sec(c+dx)}{d}$$

Mathematica [A] time = 8.22, size = 154, normalized size = 1.62

$$-\frac{ie2^{1-n}\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{1-n}\left(1+e^{2i(c+dx)}\right)^{1-n}{}_2F_1\left(\frac{1}{2},1-n;\frac{3}{2};-e^{2i(c+dx)}\right)\sec^n(c+dx)(\cos(dx)+i\sin(dx))^{-n}(}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(1 - 2*n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(1 - n)*e*(E^(I*d*x))^n*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x))))
^(1 - n)*(1 + E^((2*I)*(c + d*x)))^(1 - n)*Hypergeometric2F1[1/2, 1 - n, 3/
2, -E^((2*I)*(c + d*x))]*Sec[c + d*x]^n*(a + I*a*Tan[c + d*x])^n)/(d*(e*Sec
[c + d*x])^(2*n)*(Cos[d*x] + I*Sin[d*x])^n)
```

fricas [F] time = 0.61, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^{-2\,n+1}e^{\left(i\,dnx+i\,cn+n\log\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)+n\log\left(\frac{a}{e}\right)\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas"
)
```

```
[Out] integral((2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^(-2*n + 1)*e^(I*d*
n*x + I*c*n + n*log(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1)) + n*log(
a/e)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{-2\,n+1}(i\,a\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(-2*n + 1)*(I*a*tan(d*x + c) + a)^n, x)
```

maple [F] time = 1.96, size = 0, normalized size = 0.00

$$\int \left(e \sec \left(dx + c\right)\right)^{1-2n} \left(a + ia \tan \left(dx + c\right)\right)^{n} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(1-2*n)*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int((e*sec(d*x+c))^(1-2*n)*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(e \sec \left(dx + c\right)\right)^{-2\,n+1} \left(i\,a \tan \left(dx + c\right) + a\right)^{n} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(1-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima"
)
```

```
[Out] integrate((e*sec(d*x + c))^(-2*n + 1)*(I*a*tan(d*x + c) + a)^n, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(\frac{e}{\cos \left(c + d\,x\right)}\right)^{1-2\,n} \left(a + a \tan \left(c + d\,x\right)\,1\mathrm{i}\right)^{n} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e/cos(c + d*x))^(1 - 2*n)*(a + a*tan(c + d*x)*1i)^n,x)
```

```
[Out] int((e/cos(c + d*x))^(1 - 2*n)*(a + a*tan(c + d*x)*1i)^n, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(e \sec \left(c + dx\right)\right)^{1-2n} \left(ia \left(\tan \left(c + dx\right) - i\right)\right)^{n} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(1-2*n)*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Integral((e*sec(c + d*x))**(1 - 2*n)*(I*a*(tan(c + d*x) - I))**n, x)
```

3.497 $\int (e\sec(c+dx))^{-2n}(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=65

$$-\frac{i(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-2n}\,{}_2F_1\left(1,-n;1-n;\frac{1}{2}(1-i\tan(c+dx))\right)}{2dn}$$

```
[Out] -1/2*I*hypergeom([1, -n],[1-n],1/2-1/2*I*tan(d*x+c))*(a+I*a*tan(d*x+c))^n/d
/n/((e*sec(d*x+c))^(2*n))
```

Rubi [A] time = 0.08, antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.107, Rules used = {3492, 3481, 68}

$$-\frac{i(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-2n}\text{Hypergeometric2F1}\left(1,-n,1-n,\frac{1}{2}(1-i\tan(c+dx))\right)}{2dn}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])^n/(e*Sec[c + d*x])^(2*n),x]
```

```
[Out] ((-I/2)*Hypergeometric2F1[1, -n, 1 - n, (1 - I*Tan[c + d*x])/2]*(a + I*a*Ta
n[c + d*x])^n)/(d*n*(e*Sec[c + d*x])^(2*n))
```

Rule 68

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a
+ b*x))/(b*c - a*d))])/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]
 && NeQ[b*c - a*d, 0] &&  !IntegerQ[m] && IntegerQ[n]
```

Rule 3481

```
Int[((a_) + (b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> -Dist[b/d, Su
bst[Int[(a + x)^(n - 1)/(a - x), x], x, b*Tan[c + d*x]], x] /; FreeQ[{a, b,
 c, d, n}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3492

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Dist[((a/d)^(2*IntPart[n])*(a + b*Tan[e + f*x])^Fra
cPart[n]*(a - b*Tan[e + f*x])^FracPart[n])/(d*Sec[e + f*x])^(2*FracPart[n])
, Int[1/(a - b*Tan[e + f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] &
& EqQ[a^2 + b^2, 0] && EqQ[Simplify[m/2 + n], 0]
```

Rubi steps

$$\int (e\sec(c+dx))^{-2n}(a+ia\tan(c+dx))^n\,dx = \left((e\sec(c+dx))^{-2n}(a-ia\tan(c+dx))^n(a+ia\tan(c+dx))^n\right)\int$$

$$= \frac{\left(ia(e\sec(c+dx))^{-2n}(a-ia\tan(c+dx))^n(a+ia\tan(c+dx))^n\right)}{d}$$

$$= -\frac{i\,{}_2F_1\left(1,-n;1-n;\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx))^{-2n}(a+}{2dn}$$

Mathematica [B] time = 1.78, size = 146, normalized size = 2.25

$$\frac{i2^{-n-1}\left(1+e^{2i(c+dx)}\right)\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{-n}{}_2F_1\left(1,n+1;n+2;1+e^{2i(c+dx)}\right)\sec^n(c+dx)(\cos(dx)+i\sin(dx))^{-n}(a+}{d(n+1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])^n/(e*Sec[c + d*x])^(2*n),x]
```

```
[Out] (I*2^(-1 - n)*(E^(I*d*x))^n*(1 + E^((2*I)*(c + d*x)))*Hypergeometric2F1[1,
1 + n, 2 + n, 1 + E^((2*I)*(c + d*x))]*Sec[c + d*x]^n*(a + I*a*Tan[c + d*x]
)^n)/(d*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x))))^n*(1 + n)*(e*Sec[c + d*
x])^(2*n)*(Cos[d*x] + I*Sin[d*x])^n)
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{e^{\left(idnx+icn+n\log\left(\frac{2ee^{(idx+ic)}}{e^{(2idx+2ic)}+1}\right)+n\log\left(\frac{a}{e}\right)\right)}}{\left(\frac{2ee^{(idx+ic)}}{e^{(2idx+2ic)}+1}\right)^{2n}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^n/((e*sec(d*x+c))^(2*n)),x, algorithm="fricas"
)
```

```
[Out] integral(e^(I*d*n*x + I*c*n + n*log(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c
) + 1)) + n*log(a/e))/(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^(2*n)
, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{(i\,a\tan(dx+c)+a)^n}{(e\sec(dx+c))^{2\,n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^n/((e*sec(d*x+c))^(2*n)),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n/(e*sec(d*x + c))^(2*n), x)
```

maple [F] time = 1.36, size = 0, normalized size = 0.00

$$\int(a+ia\tan(dx+c))^n\,(e\sec(dx+c))^{-2n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^n/((e*sec(d*x+c))^(2*n)),x)
```

```
[Out] int((a+I*a*tan(d*x+c))^n/((e*sec(d*x+c))^(2*n)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{(i\,a\tan(dx+c)+a)^n}{(e\sec(dx+c))^{2\,n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^n/((e*sec(d*x+c))^(2*n)),x, algorithm="maxima"
)
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^n/(e*sec(d*x + c))^(2*n), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{(a + a\tan(c + d\,x)\,1\mathrm{i})^n}{\left(\frac{e}{\cos(c+d\,x)}\right)^{2\,n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^n/(e/cos(c + d*x))^(2*n),x)
[Out] int((a + a*tan(c + d*x)*1i)^n/(e/cos(c + d*x))^(2*n), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(c + dx))^{-2n}\,(ia\,(\tan(c + dx) - i))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**n/((e*sec(d*x+c))**(2*n)),x)
[Out] Integral((e*sec(c + d*x))**(-2*n)*(I*a*(tan(c + d*x) - I))**n, x)
```

3.498 $\int (e\sec(c+dx))^{-1-2n}(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=95

$$\frac{i2^{-n-\frac{1}{2}}(1-i\tan(c+dx))^{n+\frac{1}{2}}(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-2n-1}\,{}_2F_1\left(-\frac{1}{2},\frac{1}{2}(2n+3);\frac{1}{2};\frac{1}{2}(i\tan(c+dx)+1)\right)}{d}$$

```
[Out] I*2^(-1/2-n)*hypergeom([-1/2, 3/2+n],[1/2],1/2+1/2*I*tan(d*x+c))*(e*sec(d*x
+c))^(-1-2*n)*(1-I*tan(d*x+c))^(1/2+n)*(a+I*a*tan(d*x+c))^n/d
```

Rubi [A] time = 0.19, antiderivative size = 95, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {3505, 3523, 7, 70, 69}

$$\frac{i2^{-n-\frac{1}{2}}(1-i\tan(c+dx))^{n+\frac{1}{2}}(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-2n-1}\text{Hypergeometric2F1}\left(-\frac{1}{2},\frac{1}{2}(2n+3),\frac{1}{2},\frac{1}{2}(1\right.}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(-1 - 2*n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] (I*2^(-1/2 - n)*Hypergeometric2F1[-1/2, (3 + 2*n)/2, 1/2, (1 + I*Tan[c + d*
x])/2]*(e*Sec[c + d*x])^(-1 - 2*n)*(1 - I*Tan[c + d*x])^(1/2 + n)*(a + I*a*
Tan[c + d*x])^n)/d
```

Rule 7

```
Int[(u_.)*(Px_)^(p_), x_Symbol] :> Int[u*Px^Simplify[p], x] /; PolyQ[Px, x]
 && !RationalQ[p] && FreeQ[p, x] && RationalQ[Simplify[p]]
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
```

```
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^{-1-2n}(a+ia\tan(c+dx))^n\,dx = \left((e\sec(c+dx))^{-1-2n}(a-ia\tan(c+dx))^{\frac{1}{2}(1+2n)}(a+ia\tan(c+\right.$$

$$= \frac{\left(a^2(e\sec(c+dx))^{-1-2n}(a-ia\tan(c+dx))^{\frac{1}{2}(1+2n)}(a+ia\tan(\right.}{}$$

$$= \frac{\left(a^2(e\sec(c+dx))^{-1-2n}(a-ia\tan(c+dx))^{\frac{1}{2}(1+2n)}(a+ia\tan(c\right.}{d}$$

$$= \frac{\left(2^{-\frac{3}{2}-n}a(e\sec(c+dx))^{-1-2n}(a-ia\tan(c+dx))^{-\frac{1}{2}-n+\frac{1}{2}(1+2n)}\right(}{}$$

$$= \frac{i2^{-\frac{1}{2}-n}\,{}_2F_1\left(-\frac{1}{2},\frac{1}{2}(3+2n);\frac{1}{2};\frac{1}{2}(1+i\tan(c+dx))\right)(e\sec(c+}{d}$$

Mathematica [A] time = 12.88, size = 157, normalized size = 1.65

$$\frac{i2^{-n-1}\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{-n-1}\left(1+e^{2i(c+dx)}\right)^{-n-1}{}_2F_1\left(-\frac{1}{2},-n-1;\frac{1}{2};-e^{2i(c+dx)}\right)\sec^{n+1}(c+dx)(\cos(dx)+i\sin(d}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(-1 - 2*n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] (I*2^(-1 - n)*(E^(I*d*x))^n*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x))))^(-1
 - n)*(1 + E^((2*I)*(c + d*x)))^(-1 - n)*Hypergeometric2F1[-1/2, -1 - n, 1/
2, -E^((2*I)*(c + d*x))]*Sec[c + d*x]^(1 + n)*(e*Sec[c + d*x])^(-1 - 2*n)*(
a + I*a*Tan[c + d*x])^n)/(d*(Cos[d*x] + I*Sin[d*x])^n)
```

fricas [F] time = 0.59, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^{-2\,n-1}e^{\left(i\,dnx+i\,cn+n\log\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)+n\log\left(\frac{a}{e}\right)\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(-1-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas
")
```

```
[Out] integral((2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^(-2*n - 1)*e^(I*d*
n*x + I*c*n + n*log(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1)) + n*log(
a/e)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int(e\sec(dx+c))^{-2\,n-1}(i\,a\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(-1-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(-2*n - 1)*(I*a*tan(d*x + c) + a)^n, x)
```

maple [F] time = 2.84, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{-1-2n} (a+ia\tan(dx+c))^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(-1-2*n)*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int((e*sec(d*x+c))^(-1-2*n)*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{-2n-1} (ia\tan(dx+c)+a)^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(-1-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima
")
```

```
[Out] integrate((e*sec(d*x + c))^(-2*n - 1)*(I*a*tan(d*x + c) + a)^n, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+a\tan(c+dx)\,1\mathrm{i})^n}{\left(\frac{e}{\cos(c+dx)}\right)^{2n+1}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^n/(e/cos(c + d*x))^(2*n + 1),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^n/(e/cos(c + d*x))^(2*n + 1), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(c+dx))^{-2n-1} (ia(\tan(c+dx)-i))^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(-1-2*n)*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Integral((e*sec(c + d*x))**(-2*n - 1)*(I*a*(tan(c + d*x) - I))**n, x)
```

3.499 $\int (e\sec(c+dx))^{-2-2n}(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=74

$$-\frac{i(a+ia\tan(c+dx))^{n+1}(e\sec(c+dx))^{-2(n+1)}\,{}_2F_1\left(2,-n-1;-n;\frac{1}{2}(1-i\tan(c+dx))\right)}{4ad(n+1)}$$

```
[Out] -1/4*I*hypergeom([2, -1-n],[-n],1/2-1/2*I*tan(d*x+c))*(a+I*a*tan(d*x+c))^(1
+n)/a/d/(1+n)/((e*sec(d*x+c))^(2+2*n))
```

Rubi [A] time = 0.15, antiderivative size = 74, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {3505, 3523, 7, 68}

$$-\frac{i(a+ia\tan(c+dx))^{n+1}(e\sec(c+dx))^{-2(n+1)}\text{Hypergeometric2F1}\left(2,-n-1,-n,\frac{1}{2}(1-i\tan(c+dx))\right)}{4ad(n+1)}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(-2 - 2*n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I/4)*Hypergeometric2F1[2, -1 - n, -n, (1 - I*Tan[c + d*x])/2]*(a + I*a*T
an[c + d*x])^(1 + n))/(a*d*(1 + n)*(e*Sec[c + d*x])^(2*(1 + n)))
```

Rule 7

```
Int[(u_.)*(Px_)^(p_), x_Symbol] :> Int[u*Px^Simplify[p], x] /; PolyQ[Px, x]
 && !RationalQ[p] && FreeQ[p, x] && RationalQ[Simplify[p]]
```

Rule 68

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a
+ b*x))/(b*c - a*d))])/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]
 && NeQ[b*c - a*d, 0] && !IntegerQ[m] && IntegerQ[n]
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^{-2-2n}(a+ia\tan(c+dx))^n\,dx = \Big((e\sec(c+dx))^{-2-2n}(a-ia\tan(c+dx))^{\frac{1}{2}(2+2n)}(a+ia\tan(c+dx$$

$$= \frac{\Big(a^2(e\sec(c+dx))^{-2-2n}(a-ia\tan(c+dx))^{\frac{1}{2}(2+2n)}(a+ia\tan(c+}{}$$

$$= \frac{\Big(a^2(e\sec(c+dx))^{-2-2n}(a-ia\tan(c+dx))^{\frac{1}{2}(2+2n)}(a+ia\tan(c+}{d}$$

$$= -\frac{i\,{}_2F_1\left(2,-1-n;-n;\frac{1}{2}(1-i\tan(c+dx))\right)(e\sec(c+dx))^{-2(1+n)}(}{4ad(1+n)}$$

Mathematica [B] time = 13.12, size = 151, normalized size = 2.04

$$-\frac{i2^{-n-3}\left(1+e^{2i(c+dx)}\right)^3\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{-n}{}_2F_1\left(2,n+3;n+4;1+e^{2i(c+dx)}\right)\sec^n(c+dx)(\cos(dx)+i\sin(dx))^{-n}(}{de^2(n+3)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(-2 - 2*n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(-3 - n)*(E^(I*d*x))^n*(1 + E^((2*I)*(c + d*x)))^3*Hypergeometric2F
1[2, 3 + n, 4 + n, 1 + E^((2*I)*(c + d*x))]*Sec[c + d*x]^n*(a + I*a*Tan[c +
 d*x])^n)/(d*e^2*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x))))^n*(3 + n)*(e*S
ec[c + d*x])^(2*n)*(Cos[d*x] + I*Sin[d*x])^n)
```

fricas [F] time = 0.68, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^{-2\,n-2}e^{\left(i\,dnx+i\,cn+n\log\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)+n\log\left(\frac{a}{e}\right)\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(-2-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas
")
```

```
[Out] integral((2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^(-2*n - 2)*e^(I*d*
n*x + I*c*n + n*log(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1)) + n*log(
a/e)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{-2\,n-2}(i\,a\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(-2-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(-2*n - 2)*(I*a*tan(d*x + c) + a)^n, x)
```

maple [F] time = 2.67, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{-2-2n}(a+ia\tan(dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(-2-2*n)*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int((e*sec(d*x+c))^(-2-2*n)*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e \sec (dx + c))^{-2\,n-2} \,(i\,a \tan (dx + c) + a)^{n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(-2-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima
")
```

```
[Out] integrate((e*sec(d*x + c))^(-2*n - 2)*(I*a*tan(d*x + c) + a)^n, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a + a \tan (c + d\,x)\, 1\mathrm{i})^{n}}{\left(\frac{e}{\cos(c+d\,x)}\right)^{2\,n+2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^n/(e/cos(c + d*x))^(2*n + 2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^n/(e/cos(c + d*x))^(2*n + 2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e \sec (c + dx))^{-2n-2} \,(ia\,(\tan (c + dx) - i))^{n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(-2-2*n)*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Integral((e*sec(c + d*x))**(-2*n - 2)*(I*a*(tan(c + d*x) - I))**n, x)
```

3.500 $\int (e\sec(c+dx))^{-3-2n}(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=97

$$\frac{i2^{-n-\frac{3}{2}}(1-i\tan(c+dx))^{n+\frac{3}{2}}(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-2n-3}\,{}_2F_1\left(-\frac{3}{2},\frac{1}{2}(2n+5);-\frac{1}{2};\frac{1}{2}(i\tan(c+dx)+1)\right)}{3d}$$

```
[Out] 1/3*I*2^(-3/2-n)*hypergeom([-3/2, 5/2+n],[-1/2],1/2+1/2*I*tan(d*x+c))*(e*se
c(d*x+c))^(-3-2*n)*(1-I*tan(d*x+c))^(3/2+n)*(a+I*a*tan(d*x+c))^n/d
```

Rubi [A] time = 0.21, antiderivative size = 97, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.167$, Rules used = $\{3505, 3523, 7, 70, 69\}$

$$\frac{i2^{-n-\frac{3}{2}}(1-i\tan(c+dx))^{n+\frac{3}{2}}(a+ia\tan(c+dx))^n(e\sec(c+dx))^{-2n-3}\text{Hypergeometric2F1}\left(-\frac{3}{2},\frac{1}{2}(2n+5),-\frac{1}{2},\frac{1}{2}(\right.}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Sec[c + d*x])^(-3 - 2*n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((I/3)*2^(-3/2 - n)*Hypergeometric2F1[-3/2, (5 + 2*n)/2, -1/2, (1 + I*Tan[c
 + d*x])/2]*(e*Sec[c + d*x])^(-3 - 2*n)*(1 - I*Tan[c + d*x])^(3/2 + n)*(a +
 I*a*Tan[c + d*x])^n)/d
```

Rule 7

```
Int[(u_.)*(Px_)^(p_), x_Symbol] :> Int[u*Px^Simplify[p], x] /; PolyQ[Px, x]
 && !RationalQ[p] && FreeQ[p, x] && RationalQ[Simplify[p]]
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
```

```
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\sec(c+dx))^{-3-2n}(a+ia\tan(c+dx))^n\,dx = \left((e\sec(c+dx))^{-3-2n}(a-ia\tan(c+dx))^{\frac{1}{2}(3+2n)}(a+ia\tan(c+\right.$$

$$= \frac{\left(a^2(e\sec(c+dx))^{-3-2n}(a-ia\tan(c+dx))^{\frac{1}{2}(3+2n)}(a+ia\tan(c\right.}{}$$

$$= \frac{\left(a^2(e\sec(c+dx))^{-3-2n}(a-ia\tan(c+dx))^{\frac{1}{2}(3+2n)}(a+ia\tan(c\right.}{d}$$

$$= \frac{\left(2^{-\frac{5}{2}-n}(e\sec(c+dx))^{-3-2n}(a-ia\tan(c+dx))^{-\frac{1}{2}-n+\frac{1}{2}(3+2n)}\left(\frac{a-}{}\right.\right.}{}$$

$$= \frac{i2^{-\frac{3}{2}-n}\,{}_2F_1\left(-\frac{3}{2},\frac{1}{2}(5+2n);-\frac{1}{2};\frac{1}{2}(1+i\tan(c+dx))\right)(e\sec(c+}{3d}$$

Mathematica [A] time = 13.47, size = 166, normalized size = 1.71

$$\frac{i2^{-n-3}e^{-3i(c+dx)}\left(e^{idx}\right)^n\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^{-n}\left(1+e^{2i(c+dx)}\right)^{-n}{}_2F_1\left(-\frac{3}{2},-n-3;-\frac{1}{2};-e^{2i(c+dx)}\right)\sec^{n+3}(c+dx)(\cos(dx)+i}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Sec[c + d*x])^(-3 - 2*n)*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((I/3)*2^(-3 - n)*(E^(I*d*x))^n*Hypergeometric2F1[-3/2, -3 - n, -1/2, -E^((
2*I)*(c + d*x))]*Sec[c + d*x]^(3 + n)*(e*Sec[c + d*x])^(-3 - 2*n)*(a + I*a*
Tan[c + d*x])^n)/(d*E^((3*I)*(c + d*x))*(E^(I*(c + d*x))/(1 + E^((2*I)*(c +
 d*x))))^n*(1 + E^((2*I)*(c + d*x)))^n*(Cos[d*x] + I*Sin[d*x])^n)
```

fricas [F] time = 1.57, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^{-2\,n-3}e^{\left(i\,dnx+i\,cn+n\log\left(\frac{2\,ee^{(i\,dx+i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)+n\log\left(\frac{a}{e}\right)\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(-3-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas
")
```

```
[Out] integral((2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1))^(-2*n - 3)*e^(I*d*
n*x + I*c*n + n*log(2*e*e^(I*d*x + I*c)/(e^(2*I*d*x + 2*I*c) + 1)) + n*log(
a/e)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\sec(dx+c))^{-2\,n-3}(i\,a\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(-3-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((e*sec(d*x + c))^(-2*n - 3)*(I*a*tan(d*x + c) + a)^n, x)
```

maple [F] time = 2.99, size = 0, normalized size = 0.00

$$\int \left(e \sec \left(dx+c\right)\right)^{-3-2n} \left(a+ia \tan \left(dx+c\right)\right)^{n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*sec(d*x+c))^(-3-2*n)*(a+I*a*tan(d*x+c))^n,x)
```

```
[Out] int((e*sec(d*x+c))^(-3-2*n)*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(e \sec \left(dx+c\right)\right)^{-2\,n-3} \left(i\,a \tan \left(dx+c\right)+a\right)^{n} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))^(-3-2*n)*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima
")
```

```
[Out] integrate((e*sec(d*x + c))^(-2*n - 3)*(I*a*tan(d*x + c) + a)^n, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+a\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)^n}{{\left(\frac{e}{\cos\left(c+d\,x\right)}\right)}^{2\,n+3}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^n/(e/cos(c + d*x))^(2*n + 3),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^n/(e/cos(c + d*x))^(2*n + 3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(e \sec \left(c+dx\right)\right)^{-2n-3} \left(ia \left(\tan \left(c+dx\right)-i\right)\right)^{n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*sec(d*x+c))**(-3-2*n)*(a+I*a*tan(d*x+c))**n,x)
```

```
[Out] Integral((e*sec(c + d*x))**(-2*n - 3)*(I*a*(tan(c + d*x) - I))**n, x)
```

3.501 $\int (d\sec(e+fx))^{2n}(a+ia\tan(e+fx))^{-2-n}\,dx$

Optimal. Leaf size=66

$$\frac{i(a+ia\tan(e+fx))^{-n}(d\sec(e+fx))^{2n}\,{}_2F_1\left(3,n;n+1;\frac{1}{2}(1-i\tan(e+fx))\right)}{8a^2fn}$$

```
[Out] 1/8*I*hypergeom([3, n],[1+n],1/2-1/2*I*tan(f*x+e))*(d*sec(f*x+e))^(2*n)/a^2
/f/n/((a+I*a*tan(f*x+e))^n)
```

Rubi [A] time = 0.19, antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3505, 3522, 3487, 68}

$$\frac{i(a+ia\tan(e+fx))^{-n}(d\sec(e+fx))^{2n}\text{Hypergeometric2F1}\left(3,n,n+1,\frac{1}{2}(1-i\tan(e+fx))\right)}{8a^2fn}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(2*n)*(a + I*a*Tan[e + f*x])^(-2 - n),x]
```

```
[Out] ((I/8)*Hypergeometric2F1[3, n, 1 + n, (1 - I*Tan[e + f*x])/2]*(d*Sec[e + f*
x])^(2*n))/(a^2*f*n*(a + I*a*Tan[e + f*x])^n)
```

Rule 68

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a
+ b*x))/(b*c - a*d))])/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]
 && NeQ[b*c - a*d, 0] &&  !IntegerQ[m] && IntegerQ[n]
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3522

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_) + (d_.)*tan[(e_.) +
(f_.)*(x_)])^(n_.), x_Symbol] :> Dist[a^m*c^m, Int[Sec[e + f*x]^(2*m)*(c +
d*Tan[e + f*x])^(n - m), x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && EqQ[b
*c + a*d, 0] && EqQ[a^2 + b^2, 0] && IntegerQ[m] &&  !(IGtQ[n, 0] && (LtQ[m
, 0] || GtQ[m, n]))
```

Rubi steps

$$\int (d\sec(e+fx))^{2n}(a+ia\tan(e+fx))^{-2-n}\,dx = \left((d\sec(e+fx))^{2n}(a-ia\tan(e+fx))^{-n}(a+ia\tan(e+fx))^{-n}\right)\int$$

$$= \frac{\left((d\sec(e+fx))^{2n}(a-ia\tan(e+fx))^{-n}(a+ia\tan(e+fx))^{-n}\right)\int}{a^4}$$

$$= \frac{\left(ia(d\sec(e+fx))^{2n}(a-ia\tan(e+fx))^{-n}(a+ia\tan(e+fx))^{-n}\right)}{f}$$

$$= \frac{i\,{}_2F_1\left(3,n;1+n;\frac{1}{2}(1-i\tan(e+fx))\right)(d\sec(e+fx))^{2n}(a+ia\,\mathrm{ta}}{8a^2fn}$$

Mathematica [B] time = 123.44, size = 165, normalized size = 2.50

$$-\frac{ie^{2ie}2^{n-3}\left(1+e^{2i(e+fx)}\right)^3\left(e^{ifx}\right)^{-n}\left(\frac{e^{i(e+fx)}}{1+e^{2i(e+fx)}}\right)^n {}_2F_1\left(3,3-n;4-n;1+e^{2i(e+fx)}\right)\sec^{2-n}(e+fx)(\cos(fx)+i\sin(fx}{f(n-3)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(2*n)*(a + I*a*Tan[e + f*x])^(-2 - n),x]
```

```
[Out] ((-I)*2^(-3 + n)*E^((2*I)*e)*(E^(I*(e + f*x))/(1 + E^((2*I)*(e + f*x))))^n*
(1 + E^((2*I)*(e + f*x)))^3*Hypergeometric2F1[3, 3 - n, 4 - n, 1 + E^((2*I)
*(e + f*x))]*Sec[e + f*x]^(2 - n)*(d*Sec[e + f*x])^(2*n)*(Cos[f*x] + I*Sin[
f*x])^(2 + n)*(a + I*a*Tan[e + f*x])^(-2 - n))/((E^(I*f*x))^n*f*(-3 + n))
```

fricas [F] time = 0.69, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\left(\frac{2\,de^{\left(ifx+ie\right)}}{e^{\left(2ifx+2ie\right)}+1}\right)^{2n}e^{\left(-ien+\left(-ifn-2if\right)x-(n+2)\log\left(\frac{2\,de^{\left(ifx+ie\right)}}{e^{\left(2ifx+2ie\right)}+1}\right)-(n+2)\log\left(\frac{a}{d}\right)-2ie\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(-2-n),x, algorithm="fric
as")
```

```
[Out] integral((2*d*e^(I*f*x + I*e)/(e^(2*I*f*x + 2*I*e) + 1))^(2*n)*e^(-I*e*n +
(-I*f*n - 2*I*f)*x - (n + 2)*log(2*d*e^(I*f*x + I*e)/(e^(2*I*f*x + 2*I*e) +
 1)) - (n + 2)*log(a/d) - 2*I*e), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{2n}\left(i\,a\tan\left(fx+e\right)+a\right)^{-n-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(-2-n),x, algorithm="giac
")
```

```
[Out] integrate((d*sec(f*x + e))^(2*n)*(I*a*tan(f*x + e) + a)^(-n - 2), x)
```

maple [F] time = 4.83, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{2n}\left(a+ia\tan\left(fx+e\right)\right)^{-2-n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(-2-n),x)
```

```
[Out] int((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(-2-n),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(-2-n),x, algorithm="maxi
ma")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{2\,n}}{\left(a+a\,\tan\left(e+f\,x\right)\,1{}\mathrm{i}\right)^{n+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(2*n)/(a + a*tan(e + f*x)*1i)^(n + 2),x)
```

```
[Out] int((d/cos(e + f*x))^(2*n)/(a + a*tan(e + f*x)*1i)^(n + 2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(2*n)*(a+I*a*tan(f*x+e))**(-2-n),x)
```

```
[Out] Timed out
```

3.502 $\int (d\sec(e+fx))^{2n}(a+ia\tan(e+fx))^{-1-n}\,dx$

Optimal. Leaf size=66

$$\frac{i(a+ia\tan(e+fx))^{-n}(d\sec(e+fx))^{2n}\,{}_2F_1\left(2,n;n+1;\frac{1}{2}(1-i\tan(e+fx))\right)}{4afn}$$

```
[Out] 1/4*I*hypergeom([2, n],[1+n],1/2-1/2*I*tan(f*x+e))*(d*sec(f*x+e))^(2*n)/a/f
/n/((a+I*a*tan(f*x+e))^n)
```

Rubi [A] time = 0.18, antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {3505, 3522, 3487, 68}

$$\frac{i(a+ia\tan(e+fx))^{-n}(d\sec(e+fx))^{2n}\text{Hypergeometric2F1}\left(2,n,n+1,\frac{1}{2}(1-i\tan(e+fx))\right)}{4afn}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(2*n)*(a + I*a*Tan[e + f*x])^(-1 - n),x]
```

```
[Out] ((I/4)*Hypergeometric2F1[2, n, 1 + n, (1 - I*Tan[e + f*x])/2]*(d*Sec[e + f*
x])^(2*n))/(a*f*n*(a + I*a*Tan[e + f*x])^n)
```

Rule 68

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a
+ b*x))/(b*c - a*d))])/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]
 && NeQ[b*c - a*d, 0] &&  !IntegerQ[m] && IntegerQ[n]
```

Rule 3487

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(a^(m - 2)*b*f), Subst[Int[(a - x)^(m/2 - 1)*(a + x)
^(n + m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] &&
EqQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3522

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_.)*((c_) + (d_.)*tan[(e_.) +
(f_.)*(x_)])^(n_.), x_Symbol] :> Dist[a^m*c^m, Int[Sec[e + f*x]^(2*m)*(c +
d*Tan[e + f*x])^(n - m), x], x] /; FreeQ[{a, b, c, d, e, f, n}, x] && EqQ[b
*c + a*d, 0] && EqQ[a^2 + b^2, 0] && IntegerQ[m] &&  !(IGtQ[n, 0] && (LtQ[m
, 0] || GtQ[m, n]))
```

Rubi steps

$$\int (d\sec(e+fx))^{2n}(a+ia\tan(e+fx))^{-1-n}\,dx = \big((d\sec(e+fx))^{2n}(a-ia\tan(e+fx))^{-n}(a+ia\tan(e+fx))^{-n}$$

$$= \frac{\big((d\sec(e+fx))^{2n}(a-ia\tan(e+fx))^{-n}(a+ia\tan(e+fx))^{-n}}{a^2}$$

$$= \frac{\big(ia(d\sec(e+fx))^{2n}(a-ia\tan(e+fx))^{-n}(a+ia\tan(e+fx))}{f}$$

$$= \frac{i\,{}_2F_1\left(2,n;1+n;\frac{1}{2}(1-i\tan(e+fx))\right)(d\sec(e+fx))^{2n}(a+i}{4afn}$$

Mathematica [B] time = 14.30, size = 165, normalized size = 2.50

$$\frac{ie^{ie}2^{n-2}\left(1+e^{2i(e+fx)}\right)^2\left(e^{ifx}\right)^{-n}\left(\frac{e^{i(e+fx)}}{1+e^{2i(e+fx)}}\right)^n {}_2F_1\left(2,2-n;3-n;1+e^{2i(e+fx)}\right)\sec^{1-n}(e+fx)(\cos(fx)+i\sin(fx}{f(n-2)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(2*n)*(a + I*a*Tan[e + f*x])^(-1 - n),x]
```

```
[Out] (I*2^(-2 + n)*E^(I*e)*(E^(I*(e + f*x))/(1 + E^((2*I)*(e + f*x))))^n*(1 + E^
((2*I)*(e + f*x)))^2*Hypergeometric2F1[2, 2 - n, 3 - n, 1 + E^((2*I)*(e + f
*x))]*Sec[e + f*x]^(1 - n)*(d*Sec[e + f*x])^(2*n)*(Cos[f*x] + I*Sin[f*x])^(
1 + n)*(a + I*a*Tan[e + f*x])^(-1 - n))/((E^(I*f*x))^n*f*(-2 + n))
```

fricas [F] time = 0.78, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(\frac{2\,de^{\left(i\,fx+i\,e\right)}}{e^{\left(2i\,fx+2i\,e\right)}+1}\right)^{2\,n} e^{\left(-i\,en+\left(-i\,fn-i\,f\right)x-(n+1)\log\left(\frac{2\,de^{\left(i\,fx+i\,e\right)}}{e^{\left(2i\,fx+2i\,e\right)}+1}\right)-(n+1)\log\left(\frac{a}{d}\right)-i\,e\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(-1-n),x, algorithm="fric
as")
```

```
[Out] integral((2*d*e^(I*f*x + I*e)/(e^(2*I*f*x + 2*I*e) + 1))^(2*n)*e^(-I*e*n +
(-I*f*n - I*f)*x - (n + 1)*log(2*d*e^(I*f*x + I*e)/(e^(2*I*f*x + 2*I*e) + 1
)) - (n + 1)*log(a/d) - I*e), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{2\,n}\left(i\,a\tan\left(fx+e\right)+a\right)^{-n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(-1-n),x, algorithm="giac
")
```

```
[Out] integrate((d*sec(f*x + e))^(2*n)*(I*a*tan(f*x + e) + a)^(-n - 1), x)
```

maple [F] time = 4.73, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{2n}\left(a+ia\tan\left(fx+e\right)\right)^{-1-n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(-1-n),x)
```

```
[Out] int((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(-1-n),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(-1-n),x, algorithm="maxi
ma")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{2\,n}}{\left(a+a\tan\left(e+f\,x\right)\,1\mathrm{i}\right)^{n+1}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(2*n)/(a + a*tan(e + f*x)*1i)^(n + 1),x)
```

```
[Out] int((d/cos(e + f*x))^(2*n)/(a + a*tan(e + f*x)*1i)^(n + 1), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(e+fx\right)\right)^{2n}\left(ia\left(\tan\left(e+fx\right)-i\right)\right)^{-n-1}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(2*n)*(a+I*a*tan(f*x+e))**(-1-n),x)
```

```
[Out] Integral((d*sec(e + f*x))**(2*n)*(I*a*(tan(e + f*x) - I))**(-n - 1), x)
```

3.503 $\int (d\sec(e+fx))^{2n}(a+ia\tan(e+fx))^{-n}\,dx$

Optimal. Leaf size=63

$$\frac{i(a+ia\tan(e+fx))^{-n}(d\sec(e+fx))^{2n}\,{}_2F_1\left(1,n;n+1;\frac{1}{2}(1-i\tan(e+fx))\right)}{2fn}$$

[Out] 1/2*I*hypergeom([1, n],[1+n],1/2-1/2*I*tan(f*x+e))*(d*sec(f*x+e))^(2*n)/f/n/((a+I*a*tan(f*x+e))^n)

Rubi [A] time = 0.07, antiderivative size = 63, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {3492, 3481, 68}

$$\frac{i(a+ia\tan(e+fx))^{-n}(d\sec(e+fx))^{2n}\text{Hypergeometric2F1}\left(1,n,n+1,\frac{1}{2}(1-i\tan(e+fx))\right)}{2fn}$$

Antiderivative was successfully verified.

[In] Int[(d*Sec[e + f*x])^(2*n)/(a + I*a*Tan[e + f*x])^n,x]

[Out] ((I/2)*Hypergeometric2F1[1, n, 1 + n, (1 - I*Tan[e + f*x])/2]*(d*Sec[e + f*x])^(2*n))/(f*n*(a + I*a*Tan[e + f*x])^n)

Rule 68

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a
+ b*x))/(b*c - a*d))])/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]
 && NeQ[b*c - a*d, 0] &&  !IntegerQ[m] && IntegerQ[n]
```

Rule 3481

```
Int[((a_) + (b_.)*tan[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> -Dist[b/d, Su
bst[Int[(a + x)^(n - 1)/(a - x), x], x, b*Tan[c + d*x]], x] /; FreeQ[{a, b,
 c, d, n}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3492

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Dist[((a/d)^(2*IntPart[n])*(a + b*Tan[e + f*x])^Fra
cPart[n]*(a - b*Tan[e + f*x])^FracPart[n])/(d*Sec[e + f*x])^(2*FracPart[n])
, Int[1/(a - b*Tan[e + f*x])^n, x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] &
& EqQ[a^2 + b^2, 0] && EqQ[Simplify[m/2 + n], 0]
```

Rubi steps

$$\int (d\sec(e+fx))^{2n}(a+ia\tan(e+fx))^{-n}\,dx = \left((d\sec(e+fx))^{2n}(a-ia\tan(e+fx))^{-n}(a+ia\tan(e+fx))^{-n}\right)$$

$$= \frac{\left(ia(d\sec(e+fx))^{2n}(a-ia\tan(e+fx))^{-n}(a+ia\tan(e+fx))^{-n}\right.}{f}$$

$$= \frac{i\,{}_2F_1\left(1,n;1+n;\frac{1}{2}(1-i\tan(e+fx))\right)(d\sec(e+fx))^{2n}(a+ia\,\text{t}}{2fn}$$

Mathematica [B] time = 1.16, size = 150, normalized size = 2.38

$$-\frac{i2^{n-1}\left(1+e^{2i(e+fx)}\right)\left(e^{ifx}\right)^{-n}\left(\frac{e^{i(e+fx)}}{1+e^{2i(e+fx)}}\right)^n {}_2F_1\left(1,1-n;2-n;1+e^{2i(e+fx)}\right)\sec^{-n}(e+fx)(\cos(fx)+i\sin(fx))^n(a}{f(n-1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(2*n)/(a + I*a*Tan[e + f*x])^n,x]
```

```
[Out] ((-I)*2^(-1 + n)*(E^(I*(e + f*x))/(1 + E^((2*I)*(e + f*x))))^n*(1 + E^((2*I
)*(e + f*x)))*Hypergeometric2F1[1, 1 - n, 2 - n, 1 + E^((2*I)*(e + f*x))]*(
d*Sec[e + f*x])^(2*n)*(Cos[f*x] + I*Sin[f*x])^n)/((E^(I*f*x))^n*f*(-1 + n)*
Sec[e + f*x]^n*(a + I*a*Tan[e + f*x])^n)
```

fricas [F] time = 0.63, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(\frac{2\,de^{\left(ifx+ie\right)}}{e^{\left(2ifx+2ie\right)}+1}\right)^{2n}e^{\left(-ifnx-ien-n\log\left(\frac{2\,de^{\left(ifx+ie\right)}}{e^{\left(2ifx+2ie\right)}+1}\right)-n\log\left(\frac{a}{d}\right)\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2*n)/((a+I*a*tan(f*x+e))^n),x, algorithm="fricas"
)
```

```
[Out] integral((2*d*e^(I*f*x + I*e)/(e^(2*I*f*x + 2*I*e) + 1))^(2*n)*e^(-I*f*n*x
 - I*e*n - n*log(2*d*e^(I*f*x + I*e)/(e^(2*I*f*x + 2*I*e) + 1)) - n*log(a/d)
), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(fx+e\right)\right)^{2n}}{\left(i\,a\tan\left(fx+e\right)+a\right)^{n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2*n)/((a+I*a*tan(f*x+e))^n),x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(2*n)/(I*a*tan(f*x + e) + a)^n, x)
```

maple [F] time = 1.41, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{2n}\left(a+ia\tan\left(fx+e\right)\right)^{-n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(2*n)/((a+I*a*tan(f*x+e))^n),x)
```

```
[Out] int((d*sec(f*x+e))^(2*n)/((a+I*a*tan(f*x+e))^n),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(fx+e\right)\right)^{2n}}{\left(i\,a\tan\left(fx+e\right)+a\right)^{n}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2*n)/((a+I*a*tan(f*x+e))^n),x, algorithm="maxima"
)
```

```
[Out] integrate((d*sec(f*x + e))^(2*n)/(I*a*tan(f*x + e) + a)^n, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{2\,n}}{\left(a+a\,\tan\left(e+f\,x\right)\,1{}\mathrm{i}\right)^n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(2*n)/(a + a*tan(e + f*x)*1i)^n,x)
[Out] int((d/cos(e + f*x))^(2*n)/(a + a*tan(e + f*x)*1i)^n, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(e+fx\right)\right)^{2n}\left(ia\left(\tan\left(e+fx\right)-i\right)\right)^{-n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(2*n)/((a+I*a*tan(f*x+e))**n),x)
[Out] Integral((d*sec(e + f*x))**(2*n)*(I*a*(tan(e + f*x) - I))**(-n), x)
```

3.504 $\int (d\sec(e+fx))^{2n}(a+ia\tan(e+fx))^{1-n}\,dx$

Optimal. Leaf size=40

$$\frac{ia(a+ia\tan(e+fx))^{-n}(d\sec(e+fx))^{2n}}{fn}$$

```
[Out] I*a*(d*sec(f*x+e))^(2*n)/f/n/((a+I*a*tan(f*x+e))^n)
```

Rubi [A] time = 0.06, antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}} = 0.031$, Rules used = {3493}

$$\frac{ia(a+ia\tan(e+fx))^{-n}(d\sec(e+fx))^{2n}}{fn}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(2*n)*(a + I*a*Tan[e + f*x])^(1 - n),x]
```

```
[Out] (I*a*(d*Sec[e + f*x])^(2*n))/(f*n*(a + I*a*Tan[e + f*x])^n)
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rubi steps

$$\int (d\sec(e+fx))^{2n}(a+ia\tan(e+fx))^{1-n}\,dx=\frac{ia(d\sec(e+fx))^{2n}(a+ia\tan(e+fx))^{-n}}{fn}$$

Mathematica [A] time = 0.50, size = 40, normalized size = 1.00

$$\frac{ia(a+ia\tan(e+fx))^{-n}(d\sec(e+fx))^{2n}}{fn}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(2*n)*(a + I*a*Tan[e + f*x])^(1 - n),x]
```

```
[Out] (I*a*(d*Sec[e + f*x])^(2*n))/(f*n*(a + I*a*Tan[e + f*x])^n)
```

fricas [B] time = 0.76, size = 115, normalized size = 2.88

$$\frac{\left(\frac{2\,de^{\left(ifx+ie\right)}}{e^{\left(2i\,fx+2i\,e\right)}+1}\right)^{2\,n}\left(i\,e^{\left(2i\,fx+2i\,e\right)}+i\right)e^{\left(-i\,en+\left(-i\,fn+i\,f\right)x-2i\,fx-(n-1)\log\left(\frac{2\,de^{\left(i\,fx+i\,e\right)}}{e^{\left(2i\,fx+2i\,e\right)}+1}\right)-(n-1)\log\left(\frac{a}{d}\right)-i\,e\right)}}{2\,fn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(1-n),x, algorithm="frica
s")
```

```
[Out] 1/2*(2*d*e^(I*f*x + I*e)/(e^(2*I*f*x + 2*I*e) + 1))^(2*n)*(I*e^(2*I*f*x + 2
*I*e) + I)*e^(-I*e*n + (-I*f*n + I*f)*x - 2*I*f*x - (n - 1)*log(2*d*e^(I*f*
x + I*e)/(e^(2*I*f*x + 2*I*e) + 1)) - (n - 1)*log(a/d) - I*e)/(f*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d \sec\left(fx+e\right)\right)^{2n} \left(i a \tan\left(fx+e\right)+a\right)^{-n+1} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(1-n),x, algorithm="giac"
)
```

```
[Out] integrate((d*sec(f*x + e))^(2*n)*(I*a*tan(f*x + e) + a)^(-n + 1), x)
```

maple [C] time = 1.66, size = 1291, normalized size = 32.28

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(-n+1),x)
```

```
[Out] I/f*a*2^n*a^(-n)*d^(2*n)*exp(-1/2*I*Pi*(-2*n*csgn(I*exp(I*(f*x+e))/(exp(2*I
*(f*x+e))+1))*csgn(I*d/(exp(2*I*(f*x+e))+1)*exp(I*(f*x+e)))^2-2*n*csgn(I*d)
*csgn(I*d/(exp(2*I*(f*x+e))+1)*exp(I*(f*x+e)))^2-2*n*csgn(I/(exp(2*I*(f*x+e
))+1))*csgn(I*exp(I*(f*x+e))/(exp(2*I*(f*x+e))+1))^2-2*n*csgn(I*exp(I*(f*x+
e)))*csgn(I*exp(I*(f*x+e))/(exp(2*I*(f*x+e))+1))^2-2*csgn(I*exp(I*(f*x+e)))
*csgn(I*exp(2*I*(f*x+e)))^2+2*n*csgn(I/(exp(2*I*(f*x+e))+1))*csgn(I*exp(I*(
f*x+e)))*csgn(I*exp(I*(f*x+e))/(exp(2*I*(f*x+e))+1))-n*csgn(I/(exp(2*I*(f*x
+e))+1))*csgn(I*exp(2*I*(f*x+e)))*csgn(I*exp(2*I*(f*x+e))/(exp(2*I*(f*x+e))
+1))-n*csgn(I*a)*csgn(I*exp(2*I*(f*x+e))/(exp(2*I*(f*x+e))+1))*csgn(I*a/(ex
p(2*I*(f*x+e))+1)*exp(2*I*(f*x+e)))+2*n*csgn(I*exp(I*(f*x+e))/(exp(2*I*(f*x
+e))+1))*csgn(I*d)*csgn(I*d/(exp(2*I*(f*x+e))+1)*exp(I*(f*x+e)))+csgn(I*exp
(2*I*(f*x+e))/(exp(2*I*(f*x+e))+1))^3-n*csgn(I*a/(exp(2*I*(f*x+e))+1)*exp(2
*I*(f*x+e)))^3+2*n*csgn(I*d/(exp(2*I*(f*x+e))+1)*exp(I*(f*x+e)))^3-csgn(I*a
)*csgn(I*a/(exp(2*I*(f*x+e))+1)*exp(2*I*(f*x+e)))^2+2*n*csgn(I*exp(I*(f*x+e
))/(exp(2*I*(f*x+e))+1))^3+csgn(I*a/(exp(2*I*(f*x+e))+1)*exp(2*I*(f*x+e)))^
3+n*csgn(I*a)*csgn(I*a/(exp(2*I*(f*x+e))+1)*exp(2*I*(f*x+e)))^2+csgn(I/(exp
(2*I*(f*x+e))+1))*csgn(I*exp(2*I*(f*x+e)))*csgn(I*exp(2*I*(f*x+e))/(exp(2*I
*(f*x+e))+1))+n*csgn(I*exp(2*I*(f*x+e)))*csgn(I*exp(2*I*(f*x+e))/(exp(2*I*(
f*x+e))+1))^2+n*csgn(I*exp(2*I*(f*x+e))/(exp(2*I*(f*x+e))+1))*csgn(I*a/(exp
(2*I*(f*x+e))+1)*exp(2*I*(f*x+e)))^2+csgn(I*a)*csgn(I*exp(2*I*(f*x+e))/(exp
(2*I*(f*x+e))+1))*csgn(I*a/(exp(2*I*(f*x+e))+1)*exp(2*I*(f*x+e)))+n*csgn(I/
(exp(2*I*(f*x+e))+1))*csgn(I*exp(2*I*(f*x+e))/(exp(2*I*(f*x+e))+1))^2-n*csg
n(I*exp(I*(f*x+e)))^2*csgn(I*exp(2*I*(f*x+e)))+2*n*csgn(I*exp(I*(f*x+e)))*c
sgn(I*exp(2*I*(f*x+e)))^2+csgn(I*exp(2*I*(f*x+e)))^3-csgn(I*exp(2*I*(f*x+e)
)/(exp(2*I*(f*x+e))+1))*csgn(I*a/(exp(2*I*(f*x+e))+1)*exp(2*I*(f*x+e)))^2+c
sgn(I*exp(I*(f*x+e)))^2*csgn(I*exp(2*I*(f*x+e)))-csgn(I*exp(2*I*(f*x+e)))*c
sgn(I*exp(2*I*(f*x+e))/(exp(2*I*(f*x+e))+1))^2-csgn(I/(exp(2*I*(f*x+e))+1))
*csgn(I*exp(2*I*(f*x+e))/(exp(2*I*(f*x+e))+1))^2-n*csgn(I*exp(2*I*(f*x+e)))
^3-n*csgn(I*exp(2*I*(f*x+e))/(exp(2*I*(f*x+e))+1))^3))/n*(exp(2*I*(f*x+e))+
1)^(-n)
```

maxima [B] time = 0.49, size = 137, normalized size = 3.42

$$\frac{i a^{-n+1} d^{2n} e^{\left(-n \log\left(\frac{\sin\left(fx+e\right)}{\cos\left(fx+e\right)+1}+1\right) - n \log\left(\frac{\sin\left(fx+e\right)}{\cos\left(fx+e\right)+1}-1\right) - n \log\left(-\frac{2i \sin\left(fx+e\right)}{\cos\left(fx+e\right)+1}+\frac{\sin\left(fx+e\right)^2}{\left(\cos\left(fx+e\right)+1\right)^2}-1\right) + 2n \log\left(-\frac{\sin\left(fx+e\right)^2}{\left(\cos\left(fx+e\right)+1\right)^2}-1\right)\right)}}{fn}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(1-n),x, algorithm="maxim
a")
```

```
[Out] I*a^(-n + 1)*d^(2*n)*e^(-n*log(sin(f*x + e)/(cos(f*x + e) + 1) + 1) - n*log
(sin(f*x + e)/(cos(f*x + e) + 1) - 1) - n*log(-2*I*sin(f*x + e)/(cos(f*x +
e) + 1) + sin(f*x + e)^2/(cos(f*x + e) + 1)^2 - 1) + 2*n*log(-sin(f*x + e)^
2/(cos(f*x + e) + 1)^2 - 1))/(f*n)
```

mupad [B] time = 4.59, size = 62, normalized size = 1.55

$$\frac{a\,{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{2\,n}\,1{}\mathrm{i}}{f\,n\,{\left(\frac{a\,\left(\cos\left(2\,e+2\,f\,x\right)+1+\sin\left(2\,e+2\,f\,x\right)\,1{}\mathrm{i}\right)}{2\,{\cos\left(e+f\,x\right)}^2}\right)}^n}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(2*n)*(a + a*tan(e + f*x)*1i)^(1 - n),x)
```

```
[Out] (a*(d/cos(e + f*x))^(2*n)*1i)/(f*n*((a*(cos(2*e + 2*f*x) + sin(2*e + 2*f*x)
*1i + 1))/(2*cos(e + f*x)^2))^n)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d \sec \left(e + f x\right)\right)^{2n} \left(i a \left(\tan \left(e + f x\right) - i\right)\right)^{1-n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(2*n)*(a+I*a*tan(f*x+e))**(1-n),x)
```

```
[Out] Integral((d*sec(e + f*x))**(2*n)*(I*a*(tan(e + f*x) - I))**(1 - n), x)
```

3.505 $\int (d\sec(e+fx))^{2n}(a+ia\tan(e+fx))^{2-n}\,dx$

Optimal. Leaf size=92

$$\frac{2ia^2(a+ia\tan(e+fx))^{-n}(d\sec(e+fx))^{2n}}{fn(n+1)}+\frac{ia(a+ia\tan(e+fx))^{1-n}(d\sec(e+fx))^{2n}}{f(n+1)}$$

```
[Out] I*a*(d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(1-n)/f/(1+n)+2*I*a^2*(d*sec(f*
x+e))^(2*n)/f/n/(1+n)/((a+I*a*tan(f*x+e))^n)
```

Rubi [A] time = 0.13, antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {3494, 3493}

$$\frac{2ia^2(a+ia\tan(e+fx))^{-n}(d\sec(e+fx))^{2n}}{fn(n+1)}+\frac{ia(a+ia\tan(e+fx))^{1-n}(d\sec(e+fx))^{2n}}{f(n+1)}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(2*n)*(a + I*a*Tan[e + f*x])^(2 - n),x]
```

```
[Out] (I*a*(d*Sec[e + f*x])^(2*n)*(a + I*a*Tan[e + f*x])^(1 - n))/(f*(1 + n)) + (
(2*I)*a^2*(d*Sec[e + f*x])^(2*n))/(f*n*(1 + n)*(a + I*a*Tan[e + f*x])^n)
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] && !Integ
erQ[n]
```

Rubi steps

$$\int (d\sec(e+fx))^{2n}(a+ia\tan(e+fx))^{2-n}\,dx=\frac{ia(d\sec(e+fx))^{2n}(a+ia\tan(e+fx))^{1-n}}{f(1+n)}+\frac{(2a)\int (d\sec(e+ \ldots}{}$$
$$=\frac{ia(d\sec(e+fx))^{2n}(a+ia\tan(e+fx))^{1-n}}{f(1+n)}+\frac{2ia^2(d\sec(e+fx \ldots}{\ldots}$$

Mathematica [A] time = 1.17, size = 61, normalized size = 0.66

$$-\frac{a^2(n\tan(e+fx)-i(n+2))(a+ia\tan(e+fx))^{-n}(d\sec(e+fx))^{2n}}{fn(n+1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(2*n)*(a + I*a*Tan[e + f*x])^(2 - n),x]
```

```
[Out] -((a^2*(d*Sec[e + f*x])^(2*n)*((-I)*(2 + n) + n*Tan[e + f*x]))/(f*n*(1 + n)
*(a + I*a*Tan[e + f*x])^n))
```

fricas [A] time = 0.97, size = 139, normalized size = 1.51

$$\frac{\left((in+i)e^{(4ifx+4ie)}+(in+2i)e^{(2ifx+2ie)}+i\right)\left(\frac{2de^{(ifx+ie)}}{e^{(2ifx+2ie)}+1}\right)^{2n}e^{\left(-ien+(-ifn+2if)x-4ifx-(n-2)\log\left(\frac{2de^{(ifx+ie)}}{e^{(2ifx+2ie)}+1}\right)-(n-2)\log\left(\frac{a}{d}\right)\right.}}{2\left(fn^2+fn\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(2-n),x, algorithm="frica
s")
```

```
[Out] 1/2*((I*n + I)*e^(4*I*f*x + 4*I*e) + (I*n + 2*I)*e^(2*I*f*x + 2*I*e) + I)*(
2*d*e^(I*f*x + I*e)/(e^(2*I*f*x + 2*I*e) + 1))^(2*n)*e^(-I*e*n + (-I*f*n +
2*I*f)*x - 4*I*f*x - (n - 2)*log(2*d*e^(I*f*x + I*e)/(e^(2*I*f*x + 2*I*e) +
 1)) - (n - 2)*log(a/d) - 2*I*e)/(f*n^2 + f*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{2n}\left(ia\tan\left(fx+e\right)+a\right)^{-n+2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(2-n),x, algorithm="giac"
)
```

```
[Out] integrate((d*sec(f*x + e))^(2*n)*(I*a*tan(f*x + e) + a)^(-n + 2), x)
```

maple [F] time = 3.62, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{2n}\left(a+ia\tan\left(fx+e\right)\right)^{2-n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(2-n),x)
```

```
[Out] int((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(2-n),x)
```

maxima [B] time = 0.68, size = 304, normalized size = 3.30

$$\frac{2^{n+1}a^2d^{2n}\cos\left(n\arctan\left(\sin\left(2fx+2e\right),\cos\left(2fx+2e\right)+1\right)\right)-i\cdot 2^{n+1}a^2d^{2n}\sin\left(n\arctan\left(\sin\left(2fx+2e\right),c\right.\right.}{\left(-ia^nn^2-ia^nn+\left(-ia^nn^2\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(2-n),x, algorithm="maxim
a")
```

```
[Out] (2^(n + 1)*a^2*d^(2*n)*cos(n*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1
)) - I*2^(n + 1)*a^2*d^(2*n)*sin(n*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*
e) + 1)) + 2*(a^2*d^(2*n)*n + a^2*d^(2*n))*2^n*cos(-2*f*x + n*arctan2(sin(2
*f*x + 2*e), cos(2*f*x + 2*e) + 1) - 2*e) - (2*I*a^2*d^(2*n)*n + 2*I*a^2*d^
(2*n))*2^n*sin(-2*f*x + n*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1) -
 2*e))/((-I*a^n*n^2 - I*a^n*n + (-I*a^n*n^2 - I*a^n*n)*cos(2*f*x + 2*e) + (
a^n*n^2 + a^n*n)*sin(2*f*x + 2*e))*(cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2
 + 2*cos(2*f*x + 2*e) + 1)^(1/2*n)*f)
```

mupad [B] time = 7.82, size = 260, normalized size = 2.83

$$-e^{-e\,4i-f\,x\,4i}\left(\frac{d}{\frac{e^{-e\,1i-f\,x\,1i}}{2}+\frac{e^{e\,1i+f\,x\,1i}}{2}}\right)^{2\,n}\left(\frac{\left(a-\frac{a\left(e^{e\,2i+f\,x\,2i}\,1i-i\right)1i}{e^{e\,2i+f\,x\,2i}+1}\right)^{2-n}}{2\,f\,n\,\left(n\,1i+1i\right)}+\frac{e^{e\,2i+f\,x\,2i}\left(a-\frac{a\left(e^{e\,2i+f\,x\,2i}\,1i-i\right)1i}{e^{e\,2i+f\,x\,2i}+1}\right)^{2-n}\,\left(n+2\right)}{2\,f\,n\,\left(n\,1i+1i\right)}+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(2*n)*(a + a*tan(e + f*x)*1i)^(2 - n),x)
```

```
[Out] -exp(- e*4i - f*x*4i)*(d/(exp(- e*1i - f*x*1i)/2 + exp(e*1i + f*x*1i)/2))^(
2*n)*((a - (a*(exp(e*2i + f*x*2i)*1i - 1i)*1i)/(exp(e*2i + f*x*2i) + 1))^(2
 - n)/(2*f*n*(n*1i + 1i)) + (exp(e*2i + f*x*2i)*(a - (a*(exp(e*2i + f*x*2i)
*1i - 1i)*1i)/(exp(e*2i + f*x*2i) + 1))^(2 - n)*(n + 2))/(2*f*n*(n*1i + 1i)
) + (exp(e*4i + f*x*4i)*(a - (a*(exp(e*2i + f*x*2i)*1i - 1i)*1i)/(exp(e*2i
+ f*x*2i) + 1))^(2 - n)*(n + 1))/(2*f*n*(n*1i + 1i)))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(e+fx\right)\right)^{2n}\left(ia\left(\tan\left(e+fx\right)-i\right)\right)^{2-n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(2*n)*(a+I*a*tan(f*x+e))**(2-n),x)
```

```
[Out] Integral((d*sec(e + f*x))**(2*n)*(I*a*(tan(e + f*x) - I))**(2 - n), x)
```

3.506 $\int (d\sec(e+fx))^{2n}(a+ia\tan(e+fx))^{3-n}\,dx$

Optimal. Leaf size=148

$$\frac{8ia^3(a+ia\tan(e+fx))^{-n}(d\sec(e+fx))^{2n}}{fn\left(n^2+3n+2\right)}+\frac{4ia^2(a+ia\tan(e+fx))^{1-n}(d\sec(e+fx))^{2n}}{f\left(n^2+3n+2\right)}+\frac{ia(a+ia\tan(e+fx))^{2}}{f(n+}$$

```
[Out] 4*I*a^2*(d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(1-n)/f/(n^2+3*n+2)+I*a*(d*
sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(2-n)/f/(2+n)+8*I*a^3*(d*sec(f*x+e))^(
2*n)/f/n/(n^2+3*n+2)/((a+I*a*tan(f*x+e))^n)
```

Rubi [A] time = 0.21, antiderivative size = 148, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 32, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {3494, 3493}

$$\frac{4ia^2(a+ia\tan(e+fx))^{1-n}(d\sec(e+fx))^{2n}}{f\left(n^2+3n+2\right)}+\frac{8ia^3(a+ia\tan(e+fx))^{-n}(d\sec(e+fx))^{2n}}{fn\left(n^2+3n+2\right)}+\frac{ia(a+ia\tan(e+fx))^{2}}{f(n+}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(2*n)*(a + I*a*Tan[e + f*x])^(3 - n),x]
```

```
[Out] ((4*I)*a^2*(d*Sec[e + f*x])^(2*n)*(a + I*a*Tan[e + f*x])^(1 - n))/(f*(2 + 3
*n + n^2)) + (I*a*(d*Sec[e + f*x])^(2*n)*(a + I*a*Tan[e + f*x])^(2 - n))/(f
*(2 + n)) + ((8*I)*a^3*(d*Sec[e + f*x])^(2*n))/(f*n*(2 + 3*n + n^2)*(a + I*
a*Tan[e + f*x])^n)
```

Rule 3493

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(2*b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^
(n - 1))/(f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0]
&& EqQ[Simplify[m/2 + n - 1], 0]
```

Rule 3494

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m, n}, x] && EqQ[a^2 + b^2, 0] && IGtQ[Simplify[m/2 + n - 1], 0] &&  !Integ
erQ[n]
```

Rubi steps

$$\begin{aligned}\int (d\sec(e+fx))^{2n}(a+ia\tan(e+fx))^{3-n}\,dx &= \frac{ia(d\sec(e+fx))^{2n}(a+ia\tan(e+fx))^{2-n}}{f(2+n)}+\frac{(4a)\int (d\sec(e+fx)}{}\\ &= \frac{4ia^2(d\sec(e+fx))^{2n}(a+ia\tan(e+fx))^{1-n}}{f\left(2+3n+n^2\right)}+\frac{ia(d\sec(e+fx))^{2}}{f}\\ &= \frac{4ia^2(d\sec(e+fx))^{2n}(a+ia\tan(e+fx))^{1-n}}{f\left(2+3n+n^2\right)}+\frac{ia(d\sec(e+fx))^{2}}{f}\end{aligned}$$

Mathematica [A] time = 1.96, size = 129, normalized size = 0.87

$$\frac{ia^3\sec^2(e+fx)(\cos(3fx)+i\sin(3fx))(a+ia\tan(e+fx))^{-n}(d\sec(e+fx))^{2n}\left(\left(n^2+3n+4\right)\cos(2(e+fx))+in\right.}{fn(n+1)(n+2)(\cos(fx)+i\sin(fx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(2*n)*(a + I*a*Tan[e + f*x])^(3 - n),x]
```

```
[Out] (I*a^3*Sec[e + f*x]^2*(d*Sec[e + f*x])^(2*n)*(Cos[3*f*x] + I*Sin[3*f*x])*(2
*(2 + n) + (4 + 3*n + n^2)*Cos[2*(e + f*x)] + I*n*(3 + n)*Sin[2*(e + f*x)])
)/(f*n*(1 + n)*(2 + n)*(Cos[f*x] + I*Sin[f*x])^3*(a + I*a*Tan[e + f*x])^n)
```

fricas [A] time = 0.61, size = 171, normalized size = 1.16

$$\frac{\left(\left(in^2+3in+2i\right)e^{\left(6ifx+6ie\right)}+\left(in^2+5in+6i\right)e^{\left(4ifx+4ie\right)}+\left(2in+6i\right)e^{\left(2ifx+2ie\right)}+2i\right)\left(\frac{2de^{\left(ifx+ie\right)}}{e^{\left(2ifx+2ie\right)}+1}\right)^{2n}e^{\left(-ien+(-\right.}}{2\left(fn^3+3fn^2+2fn\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(3-n),x, algorithm="frica
s")
```

```
[Out] 1/2*((I*n^2 + 3*I*n + 2*I)*e^(6*I*f*x + 6*I*e) + (I*n^2 + 5*I*n + 6*I)*e^(4
*I*f*x + 4*I*e) + (2*I*n + 6*I)*e^(2*I*f*x + 2*I*e) + 2*I)*(2*d*e^(I*f*x +
I*e)/(e^(2*I*f*x + 2*I*e) + 1))^(2*n)*e^(-I*e*n + (-I*f*n + 3*I*f)*x - 6*I*
f*x - (n - 3)*log(2*d*e^(I*f*x + I*e)/(e^(2*I*f*x + 2*I*e) + 1)) - (n - 3)*
log(a/d) - 3*I*e)/(f*n^3 + 3*f*n^2 + 2*f*n)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(d\sec\left(fx+e\right)\right)^{2n}\left(ia\tan\left(fx+e\right)+a\right)^{-n+3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(3-n),x, algorithm="giac"
)
```

```
[Out] integrate((d*sec(f*x + e))^(2*n)*(I*a*tan(f*x + e) + a)^(-n + 3), x)
```

maple [F] time = 3.78, size = 0, normalized size = 0.00

$$\int\left(d\sec\left(fx+e\right)\right)^{2n}\left(a+ia\tan\left(fx+e\right)\right)^{3-n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(3-n),x)
```

```
[Out] int((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(3-n),x)
```

maxima [B] time = 1.59, size = 617, normalized size = 4.17

$$\frac{2^{n+3}a^3d^{2n}\cos\left(n\arctan\left(\sin\left(2fx+2e\right),\cos\left(2fx+2e\right)+1\right)\right)-i\cdot2^{n+3}a^3d^{2n}\sin\left(n\arctan\left(\sin\left(2fx+2e\right)\right.\right.}{\left(\left(-ia^nn^3-3ia^nn^2-2ia^nn\right)\left(\cos\left(2fx+2e\right.\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(2*n)*(a+I*a*tan(f*x+e))^(3-n),x, algorithm="maxim
a")
```

```
[Out] (2^(n + 3)*a^3*d^(2*n)*cos(n*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1
)) - I*2^(n + 3)*a^3*d^(2*n)*sin(n*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*
e) + 1)) + 8*(a^3*d^(2*n)*n + 2*a^3*d^(2*n))*2^n*cos(-2*f*x + n*arctan2(sin
```

```
(2*f*x + 2*e), cos(2*f*x + 2*e) + 1) - 2*e) + 4*(a^3*d^(2*n)*n^2 + 3*a^3*d^
(2*n)*n + 2*a^3*d^(2*n))*2^n*cos(-4*f*x + n*arctan2(sin(2*f*x + 2*e), cos(2
*f*x + 2*e) + 1) - 4*e) - (8*I*a^3*d^(2*n)*n + 16*I*a^3*d^(2*n))*2^n*sin(-2
*f*x + n*arctan2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1) - 2*e) - (4*I*a^3*
d^(2*n)*n^2 + 12*I*a^3*d^(2*n)*n + 8*I*a^3*d^(2*n))*2^n*sin(-4*f*x + n*arct
an2(sin(2*f*x + 2*e), cos(2*f*x + 2*e) + 1) - 4*e))/(((-I*a^n*n^3 - 3*I*a^n
*n^2 - 2*I*a^n*n)*(cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x +
2*e) + 1)^(1/2*n)*cos(4*f*x + 4*e) + (a^n*n^3 + 3*a^n*n^2 + 2*a^n*n)*(cos(2
*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e) + 1)^(1/2*n)*sin(4*
f*x + 4*e) + (-I*a^n*n^3 - 3*I*a^n*n^2 - 2*I*a^n*n + (-2*I*a^n*n^3 - 6*I*a^
n*n^2 - 4*I*a^n*n)*cos(2*f*x + 2*e) + 2*(a^n*n^3 + 3*a^n*n^2 + 2*a^n*n)*sin
(2*f*x + 2*e))*(cos(2*f*x + 2*e)^2 + sin(2*f*x + 2*e)^2 + 2*cos(2*f*x + 2*e
) + 1)^(1/2*n))*f)
```

mupad [B] time = 12.47, size = 321, normalized size = 2.17

$$-\left(\cos\left(6\,e+6\,f\,x\right)-\sin\left(6\,e+6\,f\,x\right)\,1\mathrm{i}\right)\,{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{2\,n}\,\left(\frac{{\left(a+\frac{a\,\sin\left(e+f\,x\right)\,1\mathrm{i}}{\cos\left(e+f\,x\right)}\right)}^{3-n}}{f\,n\,\left(n^2\,1\mathrm{i}+n\,3\mathrm{i}+2\mathrm{i}\right)}+\frac{\left(\cos\left(4\,e+4\,f\,x\right)+\sin\left(4\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(2*n)*(a + a*tan(e + f*x)*1i)^(3 - n),x)
```

```
[Out] -(cos(6*e + 6*f*x) - sin(6*e + 6*f*x)*1i)*(d/cos(e + f*x))^(2*n)*((a + (a*s
in(e + f*x)*1i)/cos(e + f*x))^(3 - n)/(f*n*(n*3i + n^2*1i + 2i)) + ((cos(4*
e + 4*f*x) + sin(4*e + 4*f*x)*1i)*(a + (a*sin(e + f*x)*1i)/cos(e + f*x))^(3
 - n)*(5*n + n^2 + 6))/(2*f*n*(n*3i + n^2*1i + 2i)) + ((cos(6*e + 6*f*x) +
sin(6*e + 6*f*x)*1i)*(a + (a*sin(e + f*x)*1i)/cos(e + f*x))^(3 - n)*(3*n +
n^2 + 2))/(2*f*n*(n*3i + n^2*1i + 2i)) + ((2*n + 6)*(cos(2*e + 2*f*x) + sin
(2*e + 2*f*x)*1i)*(a + (a*sin(e + f*x)*1i)/cos(e + f*x))^(3 - n))/(2*f*n*(n
*3i + n^2*1i + 2i)))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(e+fx\right)\right)^{2n}\left(ia\left(\tan\left(e+fx\right)-i\right)\right)^{3-n}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(2*n)*(a+I*a*tan(f*x+e))**(3-n),x)
```

```
[Out] Integral((d*sec(e + f*x))**(2*n)*(I*a*(tan(e + f*x) - I))**(3 - n), x)
```

3.507 $\int \sec^6(c+dx)(a+b\tan(c+dx))\,dx$

Optimal. Leaf size=60

$$\frac{a\tan^5(c+dx)}{5d}+\frac{2a\tan^3(c+dx)}{3d}+\frac{a\tan(c+dx)}{d}+\frac{b\sec^6(c+dx)}{6d}$$

```
[Out] 1/6*b*sec(d*x+c)^6/d+a*tan(d*x+c)/d+2/3*a*tan(d*x+c)^3/d+1/5*a*tan(d*x+c)^5
/d
```

Rubi [A] time = 0.04, antiderivative size = 60, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {3486, 3767}

$$\frac{a\tan^5(c+dx)}{5d}+\frac{2a\tan^3(c+dx)}{3d}+\frac{a\tan(c+dx)}{d}+\frac{b\sec^6(c+dx)}{6d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6*(a + b*Tan[c + d*x]),x]
```

```
[Out] (b*Sec[c + d*x]^6)/(6*d) + (a*Tan[c + d*x])/d + (2*a*Tan[c + d*x]^3)/(3*d)
+ (a*Tan[c + d*x]^5)/(5*d)
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3767

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rubi steps

$$\begin{aligned}
\int \sec^6(c+dx)(a+b\tan(c+dx))\,dx &= \frac{b\sec^6(c+dx)}{6d}+a\int \sec^6(c+dx)\,dx\\
&= \frac{b\sec^6(c+dx)}{6d}-\frac{a\,\text{Subst}\left(\int \left(1+2x^2+x^4\right)dx,x,-\tan(c+dx)\right)}{d}\\
&= \frac{b\sec^6(c+dx)}{6d}+\frac{a\tan(c+dx)}{d}+\frac{2a\tan^3(c+dx)}{3d}+\frac{a\tan^5(c+dx)}{5d}
\end{aligned}$$

Mathematica [A] time = 0.18, size = 53, normalized size = 0.88

$$\frac{a\left(\frac{1}{5}\tan^5(c+dx)+\frac{2}{3}\tan^3(c+dx)+\tan(c+dx)\right)}{d}+\frac{b\sec^6(c+dx)}{6d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6*(a + b*Tan[c + d*x]),x]
```

```
[Out] (b*Sec[c + d*x]^6)/(6*d) + (a*(Tan[c + d*x] + (2*Tan[c + d*x]^3)/3 + Tan[c
+ d*x]^5/5))/d
```

fricas [A] time = 1.64, size = 57, normalized size = 0.95

$$\frac{2\left(8\,a\cos\left(dx+c\right)^{5}+4\,a\cos\left(dx+c\right)^{3}+3\,a\cos\left(dx+c\right)\right)\sin\left(dx+c\right)+5\,b}{30\,d\cos\left(dx+c\right)^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+b*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/30*(2*(8*a*cos(d*x + c)^5 + 4*a*cos(d*x + c)^3 + 3*a*cos(d*x + c))*sin(d*
x + c) + 5*b)/(d*cos(d*x + c)^6)
```

giac [A] time = 0.32, size = 70, normalized size = 1.17

$$\frac{5\,b\tan\left(dx+c\right)^{6}+6\,a\tan\left(dx+c\right)^{5}+15\,b\tan\left(dx+c\right)^{4}+20\,a\tan\left(dx+c\right)^{3}+15\,b\tan\left(dx+c\right)^{2}+30\,a\tan\left(dx+\right.}{30\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+b*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/30*(5*b*tan(d*x + c)^6 + 6*a*tan(d*x + c)^5 + 15*b*tan(d*x + c)^4 + 20*a*
tan(d*x + c)^3 + 15*b*tan(d*x + c)^2 + 30*a*tan(d*x + c))/d
```

maple [A] time = 0.37, size = 48, normalized size = 0.80

$$\frac{-a\left(-\frac{8}{15}-\frac{\left(\sec^{4}(dx+c)\right)}{5}-\frac{4\left(\sec^{2}(dx+c)\right)}{15}\right)\tan\left(dx+c\right)+\frac{b}{6\cos(dx+c)^{6}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6*(a+b*tan(d*x+c)),x)
```

```
[Out] 1/d*(-a*(-8/15-1/5*sec(d*x+c)^4-4/15*sec(d*x+c)^2)*tan(d*x+c)+1/6*b/cos(d*x
+c)^6)
```

maxima [A] time = 0.33, size = 70, normalized size = 1.17

$$\frac{5\,b\tan\left(dx+c\right)^{6}+6\,a\tan\left(dx+c\right)^{5}+15\,b\tan\left(dx+c\right)^{4}+20\,a\tan\left(dx+c\right)^{3}+15\,b\tan\left(dx+c\right)^{2}+30\,a\tan\left(dx+\right.}{30\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+b*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/30*(5*b*tan(d*x + c)^6 + 6*a*tan(d*x + c)^5 + 15*b*tan(d*x + c)^4 + 20*a*
tan(d*x + c)^3 + 15*b*tan(d*x + c)^2 + 30*a*tan(d*x + c))/d
```

mupad [B] time = 3.67, size = 68, normalized size = 1.13

$$\frac{\frac{b\tan(c+d\,x)^{6}}{6}+\frac{a\tan(c+d\,x)^{5}}{5}+\frac{b\tan(c+d\,x)^{4}}{2}+\frac{2\,a\tan(c+d\,x)^{3}}{3}+\frac{b\tan(c+d\,x)^{2}}{2}+a\tan\left(c+d\,x\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))/cos(c + d*x)^6,x)
```

```
[Out] (a*tan(c + d*x) + (2*a*tan(c + d*x)^3)/3 + (a*tan(c + d*x)^5)/5 + (b*tan(c
+ d*x)^2)/2 + (b*tan(c + d*x)^4)/2 + (b*tan(c + d*x)^6)/6)/d
```

sympy [A] time = 4.14, size = 56, normalized size = 0.93

$$\begin{cases} \frac{a\left(\frac{\tan^5(c+dx)}{5}+\frac{2\tan^3(c+dx)}{3}+\tan(c+dx)\right)+\frac{b\sec^6(c+dx)}{6}}{d} & \text{for } d \neq 0 \\ x\left(a+b\tan(c)\right)\sec^6(c) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6*(a+b*tan(d*x+c)),x)
```

```
[Out] Piecewise(((a*(tan(c + d*x)**5/5 + 2*tan(c + d*x)**3/3 + tan(c + d*x)) + b*
sec(c + d*x)**6/6)/d, Ne(d, 0)), (x*(a + b*tan(c))*sec(c)**6, True))
```

3.508 $\int \sec^5(c+dx)(a+b\tan(c+dx))\,dx$

Optimal. Leaf size=74

$$\frac{3a\tanh^{-1}(\sin(c+dx))}{8d}+\frac{a\tan(c+dx)\sec^3(c+dx)}{4d}+\frac{3a\tan(c+dx)\sec(c+dx)}{8d}+\frac{b\sec^5(c+dx)}{5d}$$

```
[Out] 3/8*a*arctanh(sin(d*x+c))/d+1/5*b*sec(d*x+c)^5/d+3/8*a*sec(d*x+c)*tan(d*x+c
)/d+1/4*a*sec(d*x+c)^3*tan(d*x+c)/d
```

Rubi [A] time = 0.05, antiderivative size = 74, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {3486, 3768, 3770}

$$\frac{3a\tanh^{-1}(\sin(c+dx))}{8d}+\frac{a\tan(c+dx)\sec^3(c+dx)}{4d}+\frac{3a\tan(c+dx)\sec(c+dx)}{8d}+\frac{b\sec^5(c+dx)}{5d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^5*(a + b*Tan[c + d*x]),x]
```

```
[Out] (3*a*ArcTanh[Sin[c + d*x]])/(8*d) + (b*Sec[c + d*x]^5)/(5*d) + (3*a*Sec[c +
 d*x]*Tan[c + d*x])/(8*d) + (a*Sec[c + d*x]^3*Tan[c + d*x])/(4*d)
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\int \sec^5(c+dx)(a+b\tan(c+dx))\,dx&=\frac{b\sec^5(c+dx)}{5d}+a\int \sec^5(c+dx)\,dx\\&=\frac{b\sec^5(c+dx)}{5d}+\frac{a\sec^3(c+dx)\tan(c+dx)}{4d}+\frac{1}{4}(3a)\int \sec^3(c+dx)\,dx\\&=\frac{b\sec^5(c+dx)}{5d}+\frac{3a\sec(c+dx)\tan(c+dx)}{8d}+\frac{a\sec^3(c+dx)\tan(c+dx)}{4d}\\&=\frac{3a\tanh^{-1}(\sin(c+dx))}{8d}+\frac{b\sec^5(c+dx)}{5d}+\frac{3a\sec(c+dx)\tan(c+dx)}{8d}+\end{aligned}$$

Mathematica [A] time = 0.21, size = 68, normalized size = 0.92

$$\frac{a\tan(c+dx)\sec^3(c+dx)}{4d}+\frac{3a\left(\tanh^{-1}(\sin(c+dx))+\tan(c+dx)\sec(c+dx)\right)}{8d}+\frac{b\sec^5(c+dx)}{5d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^5*(a + b*Tan[c + d*x]),x]
```

```
[Out] (b*Sec[c + d*x]^5)/(5*d) + (a*Sec[c + d*x]^3*Tan[c + d*x])/(4*d) + (3*a*(Ar
cTanh[Sin[c + d*x]] + Sec[c + d*x]*Tan[c + d*x]))/(8*d)
```

fricas [A] time = 0.60, size = 88, normalized size = 1.19

$$\frac{15\,a\cos\left(dx+c\right)^{5}\log\left(\sin\left(dx+c\right)+1\right)-15\,a\cos\left(dx+c\right)^{5}\log\left(-\sin\left(dx+c\right)+1\right)+10\left(3\,a\cos\left(dx+c\right)^{3}+2\,a\right.}{80\,d\cos\left(dx+c\right)^{5}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+b*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/80*(15*a*cos(d*x + c)^5*log(sin(d*x + c) + 1) - 15*a*cos(d*x + c)^5*log(-
sin(d*x + c) + 1) + 10*(3*a*cos(d*x + c)^3 + 2*a*cos(d*x + c))*sin(d*x + c)
 + 16*b)/(d*cos(d*x + c)^5)
```

giac [B] time = 0.89, size = 141, normalized size = 1.91

$$\frac{15\,a\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-15\,a\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)+\frac{2\left(25\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{9}-40\,b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{8}-10\,a\tan\left(\right.\right.}{}}{40\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+b*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/40*(15*a*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 15*a*log(abs(tan(1/2*d*x +
1/2*c) - 1)) + 2*(25*a*tan(1/2*d*x + 1/2*c)^9 - 40*b*tan(1/2*d*x + 1/2*c)^8
 - 10*a*tan(1/2*d*x + 1/2*c)^7 - 80*b*tan(1/2*d*x + 1/2*c)^4 + 10*a*tan(1/2
*d*x + 1/2*c)^3 - 25*a*tan(1/2*d*x + 1/2*c) - 8*b)/(tan(1/2*d*x + 1/2*c)^2
- 1)^5)/d
```

maple [A] time = 0.38, size = 74, normalized size = 1.00

$$\frac{a\left(\sec^{3}\left(dx+c\right)\right)\tan\left(dx+c\right)}{4d}+\frac{3a\sec\left(dx+c\right)\tan\left(dx+c\right)}{8d}+\frac{3a\ln\left(\sec\left(dx+c\right)+\tan\left(dx+c\right)\right)}{8d}+\frac{b}{5d\cos\left(dx+c\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^5*(a+b*tan(d*x+c)),x)
```

```
[Out] 1/4*a*sec(d*x+c)^3*tan(d*x+c)/d+3/8*a*sec(d*x+c)*tan(d*x+c)/d+3/8/d*a*ln(se
c(d*x+c)+tan(d*x+c))+1/5/d*b/cos(d*x+c)^5
```

maxima [A] time = 0.33, size = 86, normalized size = 1.16

$$-\frac{5\,a\left(\frac{2\left(3\,\sin\left(dx+c\right)^{3}-5\,\sin\left(dx+c\right)\right)}{\sin\left(dx+c\right)^{4}-2\,\sin\left(dx+c\right)^{2}+1}-3\,\log\left(\sin\left(dx+c\right)+1\right)+3\,\log\left(\sin\left(dx+c\right)-1\right)\right)-\frac{16\,b}{\cos\left(dx+c\right)^{5}}}{80\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+b*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/80*(5*a*(2*(3*sin(d*x + c)^3 - 5*sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(d
*x + c)^2 + 1) - 3*log(sin(d*x + c) + 1) + 3*log(sin(d*x + c) - 1)) - 16*b/
cos(d*x + c)^5)/d
```

mupad [B] time = 7.07, size = 175, normalized size = 2.36

$$\frac{3\,a\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{4\,d}-\frac{-\frac{5\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9}{4}+2\,b\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8+\frac{a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7}{2}+4\,b\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-\frac{a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3}{2}+\cdots}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}-5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8+10\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6-10\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+5\tan\left(\cdots\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))/cos(c + d*x)^5,x)
```

```
[Out] (3*a*atanh(tan(c/2 + (d*x)/2)))/(4*d) - ((2*b)/5 + (5*a*tan(c/2 + (d*x)/2))
/4 - (a*tan(c/2 + (d*x)/2)^3)/2 + (a*tan(c/2 + (d*x)/2)^7)/2 - (5*a*tan(c/2
 + (d*x)/2)^9)/4 + 4*b*tan(c/2 + (d*x)/2)^4 + 2*b*tan(c/2 + (d*x)/2)^8)/(d*
(5*tan(c/2 + (d*x)/2)^2 - 10*tan(c/2 + (d*x)/2)^4 + 10*tan(c/2 + (d*x)/2)^6
 - 5*tan(c/2 + (d*x)/2)^8 + tan(c/2 + (d*x)/2)^10 - 1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a + b\tan(c + dx))\sec^5(c + dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**5*(a+b*tan(d*x+c)),x)
```

```
[Out] Integral((a + b*tan(c + d*x))*sec(c + d*x)**5, x)
```

3.509 $\int \sec^4(c+dx)(a+b\tan(c+dx))\,dx$

Optimal. Leaf size=44

$$\frac{a\tan^3(c+dx)}{3d}+\frac{a\tan(c+dx)}{d}+\frac{b\sec^4(c+dx)}{4d}$$

```
[Out] 1/4*b*sec(d*x+c)^4/d+a*tan(d*x+c)/d+1/3*a*tan(d*x+c)^3/d
```

Rubi [A] time = 0.03, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {3486, 3767}

$$\frac{a\tan^3(c+dx)}{3d}+\frac{a\tan(c+dx)}{d}+\frac{b\sec^4(c+dx)}{4d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4*(a + b*Tan[c + d*x]),x]
```

```
[Out] (b*Sec[c + d*x]^4)/(4*d) + (a*Tan[c + d*x])/d + (a*Tan[c + d*x]^3)/(3*d)
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3767

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rubi steps

$$\begin{aligned}\int \sec^4(c+dx)(a+b\tan(c+dx))\,dx &= \frac{b\sec^4(c+dx)}{4d}+a\int \sec^4(c+dx)\,dx\\ &= \frac{b\sec^4(c+dx)}{4d}-\frac{a\,\text{Subst}\left(\int \left(1+x^2\right)\,dx,x,-\tan(c+dx)\right)}{d}\\ &= \frac{b\sec^4(c+dx)}{4d}+\frac{a\tan(c+dx)}{d}+\frac{a\tan^3(c+dx)}{3d}\end{aligned}$$

Mathematica [A] time = 0.09, size = 41, normalized size = 0.93

$$\frac{a\left(\frac{1}{3}\tan^3(c+dx)+\tan(c+dx)\right)}{d}+\frac{b\sec^4(c+dx)}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4*(a + b*Tan[c + d*x]),x]
```

```
[Out] (b*Sec[c + d*x]^4)/(4*d) + (a*(Tan[c + d*x] + Tan[c + d*x]^3/3))/d
```

fricas [A] time = 0.70, size = 45, normalized size = 1.02

$$\frac{4\left(2\,a\cos\left(dx+c\right)^3+a\cos\left(dx+c\right)\right)\sin\left(dx+c\right)+3\,b}{12\,d\cos\left(dx+c\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+b*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/12*(4*(2*a*cos(d*x + c)^3 + a*cos(d*x + c))*sin(d*x + c) + 3*b)/(d*cos(d*
x + c)^4)
```

giac [A] time = 0.60, size = 48, normalized size = 1.09

$$\frac{3\,b\tan\left(dx+c\right)^{4}+4\,a\tan\left(dx+c\right)^{3}+6\,b\tan\left(dx+c\right)^{2}+12\,a\tan\left(dx+c\right)}{12\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+b*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/12*(3*b*tan(d*x + c)^4 + 4*a*tan(d*x + c)^3 + 6*b*tan(d*x + c)^2 + 12*a*t
an(d*x + c))/d
```

maple [A] time = 0.36, size = 38, normalized size = 0.86

$$\frac{-a\left(-\frac{2}{3}-\frac{\left(\sec^{2}(dx+c)\right)}{3}\right)\tan\left(dx+c\right)+\frac{b}{4\cos(dx+c)^{4}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4*(a+b*tan(d*x+c)),x)
```

```
[Out] 1/d*(-a*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c)+1/4*b/cos(d*x+c)^4)
```

maxima [A] time = 0.33, size = 48, normalized size = 1.09

$$\frac{3\,b\tan\left(dx+c\right)^{4}+4\,a\tan\left(dx+c\right)^{3}+6\,b\tan\left(dx+c\right)^{2}+12\,a\tan\left(dx+c\right)}{12\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+b*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/12*(3*b*tan(d*x + c)^4 + 4*a*tan(d*x + c)^3 + 6*b*tan(d*x + c)^2 + 12*a*t
an(d*x + c))/d
```

mupad [B] time = 3.59, size = 46, normalized size = 1.05

$$\frac{\frac{b\tan(c+d\,x)^{4}}{4}+\frac{a\tan(c+d\,x)^{3}}{3}+\frac{b\tan(c+d\,x)^{2}}{2}+a\tan\left(c+d\,x\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))/cos(c + d*x)^4,x)
```

```
[Out] (a*tan(c + d*x) + (a*tan(c + d*x)^3)/3 + (b*tan(c + d*x)^2)/2 + (b*tan(c +
d*x)^4)/4)/d
```

sympy [A] time = 3.11, size = 44, normalized size = 1.00

$$\begin{cases}\frac{a\left(\frac{\tan^{3}(c+dx)}{3}+\tan(c+dx)\right)+\frac{b\sec^{4}(c+dx)}{4}}{d} & \text{for}\; d\neq 0\\ x\left(a+b\tan\left(c\right)\right)\sec^{4}\left(c\right) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4*(a+b*tan(d*x+c)),x)
```

```
[Out] Piecewise(((a*(tan(c + d*x)**3/3 + tan(c + d*x)) + b*sec(c + d*x)**4/4)/d,
Ne(d, 0)), (x*(a + b*tan(c))*sec(c)**4, True))
```

3.510 $\int \sec^3(c+dx)(a+b\tan(c+dx))\,dx$

Optimal. Leaf size=52

$$\frac{a\tanh^{-1}(\sin(c+dx))}{2d}+\frac{a\tan(c+dx)\sec(c+dx)}{2d}+\frac{b\sec^3(c+dx)}{3d}$$

```
[Out] 1/2*a*arctanh(sin(d*x+c))/d+1/3*b*sec(d*x+c)^3/d+1/2*a*sec(d*x+c)*tan(d*x+c
)/d
```

Rubi [A] time = 0.03, antiderivative size = 52, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {3486, 3768, 3770}

$$\frac{a\tanh^{-1}(\sin(c+dx))}{2d}+\frac{a\tan(c+dx)\sec(c+dx)}{2d}+\frac{b\sec^3(c+dx)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3*(a + b*Tan[c + d*x]),x]
```

```
[Out] (a*ArcTanh[Sin[c + d*x]])/(2*d) + (b*Sec[c + d*x]^3)/(3*d) + (a*Sec[c + d*x
]*Tan[c + d*x])/(2*d)
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\int \sec^3(c+dx)(a+b\tan(c+dx))\,dx &= \frac{b\sec^3(c+dx)}{3d}+a\int \sec^3(c+dx)\,dx\\ &= \frac{b\sec^3(c+dx)}{3d}+\frac{a\sec(c+dx)\tan(c+dx)}{2d}+\frac{1}{2}a\int \sec(c+dx)\,dx\\ &= \frac{a\tanh^{-1}(\sin(c+dx))}{2d}+\frac{b\sec^3(c+dx)}{3d}+\frac{a\sec(c+dx)\tan(c+dx)}{2d}\end{aligned}$$

Mathematica [A] time = 0.02, size = 52, normalized size = 1.00

$$\frac{a\tanh^{-1}(\sin(c+dx))}{2d}+\frac{a\tan(c+dx)\sec(c+dx)}{2d}+\frac{b\sec^3(c+dx)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^3*(a + b*Tan[c + d*x]),x]
```

```
[Out] (a*ArcTanh[Sin[c + d*x]])/(2*d) + (b*Sec[c + d*x]^3)/(3*d) + (a*Sec[c + d*x
]*Tan[c + d*x])/(2*d)
```

fricas [A] time = 0.70, size = 74, normalized size = 1.42

$$\frac{3\,a\cos\left(dx+c\right)^{3}\log\left(\sin\left(dx+c\right)+1\right)-3\,a\cos\left(dx+c\right)^{3}\log\left(-\sin\left(dx+c\right)+1\right)+6\,a\cos\left(dx+c\right)\sin\left(dx+c\right)}{12\,d\cos\left(dx+c\right)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+b*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/12*(3*a*cos(d*x + c)^3*log(sin(d*x + c) + 1) - 3*a*cos(d*x + c)^3*log(-si
n(d*x + c) + 1) + 6*a*cos(d*x + c)*sin(d*x + c) + 4*b)/(d*cos(d*x + c)^3)
```

giac [B] time = 0.58, size = 99, normalized size = 1.90

$$\frac{3\,a\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-3\,a\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)+\frac{2\left(3\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{5}-6\,b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{4}-3\,a\tan\left(\frac{1}{2}\,dx+\right.}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{2}-1\right)^{3}}}{6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+b*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/6*(3*a*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 3*a*log(abs(tan(1/2*d*x + 1/2
*c) - 1)) + 2*(3*a*tan(1/2*d*x + 1/2*c)^5 - 6*b*tan(1/2*d*x + 1/2*c)^4 - 3*
a*tan(1/2*d*x + 1/2*c) - 2*b)/(tan(1/2*d*x + 1/2*c)^2 - 1)^3)/d
```

maple [A] time = 0.38, size = 54, normalized size = 1.04

$$\frac{a\sec\left(dx+c\right)\tan\left(dx+c\right)}{2d}+\frac{a\ln\left(\sec\left(dx+c\right)+\tan\left(dx+c\right)\right)}{2d}+\frac{b}{3d\cos\left(dx+c\right)^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3*(a+b*tan(d*x+c)),x)
```

```
[Out] 1/2*a*sec(d*x+c)*tan(d*x+c)/d+1/2/d*a*ln(sec(d*x+c)+tan(d*x+c))+1/3/d*b/cos
(d*x+c)^3
```

maxima [A] time = 0.34, size = 61, normalized size = 1.17

$$-\frac{3\,a\left(\frac{2\,\sin\left(dx+c\right)}{\sin\left(dx+c\right)^{2}-1}-\log\left(\sin\left(dx+c\right)+1\right)+\log\left(\sin\left(dx+c\right)-1\right)\right)-\frac{4\,b}{\cos\left(dx+c\right)^{3}}}{12\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+b*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/12*(3*a*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) - log(sin(d*x + c) + 1) + l
og(sin(d*x + c) - 1)) - 4*b/cos(d*x + c)^3)/d
```

mupad [B] time = 5.41, size = 105, normalized size = 2.02

$$\frac{a\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d}-\frac{-a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{5}+2\,b\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{4}+a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+\frac{2\,b}{3}}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{6}-3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{4}+3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{2}-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))/cos(c + d*x)^3,x)
```

```
[Out] (a*atanh(tan(c/2 + (d*x)/2)))/d - ((2*b)/3 + a*tan(c/2 + (d*x)/2) - a*tan(c
/2 + (d*x)/2)^5 + 2*b*tan(c/2 + (d*x)/2)^4)/(d*(3*tan(c/2 + (d*x)/2)^2 - 3*
tan(c/2 + (d*x)/2)^4 + tan(c/2 + (d*x)/2)^6 - 1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a + b\tan (c + dx)) \sec^3 (c + dx)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3*(a+b*tan(d*x+c)),x)
```

```
[Out] Integral((a + b*tan(c + d*x))*sec(c + d*x)**3, x)
```

3.511 $\int \sec^2(c+dx)(a+b\tan(c+dx))\,dx$

Optimal. Leaf size=28

$$\frac{a\tan(c+dx)}{d}+\frac{b\sec^2(c+dx)}{2d}$$

```
[Out] 1/2*b*sec(d*x+c)^2/d+a*tan(d*x+c)/d
```

Rubi [A] time = 0.03, antiderivative size = 28, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {3486, 3767, 8}

$$\frac{a\tan(c+dx)}{d}+\frac{b\sec^2(c+dx)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2*(a + b*Tan[c + d*x]),x]
```

```
[Out] (b*Sec[c + d*x]^2)/(2*d) + (a*Tan[c + d*x])/d
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3767

```
Int[csc[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
ndIntegrand[(1 + x^2)^(n/2 - 1), x], x], x, Cot[c + d*x]], x] /; FreeQ[{c,
d}, x] && IGtQ[n/2, 0]
```

Rubi steps

$$\begin{aligned}\int \sec^2(c+dx)(a+b\tan(c+dx))\,dx &= \frac{b\sec^2(c+dx)}{2d}+a\int \sec^2(c+dx)\,dx\\ &= \frac{b\sec^2(c+dx)}{2d}-\frac{a\,\text{Subst}\left(\int 1\,dx,x,-\tan(c+dx)\right)}{d}\\ &= \frac{b\sec^2(c+dx)}{2d}+\frac{a\tan(c+dx)}{d}\end{aligned}$$

Mathematica [A] time = 0.01, size = 28, normalized size = 1.00

$$\frac{a\tan(c+dx)}{d}+\frac{b\sec^2(c+dx)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2*(a + b*Tan[c + d*x]),x]
```

```
[Out] (b*Sec[c + d*x]^2)/(2*d) + (a*Tan[c + d*x])/d
```

fricas [A] time = 0.79, size = 30, normalized size = 1.07

$$\frac{2\,a\cos\left(dx+c\right)\sin\left(dx+c\right)+b}{2\,d\cos\left(dx+c\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+b*tan(d*x+c)),x, algorithm="fricas")
[Out] 1/2*(2*a*cos(d*x + c)*sin(d*x + c) + b)/(d*cos(d*x + c)^2)
```

giac [A] time = 0.28, size = 25, normalized size = 0.89

$$\frac{b\tan\left(dx+c\right)^{2}+2\,a\tan\left(dx+c\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+b*tan(d*x+c)),x, algorithm="giac")
[Out] 1/2*(b*tan(d*x + c)^2 + 2*a*tan(d*x + c))/d
```

maple [A] time = 0.36, size = 25, normalized size = 0.89

$$\frac{a\tan\left(dx+c\right)+\frac{b}{2\cos(dx+c)^{2}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2*(a+b*tan(d*x+c)),x)
[Out] 1/d*(a*tan(d*x+c)+1/2*b/cos(d*x+c)^2)
```

maxima [A] time = 0.33, size = 20, normalized size = 0.71

$$\frac{\left(b\tan\left(dx+c\right)+a\right)^{2}}{2\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+b*tan(d*x+c)),x, algorithm="maxima")
[Out] 1/2*(b*tan(d*x + c) + a)^2/(b*d)
```

mupad [B] time = 3.69, size = 23, normalized size = 0.82

$$\frac{\tan\left(c+d\,x\right)\,\left(2\,a+b\tan\left(c+d\,x\right)\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))/cos(c + d*x)^2,x)
[Out] (tan(c + d*x)*(2*a + b*tan(c + d*x)))/(2*d)
```

sympy [A] time = 2.30, size = 34, normalized size = 1.21

$$\begin{cases} \frac{a\tan\left(c+dx\right)+\frac{b\tan^{2}\left(c+dx\right)}{2}}{d} & \text{for}\ d\neq 0 \\ x\left(a+b\tan\left(c\right)\right)\sec^{2}\left(c\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2*(a+b*tan(d*x+c)),x)
[Out] Piecewise(((a*tan(c + d*x) + b*tan(c + d*x)**2/2)/d, Ne(d, 0)), (x*(a + b*t
an(c))*sec(c)**2, True))
```

3.512 $\int \sec(c+dx)(a+b\tan(c+dx))\,dx$

Optimal. Leaf size=24

$$\frac{a\tanh^{-1}(\sin(c+dx))}{d}+\frac{b\sec(c+dx)}{d}$$

```
[Out] a*arctanh(sin(d*x+c))/d+b*sec(d*x+c)/d
```

Rubi [A] time = 0.02, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {3486, 3770}

$$\frac{a\tanh^{-1}(\sin(c+dx))}{d}+\frac{b\sec(c+dx)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]*(a + b*Tan[c + d*x]),x]
[Out] (a*ArcTanh[Sin[c + d*x]])/d + (b*Sec[c + d*x])/d
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\int \sec(c+dx)(a+b\tan(c+dx))\,dx &= \frac{b\sec(c+dx)}{d}+a\int \sec(c+dx)\,dx\\ &= \frac{a\tanh^{-1}(\sin(c+dx))}{d}+\frac{b\sec(c+dx)}{d}\end{aligned}$$

Mathematica [A] time = 0.01, size = 24, normalized size = 1.00

$$\frac{a\tanh^{-1}(\sin(c+dx))}{d}+\frac{b\sec(c+dx)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]*(a + b*Tan[c + d*x]),x]
[Out] (a*ArcTanh[Sin[c + d*x]])/d + (b*Sec[c + d*x])/d
```

fricas [B] time = 1.80, size = 54, normalized size = 2.25

$$\frac{a\cos\left(dx+c\right)\log\left(\sin\left(dx+c\right)+1\right)-a\cos\left(dx+c\right)\log\left(-\sin\left(dx+c\right)+1\right)+2\,b}{2\,d\cos\left(dx+c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+b*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/2*(a*cos(d*x + c)*log(sin(d*x + c) + 1) - a*cos(d*x + c)*log(-sin(d*x + c
) + 1) + 2*b)/(d*cos(d*x + c))
```

giac [B] time = 0.29, size = 54, normalized size = 2.25

$$\frac{a\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-a\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)-\frac{2\,b}{\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{2}-1}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+b*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] (a*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - a*log(abs(tan(1/2*d*x + 1/2*c) - 1)
) - 2*b/(tan(1/2*d*x + 1/2*c)^2 - 1))/d
```

maple [A] time = 0.09, size = 34, normalized size = 1.42

$$\frac{a\ln\left(\sec\left(dx+c\right)+\tan\left(dx+c\right)\right)}{d}+\frac{b}{d\cos\left(dx+c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)*(a+b*tan(d*x+c)),x)
```

```
[Out] 1/d*a*ln(sec(d*x+c)+tan(d*x+c))+1/d*b/cos(d*x+c)
```

maxima [A] time = 0.33, size = 31, normalized size = 1.29

$$\frac{a\log\left(\sec\left(dx+c\right)+\tan\left(dx+c\right)\right)+\frac{b}{\cos(dx+c)}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+b*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] (a*log(sec(d*x + c) + tan(d*x + c)) + b/cos(d*x + c))/d
```

mupad [B] time = 3.75, size = 38, normalized size = 1.58

$$\frac{2\,a\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d}-\frac{2\,b}{d\,\left({\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^2-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))/cos(c + d*x),x)
```

```
[Out] (2*a*atanh(tan(c/2 + (d*x)/2)))/d - (2*b)/(d*(tan(c/2 + (d*x)/2)^2 - 1))
```

sympy [A] time = 4.52, size = 37, normalized size = 1.54

$$\begin{cases} \frac{a\log\left(\tan\left(c+dx\right)+\sec\left(c+dx\right)\right)+b\sec\left(c+dx\right)}{d} & \text{for}\: d \neq 0 \\ x\left(a+b\tan\left(c\right)\right)\sec\left(c\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+b*tan(d*x+c)),x)
```

```
[Out] Piecewise(((a*log(tan(c + d*x) + sec(c + d*x)) + b*sec(c + d*x))/d, Ne(d, 0
)), (x*(a + b*tan(c))*sec(c), True))
```

3.513 $\int \cos(c+dx)(a+b\tan(c+dx))\,dx$

Optimal. Leaf size=24

$$\frac{a\sin(c+dx)}{d}-\frac{b\cos(c+dx)}{d}$$

```
[Out] -b*cos(d*x+c)/d+a*sin(d*x+c)/d
```

Rubi [A] time = 0.02, antiderivative size = 24, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {3486, 2637}

$$\frac{a\sin(c+dx)}{d}-\frac{b\cos(c+dx)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]*(a + b*Tan[c + d*x]),x]
```

```
[Out] -((b*Cos[c + d*x])/d) + (a*Sin[c + d*x])/d
```

Rule 2637

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rubi steps

$$\begin{aligned}\int \cos(c+dx)(a+b\tan(c+dx))\,dx &= -\frac{b\cos(c+dx)}{d}+a\int \cos(c+dx)\,dx\\ &= -\frac{b\cos(c+dx)}{d}+\frac{a\sin(c+dx)}{d}\end{aligned}$$

Mathematica [A] time = 0.02, size = 46, normalized size = 1.92

$$\frac{a\sin(c)\cos(dx)}{d}+\frac{a\cos(c)\sin(dx)}{d}+\frac{b\sin(c)\sin(dx)}{d}-\frac{b\cos(c)\cos(dx)}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]*(a + b*Tan[c + d*x]),x]
```

```
[Out] -((b*Cos[c]*Cos[d*x])/d) + (a*Cos[d*x]*Sin[c])/d + (a*Cos[c]*Sin[d*x])/d +
(b*Sin[c]*Sin[d*x])/d
```

fricas [A] time = 0.68, size = 23, normalized size = 0.96

$$-\frac{b\cos(dx+c)-a\sin(dx+c)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+b*tan(d*x+c)),x, algorithm="fricas")
```

[Out] -(b*cos(d*x + c) - a*sin(d*x + c))/d

giac [B] time = 0.21, size = 129, normalized size = 5.38

$$-\frac{b\tan\left(\frac{1}{2}\,dx\right)^{2}\tan\left(\frac{1}{2}\,c\right)^{2}+2\,a\tan\left(\frac{1}{2}\,dx\right)^{2}\tan\left(\frac{1}{2}\,c\right)+2\,a\tan\left(\frac{1}{2}\,dx\right)\tan\left(\frac{1}{2}\,c\right)^{2}-b\tan\left(\frac{1}{2}\,dx\right)^{2}-4\,b\tan\left(\frac{1}{2}\,dx\right)\tan}{d\tan\left(\frac{1}{2}\,dx\right)^{2}\tan\left(\frac{1}{2}\,c\right)^{2}+d\tan\left(\frac{1}{2}\,dx\right)^{2}+d\tan\left(\frac{1}{2}\,c\right)^{2}+}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(cos(d*x+c)*(a+b*tan(d*x+c)),x, algorithm="giac")

[Out] -(b*tan(1/2*d*x)^2*tan(1/2*c)^2 + 2*a*tan(1/2*d*x)^2*tan(1/2*c) + 2*a*tan(1/2*d*x)*tan(1/2*c)^2 - b*tan(1/2*d*x)^2 - 4*b*tan(1/2*d*x)*tan(1/2*c) - b*tan(1/2*c)^2 - 2*a*tan(1/2*d*x) - 2*a*tan(1/2*c) + b)/(d*tan(1/2*d*x)^2*tan(1/2*c)^2 + d*tan(1/2*d*x)^2 + d*tan(1/2*c)^2 + d)

maple [A] time = 0.24, size = 23, normalized size = 0.96

$$\frac{a\sin\left(dx+c\right)-b\cos\left(dx+c\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(cos(d*x+c)*(a+b*tan(d*x+c)),x)

[Out] 1/d*(a*sin(d*x+c)-b*cos(d*x+c))

maxima [A] time = 0.33, size = 23, normalized size = 0.96

$$-\frac{b\cos\left(dx+c\right)-a\sin\left(dx+c\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(cos(d*x+c)*(a+b*tan(d*x+c)),x, algorithm="maxima")

[Out] -(b*cos(d*x + c) - a*sin(d*x + c))/d

mupad [B] time = 3.72, size = 38, normalized size = 1.58

$$-\frac{2\,\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(b\,\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)-a\,\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(cos(c + d*x)*(a + b*tan(c + d*x)),x)

[Out] -(2*cos(c/2 + (d*x)/2)*(b*cos(c/2 + (d*x)/2) - a*sin(c/2 + (d*x)/2)))/d

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(a+b\tan\left(c+dx\right)\right)\cos\left(c+dx\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(cos(d*x+c)*(a+b*tan(d*x+c)),x)

[Out] Integral((a + b*tan(c + d*x))*cos(c + d*x), x)

3.514 $\int \cos^2(c+dx)(a+b\tan(c+dx))\,dx$

Optimal. Leaf size=43

$$\frac{a\sin(c+dx)\cos(c+dx)}{2d}+\frac{ax}{2}-\frac{b\cos^2(c+dx)}{2d}$$

```
[Out] 1/2*a*x-1/2*b*cos(d*x+c)^2/d+1/2*a*cos(d*x+c)*sin(d*x+c)/d
```

Rubi [A] time = 0.03, antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {3486, 2635, 8}

$$\frac{a\sin(c+dx)\cos(c+dx)}{2d}+\frac{ax}{2}-\frac{b\cos^2(c+dx)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2*(a + b*Tan[c + d*x]),x]
```

```
[Out] (a*x)/2 - (b*Cos[c + d*x]^2)/(2*d) + (a*Cos[c + d*x]*Sin[c + d*x])/(2*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2635

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Sin[c + d*x])^(n - 1))/(d*n), x] + Dist[(b^2*(n - 1))/n, Int[(b*Sin[c
+ d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2*n
]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rubi steps

$$\begin{aligned}\int \cos^2(c+dx)(a+b\tan(c+dx))\,dx &= -\frac{b\cos^2(c+dx)}{2d}+a\int \cos^2(c+dx)\,dx\\ &= -\frac{b\cos^2(c+dx)}{2d}+\frac{a\cos(c+dx)\sin(c+dx)}{2d}+\frac{1}{2}a\int 1\,dx\\ &= \frac{ax}{2}-\frac{b\cos^2(c+dx)}{2d}+\frac{a\cos(c+dx)\sin(c+dx)}{2d}\end{aligned}$$

Mathematica [A] time = 0.05, size = 46, normalized size = 1.07

$$\frac{a(c+dx)}{2d}+\frac{a\sin(2(c+dx))}{4d}-\frac{b\cos^2(c+dx)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2*(a + b*Tan[c + d*x]),x]
```

[Out] (a*(c + d*x))/(2*d) - (b*Cos[c + d*x]^2)/(2*d) + (a*Sin[2*(c + d*x)])/(4*d)

fricas [A] time = 0.66, size = 35, normalized size = 0.81

$$\frac{adx - b\cos(dx+c)^2 + a\cos(dx+c)\sin(dx+c)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(cos(d*x+c)^2*(a+b*tan(d*x+c)),x, algorithm="fricas")

[Out] 1/2*(a*d*x - b*cos(d*x + c)^2 + a*cos(d*x + c)*sin(d*x + c))/d

giac [B] time = 1.72, size = 146, normalized size = 3.40

$$\frac{2\,adx\tan(dx)^2\tan(c)^2 + 2\,adx\tan(dx)^2 + 2\,adx\tan(c)^2 - b\tan(dx)^2\tan(c)^2 - 2\,a\tan(dx)^2\tan(c) - 2\,a\tan(dx)}{4\left(d\tan(dx)^2\tan(c)^2 + d\tan(dx)^2 +\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(cos(d*x+c)^2*(a+b*tan(d*x+c)),x, algorithm="giac")

[Out] 1/4*(2*a*d*x*tan(d*x)^2*tan(c)^2 + 2*a*d*x*tan(d*x)^2 + 2*a*d*x*tan(c)^2 - b*tan(d*x)^2*tan(c)^2 - 2*a*tan(d*x)^2*tan(c) - 2*a*tan(d*x)*tan(c)^2 + 2*a *d*x + b*tan(d*x)^2 + 4*b*tan(d*x)*tan(c) + b*tan(c)^2 + 2*a*tan(d*x) + 2*a *tan(c) - b)/(d*tan(d*x)^2*tan(c)^2 + d*tan(d*x)^2 + d*tan(c)^2 + d)

maple [A] time = 0.29, size = 41, normalized size = 0.95

$$\frac{-\frac{\left(\cos^2(dx+c)\right)b}{2} + a\left(\frac{\cos(dx+c)\sin(dx+c)}{2} + \frac{dx}{2} + \frac{c}{2}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(cos(d*x+c)^2*(a+b*tan(d*x+c)),x)

[Out] 1/d*(-1/2*cos(d*x+c)^2*b+a*(1/2*cos(d*x+c)*sin(d*x+c)+1/2*d*x+1/2*c))

maxima [A] time = 0.43, size = 38, normalized size = 0.88

$$\frac{(dx+c)a + \frac{a\tan(dx+c)-b}{\tan(dx+c)^2+1}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(cos(d*x+c)^2*(a+b*tan(d*x+c)),x, algorithm="maxima")

[Out] 1/2*((d*x + c)*a + (a*tan(d*x + c) - b)/(tan(d*x + c)^2 + 1))/d

mupad [B] time = 3.68, size = 31, normalized size = 0.72

$$\frac{a\,x}{2} - \frac{\cos(c+d\,x)^2\,\left(\frac{b}{2} - \frac{a\tan(c+d\,x)}{2}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(cos(c + d*x)^2*(a + b*tan(c + d*x)),x)

[Out] (a*x)/2 - (cos(c + d*x)^2*(b/2 - (a*tan(c + d*x))/2))/d

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a + b\tan(c+dx))\cos^2(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2*(a+b*tan(d*x+c)),x)
```

```
[Out] Integral((a + b*tan(c + d*x))*cos(c + d*x)**2, x)
```

3.515 $\int \cos^3(c+dx)(a+b\tan(c+dx))\,dx$

Optimal. Leaf size=44

$$-\frac{a\sin^3(c+dx)}{3d}+\frac{a\sin(c+dx)}{d}-\frac{b\cos^3(c+dx)}{3d}$$

```
[Out] -1/3*b*cos(d*x+c)^3/d+a*sin(d*x+c)/d-1/3*a*sin(d*x+c)^3/d
```

Rubi [A] time = 0.03, antiderivative size = 44, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {3486, 2633}

$$-\frac{a\sin^3(c+dx)}{3d}+\frac{a\sin(c+dx)}{d}-\frac{b\cos^3(c+dx)}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3*(a + b*Tan[c + d*x]),x]
```

```
[Out] -(b*Cos[c + d*x]^3)/(3*d) + (a*Sin[c + d*x])/d - (a*Sin[c + d*x]^3)/(3*d)
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rubi steps

$$\begin{aligned}\int \cos^3(c+dx)(a+b\tan(c+dx))\,dx &= -\frac{b\cos^3(c+dx)}{3d}+a\int \cos^3(c+dx)\,dx\\ &= -\frac{b\cos^3(c+dx)}{3d}-\frac{a\,\text{Subst}\left(\int \left(1-x^2\right)\,dx,x,-\sin(c+dx)\right)}{d}\\ &= -\frac{b\cos^3(c+dx)}{3d}+\frac{a\sin(c+dx)}{d}-\frac{a\sin^3(c+dx)}{3d}\end{aligned}$$

Mathematica [A] time = 0.01, size = 44, normalized size = 1.00

$$-\frac{a\sin^3(c+dx)}{3d}+\frac{a\sin(c+dx)}{d}-\frac{b\cos^3(c+dx)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3*(a + b*Tan[c + d*x]),x]
```

```
[Out] -1/3*(b*Cos[c + d*x]^3)/d + (a*Sin[c + d*x])/d - (a*Sin[c + d*x]^3)/(3*d)
```

fricas [A] time = 0.66, size = 38, normalized size = 0.86

$$-\frac{b\cos\left(dx+c\right)^3-\left(a\cos\left(dx+c\right)^2+2\,a\right)\sin\left(dx+c\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+b*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] -1/3*(b*cos(d*x + c)^3 - (a*cos(d*x + c)^2 + 2*a)*sin(d*x + c))/d
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+b*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError >> Unable to parse Giac output: Unabl
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able to check sign: (4*pi/x/2)>(-4*pi/x/2)Unable to check sign: (4*pi/x/2)>
(-4*pi/x/2)Unable to check sign: (4*pi/x/2)>(-4*pi/x/2)Unable to check sign
: (4*pi/x/2)>(-4*pi/x/2)Unable to check sign: (4*pi/x/2)>(-4*pi/x/2)Unable
to check sign: (4*pi/x/2)>(-4*pi/x/2)Unable to check sign: (4*pi/x/2)>(-4*p
i/x/2)Unable to check sign: (4*pi/x/2)>(-4*pi/x/2)Unable to check sign: (4*
pi/x/2)>(-4*pi/x/2)Unable to check sign: (4*pi/x/2)>(-4*pi/x/2)Unable to ch
eck sign: (4*pi/x/2)>(-4*pi/x/2)Unable to check sign: (4*pi/x/2)>(-4*pi/x/2
)Unable to check sign: (4*pi/x/2)>(-4*pi/x/2)Unable to check sign: (4*pi/x/
2)>(-4*pi/x/2)Unable to check sign: (4*pi/x/2)>(-4*pi/x/2)Unable to check s
ign: (4*pi/x/2)>(-4*pi/x/2)Unable to check sign: (4*pi/x/2)>(-4*pi/x/2)Unab
le to check sign: (4*pi/x/2)>(-4*pi/x/2)Unable to check sign: (4*pi/x/2)>(-
4*pi/x/2)Unable to check sign: (4*pi/x/2)>(-4*pi/x/2)Unable to check sign:
(4*pi/x/2)>(-4*pi/x/2)Unable to check sign: (4*pi/x/2)>(-4*pi/x/2)Unable to
 check sign: (4*pi/x/2)>(-4*pi/x/2)Unable to check sign: (4*pi/x/2)>(-4*pi/
x/2)Unable to check sign: (4*pi/x/2)>(-4*pi/x/2)(-192*a*tan(c/2)^6*tan(d*x/
2)^5-128*a*tan(c/2)^6*tan(d*x/2)^3-192*a*tan(c/2)^6*tan(d*x/2)-192*a*tan(c/
2)^5*tan(d*x/2)^6+576*a*tan(c/2)^5*tan(d*x/2)^4-576*a*tan(c/2)^5*tan(d*x/2)
^2+192*a*tan(c/2)^5+576*a*tan(c/2)^4*tan(d*x/2)^5-2688*a*tan(c/2)^4*tan(d*x
/2)^3+576*a*tan(c/2)^4*tan(d*x/2)-128*a*tan(c/2)^3*tan(d*x/2)^6-2688*a*tan(
c/2)^3*tan(d*x/2)^4+2688*a*tan(c/2)^3*tan(d*x/2)^2+128*a*tan(c/2)^3-576*a*t
an(c/2)^2*tan(d*x/2)^5+2688*a*tan(c/2)^2*tan(d*x/2)^3-576*a*tan(c/2)^2*tan(
d*x/2)-192*a*tan(c/2)*tan(d*x/2)^6+576*a*tan(c/2)*tan(d*x/2)^4-576*a*tan(c/
2)*tan(d*x/2)^2+192*a*tan(c/2)+192*a*tan(d*x/2)^5+128*a*tan(d*x/2)^3+192*a*
tan(d*x/2)+3*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(
c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2
+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^6
+9*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan
(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2
)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^4+9*b*pi*si
gn(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+
2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/
2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^2+3*b*pi*sign(tan(c/2
)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/
2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan
(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6+9*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(
c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*t
an(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*t
an(c/2)^4*tan(d*x/2)^6+27*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*ta
n(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)
^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4
*tan(d*x/2)^4+27*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+
tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/
2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/
2)^2+9*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2
-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan
(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4+9*b*pi*sign(tan(c/
2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x
/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*ta
n(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^6+27*b*pi*sign(tan(c/2)^2*tan(
d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*si
gn(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+ta
n(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^4+27*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+
2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/
2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^
```

2-1)*tan(c/2)^2*tan(d*x/2)^2+9*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)
^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d
*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c
/2)^2+3*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^
2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*ta
n(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^6+9*b*pi*sign(tan
(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(
d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2
*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^4+9*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+
2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/
2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^
2-1)*tan(d*x/2)^2+3*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/
2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan
(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)-3*b*pi*sign(tan(
c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d
*x/2)-1)*tan(c/2)^6*tan(d*x/2)^6-9*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(
c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*tan(c/2)^6*tan(d*
x/2)^4-9*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)
^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*tan(c/2)^6*tan(d*x/2)^2-3*b*pi*sign(tan(c/2
)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/
2)-1)*tan(c/2)^6-9*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2
)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*tan(c/2)^4*tan(d*x/2)^6-27*b*pi*s
ign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2
+2*tan(d*x/2)-1)*tan(c/2)^4*tan(d*x/2)^4-27*b*pi*sign(tan(c/2)^2*tan(d*x/2)
^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*tan(c/2)
^4*tan(d*x/2)^2-9*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)
+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*tan(c/2)^4-9*b*pi*sign(tan(c/2)^2*
tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1
)*tan(c/2)^2*tan(d*x/2)^6-27*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2
*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*tan(c/2)^2*tan(d*x/2)^4
-27*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-ta
n(d*x/2)^2+2*tan(d*x/2)-1)*tan(c/2)^2*tan(d*x/2)^2-9*b*pi*sign(tan(c/2)^2*t
an(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)
*tan(c/2)^2-3*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan
(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*tan(d*x/2)^6-9*b*pi*sign(tan(c/2)^2*ta
n(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*
tan(d*x/2)^4-9*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+ta
n(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*tan(d*x/2)^2-3*b*pi*sign(tan(c/2)^2*t
an(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)
+3*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan
(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2
)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^6+9*b*pi*si
gn(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-
2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/
2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^4+9*b*pi*sign(tan(c/2
)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/
2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan
(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^2+3*b*pi*sign(tan(c/2)^2*tan(d*
x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign
(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(
d*x/2)^2-1)*tan(c/2)^6+9*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan
(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^
2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*
tan(d*x/2)^6+27*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+t
an(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2
)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2
)^4+27*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2
-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan
(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)^2+9*b*p

```
i*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2
)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(
d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4+9*b*pi*sign(tan(c/2)^2*tan(d
*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sig
n(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan
(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^6+27*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2
*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2
)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2
-1)*tan(c/2)^2*tan(d*x/2)^4+27*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)
^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d
*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c
/2)^2*tan(d*x/2)^2+9*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x
/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-ta
n(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2+3*b*
pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/
2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan
(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^6+9*b*pi*sign(tan(c/2)^2*ta
n(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*
sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+
tan(d*x/2)^2-1)*tan(d*x/2)^4+9*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)
^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d
*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(d
*x/2)^2+3*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2
)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*
tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)+3*b*pi*sign(tan(c/2)^2*tan
(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*t
an(c/2)^6*tan(d*x/2)^6+9*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan
(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*tan(c/2)^6*tan(d*x/2)^4+9*b
*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x
/2)^2-2*tan(d*x/2)-1)*tan(c/2)^6*tan(d*x/2)^2+3*b*pi*sign(tan(c/2)^2*tan(d*
x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*tan(
c/2)^6+9*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)
^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*tan(c/2)^4*tan(d*x/2)^6+27*b*pi*sign(tan(c/
2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x
/2)-1)*tan(c/2)^4*tan(d*x/2)^4+27*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c
/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*tan(c/2)^4*tan(d*x
/2)^2+9*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^
2-tan(d*x/2)^2-2*tan(d*x/2)-1)*tan(c/2)^4+9*b*pi*sign(tan(c/2)^2*tan(d*x/2)
^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*tan(c/2)
^2*tan(d*x/2)^6+27*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2
)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*tan(c/2)^2*tan(d*x/2)^4+27*b*pi*s
ign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2
-2*tan(d*x/2)-1)*tan(c/2)^2*tan(d*x/2)^2+9*b*pi*sign(tan(c/2)^2*tan(d*x/2)^
2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*tan(c/2)^
2+3*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-ta
n(d*x/2)^2-2*tan(d*x/2)-1)*tan(d*x/2)^6+9*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2
-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*tan(d*x/2)
^4+9*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-t
an(d*x/2)^2-2*tan(d*x/2)-1)*tan(d*x/2)^2+3*b*pi*sign(tan(c/2)^2*tan(d*x/2)^
2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)-6*b*pi*si
gn(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)
*tan(c/2)^6*tan(d*x/2)^6-18*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*
tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^6*tan(d*x/2)^4-18*b*pi*sign(ta
n(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(
c/2)^6*tan(d*x/2)^2-6*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/
2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^6-18*b*pi*sign(tan(c/2)^2*tan(d*x/2)
^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^4*tan(d*x/2)^6
-54*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(
d*x/2)^2+1)*tan(c/2)^4*tan(d*x/2)^4-54*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-ta
```

n(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^4*tan(d*x/2)^2-18*b
*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2
)^2+1)*tan(c/2)^4-18*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2
)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^2*tan(d*x/2)^6-54*b*pi*sign(tan(c/2)^
2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^2*
tan(d*x/2)^4-54*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan
(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^2*tan(d*x/2)^2-18*b*pi*sign(tan(c/2)^2*tan
(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^2-6*b*p
i*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^
2+1)*tan(d*x/2)^6-18*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2
)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(d*x/2)^4-18*b*pi*sign(tan(c/2)^2*tan(d*x/2
)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(d*x/2)^2-6*b*pi*si
gn(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)
+6*b*pi*tan(c/2)^6*tan(d*x/2)^6+18*b*pi*tan(c/2)^6*tan(d*x/2)^4+18*b*pi*tan
(c/2)^6*tan(d*x/2)^2+6*b*pi*tan(c/2)^6+18*b*pi*tan(c/2)^4*tan(d*x/2)^6+54*b
*pi*tan(c/2)^4*tan(d*x/2)^4+54*b*pi*tan(c/2)^4*tan(d*x/2)^2+18*b*pi*tan(c/2
)^4+18*b*pi*tan(c/2)^2*tan(d*x/2)^6+54*b*pi*tan(c/2)^2*tan(d*x/2)^4+54*b*pi
*tan(c/2)^2*tan(d*x/2)^2+18*b*pi*tan(c/2)^2+6*b*pi*tan(d*x/2)^6+18*b*pi*tan
(d*x/2)^4+18*b*pi*tan(d*x/2)^2+6*b*pi+6*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2
)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^6*tan
(d*x/2)^6+18*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*t
an(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^6*tan(d*x/2)^4+18*b*atan((tan(c/
2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/
2)-1))*tan(c/2)^6*tan(d*x/2)^2+6*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d
*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^6+18*b*atan(
(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-t
an(d*x/2)-1))*tan(c/2)^4*tan(d*x/2)^6+54*b*atan((tan(c/2)*tan(d*x/2)+tan(c/
2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^4*ta
n(d*x/2)^4+54*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*
tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^4*tan(d*x/2)^2+18*b*atan((tan(c
/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x
/2)-1))*tan(c/2)^4+18*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(t
an(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^2*tan(d*x/2)^6+54*b*ata
n((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)
-tan(d*x/2)-1))*tan(c/2)^2*tan(d*x/2)^4+54*b*atan((tan(c/2)*tan(d*x/2)+tan(
c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^2*
tan(d*x/2)^2+18*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2
)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^2+6*b*atan((tan(c/2)*tan(d*x/
2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(
d*x/2)^6+18*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*ta
n(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(d*x/2)^4+18*b*atan((tan(c/2)*tan(d*x/2
)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(d
*x/2)^2+6*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(
d*x/2)-tan(c/2)-tan(d*x/2)-1))-6*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d
*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^6*tan(d*x/2)
^6-18*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/
2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^6*tan(d*x/2)^4-18*b*atan((tan(c/2)*tan(
d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*
tan(c/2)^6*tan(d*x/2)^2-6*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1
)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^6-18*b*atan((tan(c/
2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/
2)+1))*tan(c/2)^4*tan(d*x/2)^6-54*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(
d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^4*tan(d*x/2
)^4-54*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x
/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^4*tan(d*x/2)^2-18*b*atan((tan(c/2)*tan
(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))
*tan(c/2)^4-18*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)
*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^2*tan(d*x/2)^6-54*b*atan((tan(
c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*

x/2)+1))*tan(c/2)^2*tan(d*x/2)^4-54*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-ta
n(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^2*tan(d*x
/2)^2-18*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d
*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^2-6*b*atan((tan(c/2)*tan(d*x/2)+tan(
c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(d*x/2)^
6-18*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2
)-tan(c/2)+tan(d*x/2)+1))*tan(d*x/2)^4-18*b*atan((tan(c/2)*tan(d*x/2)+tan(c
/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(d*x/2)^2
-6*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-
tan(c/2)+tan(d*x/2)+1))-6*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1
)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^6*tan(d*x/2)^6-18*b
*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(
c/2)-tan(d*x/2)+1))*tan(c/2)^6*tan(d*x/2)^4-18*b*atan((tan(c/2)*tan(d*x/2)-
tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2
)^6*tan(d*x/2)^2-6*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(
c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^6-18*b*atan((tan(c/2)*tan(
d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*
tan(c/2)^4*tan(d*x/2)^6-54*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+
1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^4*tan(d*x/2)^4-54*
b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan
(c/2)-tan(d*x/2)+1))*tan(c/2)^4*tan(d*x/2)^2-18*b*atan((tan(c/2)*tan(d*x/2)
-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/
2)^4-18*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*
x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^2*tan(d*x/2)^6-54*b*atan((tan(c/2)*ta
n(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)
)*tan(c/2)^2*tan(d*x/2)^4-54*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2
)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^2*tan(d*x/2)^2-1
8*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+t
an(c/2)-tan(d*x/2)+1))*tan(c/2)^2-6*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+ta
n(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(d*x/2)^6-18*b*
atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c
/2)-tan(d*x/2)+1))*tan(d*x/2)^4-18*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan
(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(d*x/2)^2-6*b*at
an((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2
)-tan(d*x/2)+1))+6*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(
c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^6*tan(d*x/2)^6+18*b*atan((
tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+ta
n(d*x/2)-1))*tan(c/2)^6*tan(d*x/2)^4+18*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2
)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^6*tan
(d*x/2)^2+6*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*ta
n(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^6+18*b*atan((tan(c/2)*tan(d*x/2)-
tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2
)^4*tan(d*x/2)^6+54*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan
(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^4*tan(d*x/2)^4+54*b*atan(
(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+t
an(d*x/2)-1))*tan(c/2)^4*tan(d*x/2)^2+18*b*atan((tan(c/2)*tan(d*x/2)-tan(c/
2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^4+18
*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+ta
n(c/2)+tan(d*x/2)-1))*tan(c/2)^2*tan(d*x/2)^6+54*b*atan((tan(c/2)*tan(d*x/2
)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c
/2)^2*tan(d*x/2)^4+54*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(t
an(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^2*tan(d*x/2)^2+18*b*ata
n((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)
+tan(d*x/2)-1))*tan(c/2)^2+6*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2
)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(d*x/2)^6+18*b*atan((t
an(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan
(d*x/2)-1))*tan(d*x/2)^4+18*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)
-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(d*x/2)^2+6*b*atan((tan
(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d

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*x/2)-1))-32*b*tan(c/2)^6*tan(d*x/2)^6+96*b*tan(c/2)^6*tan(d*x/2)^4-96*b*ta
n(c/2)^6*tan(d*x/2)^2+32*b*tan(c/2)^6+384*b*tan(c/2)^5*tan(d*x/2)^5-768*b*t
an(c/2)^5*tan(d*x/2)^3+384*b*tan(c/2)^5*tan(d*x/2)+96*b*tan(c/2)^4*tan(d*x/
2)^6-1824*b*tan(c/2)^4*tan(d*x/2)^4+1824*b*tan(c/2)^4*tan(d*x/2)^2-96*b*tan
(c/2)^4-768*b*tan(c/2)^3*tan(d*x/2)^5+3584*b*tan(c/2)^3*tan(d*x/2)^3-768*b*
tan(c/2)^3*tan(d*x/2)-96*b*tan(c/2)^2*tan(d*x/2)^6+1824*b*tan(c/2)^2*tan(d*
x/2)^4-1824*b*tan(c/2)^2*tan(d*x/2)^2+96*b*tan(c/2)^2+384*b*tan(c/2)*tan(d*
x/2)^5-768*b*tan(c/2)*tan(d*x/2)^3+384*b*tan(c/2)*tan(d*x/2)+32*b*tan(d*x/2
)^6-96*b*tan(d*x/2)^4+96*b*tan(d*x/2)^2-32*b)/(96*d*tan(c/2)^6*tan(d*x/2)^6
+288*d*tan(c/2)^6*tan(d*x/2)^4+288*d*tan(c/2)^6*tan(d*x/2)^2+96*d*tan(c/2)^
6+288*d*tan(c/2)^4*tan(d*x/2)^6+864*d*tan(c/2)^4*tan(d*x/2)^4+864*d*tan(c/2
)^4*tan(d*x/2)^2+288*d*tan(c/2)^4+288*d*tan(c/2)^2*tan(d*x/2)^6+864*d*tan(c
/2)^2*tan(d*x/2)^4+864*d*tan(c/2)^2*tan(d*x/2)^2+288*d*tan(c/2)^2+96*d*tan(
d*x/2)^6+288*d*tan(d*x/2)^4+288*d*tan(d*x/2)^2+96*d)
```

maple [A] time = 0.39, size = 36, normalized size = 0.82

$$\frac{-\frac{\left(\cos^3(dx+c)\right)b}{3}+\frac{a\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3*(a+b*tan(d*x+c)),x)
[Out] 1/d*(-1/3*cos(d*x+c)^3*b+1/3*a*(2+cos(d*x+c)^2)*sin(d*x+c))
```

maxima [A] time = 0.33, size = 35, normalized size = 0.80

$$-\frac{b\cos\left(dx+c\right)^3+\left(\sin\left(dx+c\right)^3-3\,\sin\left(dx+c\right)\right)a}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+b*tan(d*x+c)),x, algorithm="maxima")
[Out] -1/3*(b*cos(d*x + c)^3 + (sin(d*x + c)^3 - 3*sin(d*x + c))*a)/d
```

mupad [B] time = 3.76, size = 47, normalized size = 1.07

$$\frac{2\,a\,\sin\left(c+d\,x\right)}{3\,d}-\frac{b\cos\left(c+d\,x\right)^3}{3\,d}+\frac{a\cos\left(c+d\,x\right)^2\,\sin\left(c+d\,x\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3*(a + b*tan(c + d*x)),x)
[Out] (2*a*sin(c + d*x))/(3*d) - (b*cos(c + d*x)^3)/(3*d) + (a*cos(c + d*x)^2*sin
(c + d*x))/(3*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a+b\tan\left(c+dx\right)\right)\cos^3\left(c+dx\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3*(a+b*tan(d*x+c)),x)
[Out] Integral((a + b*tan(c + d*x))*cos(c + d*x)**3, x)
```

3.516 $\int \cos^4(c+dx)(a+b\tan(c+dx))\,dx$

Optimal. Leaf size=65

$$\frac{a\sin(c+dx)\cos^3(c+dx)}{4d}+\frac{3a\sin(c+dx)\cos(c+dx)}{8d}+\frac{3ax}{8}-\frac{b\cos^4(c+dx)}{4d}$$

```
[Out] 3/8*a*x-1/4*b*cos(d*x+c)^4/d+3/8*a*cos(d*x+c)*sin(d*x+c)/d+1/4*a*cos(d*x+c)
^3*sin(d*x+c)/d
```

Rubi [A] time = 0.04, antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {3486, 2635, 8}

$$\frac{a\sin(c+dx)\cos^3(c+dx)}{4d}+\frac{3a\sin(c+dx)\cos(c+dx)}{8d}+\frac{3ax}{8}-\frac{b\cos^4(c+dx)}{4d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4*(a + b*Tan[c + d*x]),x]
```

```
[Out] (3*a*x)/8 - (b*Cos[c + d*x]^4)/(4*d) + (3*a*Cos[c + d*x]*Sin[c + d*x])/(8*d
) + (a*Cos[c + d*x]^3*Sin[c + d*x])/(4*d)
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2635

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Sin[c + d*x])^(n - 1))/(d*n), x] + Dist[(b^2*(n - 1))/n, Int[(b*Sin[c
+ d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] && IntegerQ[2*n
]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rubi steps

$$\begin{aligned}\int \cos^4(c+dx)(a+b\tan(c+dx))\,dx &= -\frac{b\cos^4(c+dx)}{4d}+a\int \cos^4(c+dx)\,dx\\ &= -\frac{b\cos^4(c+dx)}{4d}+\frac{a\cos^3(c+dx)\sin(c+dx)}{4d}+\frac{1}{4}(3a)\int \cos^2(c+dx)\,dx\\ &= -\frac{b\cos^4(c+dx)}{4d}+\frac{3a\cos(c+dx)\sin(c+dx)}{8d}+\frac{a\cos^3(c+dx)\sin(c+dx)}{4d}\\ &= \frac{3ax}{8}-\frac{b\cos^4(c+dx)}{4d}+\frac{3a\cos(c+dx)\sin(c+dx)}{8d}+\frac{a\cos^3(c+dx)\sin(c+dx)}{4d}\end{aligned}$$

Mathematica [A] time = 0.10, size = 62, normalized size = 0.95

$$\frac{3a(c+dx)}{8d}+\frac{a\sin(2(c+dx))}{4d}+\frac{a\sin(4(c+dx))}{32d}-\frac{b\cos^4(c+dx)}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4*(a + b*Tan[c + d*x]),x]
```

```
[Out] (3*a*(c + d*x))/(8*d) - (b*Cos[c + d*x]^4)/(4*d) + (a*Sin[2*(c + d*x)])/(4*
d) + (a*Sin[4*(c + d*x)])/(32*d)
```

fricas [A] time = 0.64, size = 51, normalized size = 0.78

$$-\frac{2\,b\cos\left(dx+c\right)^{4}-3\,adx-\left(2\,a\cos\left(dx+c\right)^{3}+3\,a\cos\left(dx+c\right)\right)\sin\left(dx+c\right)}{8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+b*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] -1/8*(2*b*cos(d*x + c)^4 - 3*a*d*x - (2*a*cos(d*x + c)^3 + 3*a*cos(d*x + c)
)*sin(d*x + c))/d
```

giac [B] time = 0.52, size = 426, normalized size = 6.55

$$\frac{12\,adx\tan\left(dx\right)^{4}\tan(c)^{4}+24\,adx\tan\left(dx\right)^{4}\tan(c)^{2}+24\,adx\tan\left(dx\right)^{2}\tan(c)^{4}-5\,b\tan\left(dx\right)^{4}\tan(c)^{4}-20\,a\tan}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+b*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/32*(12*a*d*x*tan(d*x)^4*tan(c)^4 + 24*a*d*x*tan(d*x)^4*tan(c)^2 + 24*a*d*
x*tan(d*x)^2*tan(c)^4 - 5*b*tan(d*x)^4*tan(c)^4 - 20*a*tan(d*x)^4*tan(c)^3
- 20*a*tan(d*x)^3*tan(c)^4 + 12*a*d*x*tan(d*x)^4 + 48*a*d*x*tan(d*x)^2*tan(
c)^2 + 6*b*tan(d*x)^4*tan(c)^2 + 32*b*tan(d*x)^3*tan(c)^3 + 12*a*d*x*tan(c)
^4 + 6*b*tan(d*x)^2*tan(c)^4 - 12*a*tan(d*x)^4*tan(c) + 24*a*tan(d*x)^3*tan
(c)^2 + 24*a*tan(d*x)^2*tan(c)^3 - 12*a*tan(d*x)*tan(c)^4 + 24*a*d*x*tan(d*
x)^2 + 3*b*tan(d*x)^4 + 24*a*d*x*tan(c)^2 - 36*b*tan(d*x)^2*tan(c)^2 + 3*b*
tan(c)^4 + 12*a*tan(d*x)^3 - 24*a*tan(d*x)^2*tan(c) - 24*a*tan(d*x)*tan(c)^
2 + 12*a*tan(c)^3 + 12*a*d*x + 6*b*tan(d*x)^2 + 32*b*tan(d*x)*tan(c) + 6*b*
tan(c)^2 + 20*a*tan(d*x) + 20*a*tan(c) - 5*b)/(d*tan(d*x)^4*tan(c)^4 + 2*d*
tan(d*x)^4*tan(c)^2 + 2*d*tan(d*x)^2*tan(c)^4 + d*tan(d*x)^4 + 4*d*tan(d*x)
^2*tan(c)^2 + d*tan(c)^4 + 2*d*tan(d*x)^2 + 2*d*tan(c)^2 + d)
```

maple [A] time = 0.39, size = 52, normalized size = 0.80

$$\frac{-\frac{\left(\cos^{4}\left(dx+c\right)\right)b}{4}+a\left(\frac{\left(\cos^{3}\left(dx+c\right)+\frac{3\cos\left(dx+c\right)}{2}\right)\sin\left(dx+c\right)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4*(a+b*tan(d*x+c)),x)
```

```
[Out] 1/d*(-1/4*b*cos(d*x+c)^4+a*(1/4*(cos(d*x+c)^3+3/2*cos(d*x+c))*sin(d*x+c)+3/
8*d*x+3/8*c))
```

maxima [A] time = 0.43, size = 61, normalized size = 0.94

$$\frac{3\,(dx+c)a+\frac{3\,a\tan(dx+c)^{3}+5\,a\tan(dx+c)-2\,b}{\tan(dx+c)^{4}+2\,\tan(dx+c)^{2}+1}}{8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+b*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/8*(3*(d*x + c)*a + (3*a*tan(d*x + c)^3 + 5*a*tan(d*x + c) - 2*b)/(tan(d*x
 + c)^4 + 2*tan(d*x + c)^2 + 1))/d
```

mupad [B] time = 3.71, size = 41, normalized size = 0.63

$$\frac{3\,a\,x}{8}+\frac{\cos\left(c+d\,x\right)^4\,\left(\frac{3\,a\,\mathrm{tan}\left(c+d\,x\right)^3}{8}+\frac{5\,a\,\mathrm{tan}\left(c+d\,x\right)}{8}-\frac{b}{4}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4*(a + b*tan(c + d*x)),x)
```

```
[Out] (3*a*x)/8 + (cos(c + d*x)^4*((5*a*tan(c + d*x))/8 - b/4 + (3*a*tan(c + d*x)
^3)/8))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+b\tan(c+dx))\cos^4(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4*(a+b*tan(d*x+c)),x)
```

```
[Out] Integral((a + b*tan(c + d*x))*cos(c + d*x)**4, x)
```

3.517 $\int \sec^8(c+dx)(a+b\tan(c+dx))^2\,dx$

Optimal. Leaf size=119

$$\frac{(a^2+3b^2)\tan^7(c+dx)}{7d}+\frac{3(a^2+b^2)\tan^5(c+dx)}{5d}+\frac{(3a^2+b^2)\tan^3(c+dx)}{3d}+\frac{a^2\tan(c+dx)}{d}+\frac{ab\sec^8(c+dx)}{4d}+$$

```
[Out] 1/4*a*b*sec(d*x+c)^8/d+a^2*tan(d*x+c)/d+1/3*(3*a^2+b^2)*tan(d*x+c)^3/d+3/5*
(a^2+b^2)*tan(d*x+c)^5/d+1/7*(a^2+3*b^2)*tan(d*x+c)^7/d+1/9*b^2*tan(d*x+c)^
9/d
```

Rubi [A] time = 0.11, antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3506, 696, 1810}

$$\frac{(a^2+3b^2)\tan^7(c+dx)}{7d}+\frac{3(a^2+b^2)\tan^5(c+dx)}{5d}+\frac{(3a^2+b^2)\tan^3(c+dx)}{3d}+\frac{a^2\tan(c+dx)}{d}+\frac{ab\sec^8(c+dx)}{4d}+$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^8*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (a*b*Sec[c + d*x]^8)/(4*d) + (a^2*Tan[c + d*x])/d + ((3*a^2 + b^2)*Tan[c +
d*x]^3)/(3*d) + (3*(a^2 + b^2)*Tan[c + d*x]^5)/(5*d) + ((a^2 + 3*b^2)*Tan[c
 + d*x]^7)/(7*d) + (b^2*Tan[c + d*x]^9)/(9*d)
```

Rule 696

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*m*d^(m - 1)*(a + c*x^2)^(p + 1))/(2*c*(p + 1)), x] + Int[((d + e*x)^m -
e*m*d^(m - 1)*x)*(a + c*x^2)^p, x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^2 +
 a*e^2, 0] && IGtQ[p, 1] && IGtQ[m, 0] && LeQ[m, p]
```

Rule 1810

```
Int[(Pq_)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[Pq*
(a + b*x^2)^p, x], x] /; FreeQ[{a, b}, x] && PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\int \sec^8(c+dx)(a+b\tan(c+dx))^2\,dx=\frac{\text{Subst}\left(\int (a+x)^2\left(1+\frac{x^2}{b^2}\right)^3\,dx,x,b\tan(c+dx)\right)}{bd}$$

$$=\frac{ab\sec^8(c+dx)}{4d}+\frac{\text{Subst}\left(\int \left(1+\frac{x^2}{b^2}\right)^3\left(-2ax+(a+x)^2\right)\,dx,x,b\tan(c\right.}{bd}$$

$$=\frac{ab\sec^8(c+dx)}{4d}+\frac{\text{Subst}\left(\int \left(a^2+\frac{(3a^2+b^2)x^2}{b^2}+\frac{3(a^2+b^2)x^4}{b^4}+\frac{(a^2+3b^2)x^6}{b^6}+\right.\right.}{bd}$$

$$=\frac{ab\sec^8(c+dx)}{4d}+\frac{a^2\tan(c+dx)}{d}+\frac{(3a^2+b^2)\tan^3(c+dx)}{3d}+\frac{3(a^2+}{}$$

Mathematica [A] time = 0.58, size = 133, normalized size = 1.12

$$\frac{\tan(c+dx)\left(180\left(a^2+3b^2\right)\tan^6(c+dx)+756\left(a^2+b^2\right)\tan^4(c+dx)+420\left(3a^2+b^2\right)\tan^2(c+dx)+1260a^2+3}{1260a}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^8*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (Tan[c + d*x]*(1260*a^2 + 1260*a*b*Tan[c + d*x] + 420*(3*a^2 + b^2)*Tan[c +
 d*x]^2 + 1890*a*b*Tan[c + d*x]^3 + 756*(a^2 + b^2)*Tan[c + d*x]^4 + 1260*a
*b*Tan[c + d*x]^5 + 180*(a^2 + 3*b^2)*Tan[c + d*x]^6 + 315*a*b*Tan[c + d*x]
^7 + 140*b^2*Tan[c + d*x]^8))/(1260*d)
```

fricas [A] time = 0.68, size = 122, normalized size = 1.03

$$\frac{315\,ab\cos(dx+c)+4\left(16\left(9\,a^2-b^2\right)\cos(dx+c)^8+8\left(9\,a^2-b^2\right)\cos(dx+c)^6+6\left(9\,a^2-b^2\right)\cos(dx+c)^4+5\left(\right.}{1260\,d\cos(dx+c)^9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/1260*(315*a*b*cos(d*x + c) + 4*(16*(9*a^2 - b^2)*cos(d*x + c)^8 + 8*(9*a^
2 - b^2)*cos(d*x + c)^6 + 6*(9*a^2 - b^2)*cos(d*x + c)^4 + 5*(9*a^2 - b^2)*
cos(d*x + c)^2 + 35*b^2)*sin(d*x + c))/(d*cos(d*x + c)^9)
```

giac [A] time = 0.82, size = 156, normalized size = 1.31

$$140\,b^2\tan(dx+c)^9+315\,ab\tan(dx+c)^8+180\,a^2\tan(dx+c)^7+540\,b^2\tan(dx+c)^7+1260\,ab\tan(dx+c)^6+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/1260*(140*b^2*tan(d*x + c)^9 + 315*a*b*tan(d*x + c)^8 + 180*a^2*tan(d*x +
 c)^7 + 540*b^2*tan(d*x + c)^7 + 1260*a*b*tan(d*x + c)^6 + 756*a^2*tan(d*x
+ c)^5 + 756*b^2*tan(d*x + c)^5 + 1890*a*b*tan(d*x + c)^4 + 1260*a^2*tan(d*
x + c)^3 + 420*b^2*tan(d*x + c)^3 + 1260*a*b*tan(d*x + c)^2 + 1260*a^2*tan(
d*x + c))/d
```

maple [A] time = 0.41, size = 138, normalized size = 1.16

$$\frac{-a^2\left(-\frac{16}{35}-\frac{\left(\sec^6(dx+c)\right)}{7}-\frac{6\left(\sec^4(dx+c)\right)}{35}-\frac{8\left(\sec^2(dx+c)\right)}{35}\right)\tan(dx+c)+\frac{ab}{4\cos(dx+c)^8}+b^2\left(\frac{\sin^3(dx+c)}{9\cos(dx+c)^9}+\frac{2\left(\sin^3(dx+c)\right)}{21\cos(dx+c)^7}+\frac{8(\mathrm{si}}{105\,\mathrm{c}}\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^8*(a+b*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(-a^2*(-16/35-1/7*sec(d*x+c)^6-6/35*sec(d*x+c)^4-8/35*sec(d*x+c)^2)*tan
(d*x+c)+1/4*a*b/cos(d*x+c)^8+b^2*(1/9*sin(d*x+c)^3/cos(d*x+c)^9+2/21*sin(d*
x+c)^3/cos(d*x+c)^7+8/105*sin(d*x+c)^3/cos(d*x+c)^5+16/315*sin(d*x+c)^3/cos
(d*x+c)^3))
```

maxima [A] time = 0.33, size = 133, normalized size = 1.12

$$\frac{140\,b^2\tan(dx+c)^9+315\,ab\tan(dx+c)^8+1260\,ab\tan(dx+c)^6+180\left(a^2+3\,b^2\right)\tan(dx+c)^7+1890\,ab\tan(}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/1260*(140*b^2*tan(d*x + c)^9 + 315*a*b*tan(d*x + c)^8 + 1260*a*b*tan(d*x
+ c)^6 + 180*(a^2 + 3*b^2)*tan(d*x + c)^7 + 1890*a*b*tan(d*x + c)^4 + 756*(
a^2 + b^2)*tan(d*x + c)^5 + 1260*a*b*tan(d*x + c)^2 + 420*(3*a^2 + b^2)*tan
(d*x + c)^3 + 1260*a^2*tan(d*x + c))/d
```

mupad [B] time = 3.68, size = 132, normalized size = 1.11

$$\frac{\tan(c+d\,x)^3\,\left(a^2+\frac{b^2}{3}\right)+a^2\,\tan(c+d\,x)+\tan(c+d\,x)^5\,\left(\frac{3\,a^2}{5}+\frac{3\,b^2}{5}\right)+\tan(c+d\,x)^7\,\left(\frac{a^2}{7}+\frac{3\,b^2}{7}\right)+\frac{b^2\tan(c+d\,x)}{9}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))^2/cos(c + d*x)^8,x)
```

```
[Out] (tan(c + d*x)^3*(a^2 + b^2/3) + a^2*tan(c + d*x) + tan(c + d*x)^5*((3*a^2)/
5 + (3*b^2)/5) + tan(c + d*x)^7*(a^2/7 + (3*b^2)/7) + (b^2*tan(c + d*x)^9)/
9 + a*b*tan(c + d*x)^2 + (3*a*b*tan(c + d*x)^4)/2 + a*b*tan(c + d*x)^6 + (a
*b*tan(c + d*x)^8)/4)/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+b\tan(c+dx))^2\sec^8(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8*(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**2*sec(c + d*x)**8, x)
```

3.518 $\int \sec^6(c+dx)(a+b\tan(c+dx))^2\,dx$

Optimal. Leaf size=97

$$\frac{(a^2+2b^2)\tan^5(c+dx)}{5d}+\frac{(2a^2+b^2)\tan^3(c+dx)}{3d}+\frac{a^2\tan(c+dx)}{d}+\frac{ab\sec^6(c+dx)}{3d}+\frac{b^2\tan^7(c+dx)}{7d}$$

```
[Out] 1/3*a*b*sec(d*x+c)^6/d+a^2*tan(d*x+c)/d+1/3*(2*a^2+b^2)*tan(d*x+c)^3/d+1/5*
(a^2+2*b^2)*tan(d*x+c)^5/d+1/7*b^2*tan(d*x+c)^7/d
```

Rubi [A] time = 0.08, antiderivative size = 97, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3506, 696, 1810}

$$\frac{(a^2+2b^2)\tan^5(c+dx)}{5d}+\frac{(2a^2+b^2)\tan^3(c+dx)}{3d}+\frac{a^2\tan(c+dx)}{d}+\frac{ab\sec^6(c+dx)}{3d}+\frac{b^2\tan^7(c+dx)}{7d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (a*b*Sec[c + d*x]^6)/(3*d) + (a^2*Tan[c + d*x])/d + ((2*a^2 + b^2)*Tan[c +
d*x]^3)/(3*d) + ((a^2 + 2*b^2)*Tan[c + d*x]^5)/(5*d) + (b^2*Tan[c + d*x]^7)
/(7*d)
```

Rule 696

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*m*d^(m - 1)*(a + c*x^2)^(p + 1))/(2*c*(p + 1)), x] + Int[((d + e*x)^m -
e*m*d^(m - 1)*x)*(a + c*x^2)^p, x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^2 +
 a*e^2, 0] && IGtQ[p, 1] && IGtQ[m, 0] && LeQ[m, p]
```

Rule 1810

```
Int[(Pq_)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[Pq*
(a + b*x^2)^p, x], x] /; FreeQ[{a, b}, x] && PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}
\int \sec^6(c+dx)(a+b\tan(c+dx))^2\,dx &= \frac{\text{Subst}\left(\int (a+x)^2\left(1+\frac{x^2}{b^2}\right)^2\,dx,x,b\tan(c+dx)\right)}{bd}\\
&= \frac{ab\sec^6(c+dx)}{3d}+\frac{\text{Subst}\left(\int \left(1+\frac{x^2}{b^2}\right)^2\left(-2ax+(a+x)^2\right)\,dx,x,b\tan(c+\right.}{bd}\\
&= \frac{ab\sec^6(c+dx)}{3d}+\frac{\text{Subst}\left(\int \left(a^2+\frac{(2a^2+b^2)x^2}{b^2}+\frac{(a^2+2b^2)x^4}{b^4}+\frac{x^6}{b^4}\right)\,dx,x,b\,\text{ta}\right.}{bd}\\
&= \frac{ab\sec^6(c+dx)}{3d}+\frac{a^2\tan(c+dx)}{d}+\frac{(2a^2+b^2)\tan^3(c+dx)}{3d}+\frac{(a^2+2b^2}{}
\end{aligned}$$

Mathematica [A] time = 0.65, size = 104, normalized size = 1.07

$$\frac{\tan(c+dx)\left(21\left(a^2+2b^2\right)\tan^4(c+dx)+35\left(2a^2+b^2\right)\tan^2(c+dx)+105a^2+35ab\tan^5(c+dx)+105ab\tan\right.}{105d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (Tan[c + d*x]*(105*a^2 + 105*a*b*Tan[c + d*x] + 35*(2*a^2 + b^2)*Tan[c + d*
x]^2 + 105*a*b*Tan[c + d*x]^3 + 21*(a^2 + 2*b^2)*Tan[c + d*x]^4 + 35*a*b*Ta
n[c + d*x]^5 + 15*b^2*Tan[c + d*x]^6))/(105*d)
```

fricas [A] time = 0.64, size = 100, normalized size = 1.03

$$\frac{35\,ab\cos\left(dx+c\right)+\left(8\left(7\,a^2-b^2\right)\cos\left(dx+c\right)^6+4\left(7\,a^2-b^2\right)\cos\left(dx+c\right)^4+3\left(7\,a^2-b^2\right)\cos\left(dx+c\right)^2+15\right.}{105\,d\cos\left(dx+c\right)^7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/105*(35*a*b*cos(d*x + c) + (8*(7*a^2 - b^2)*cos(d*x + c)^6 + 4*(7*a^2 - b
^2)*cos(d*x + c)^4 + 3*(7*a^2 - b^2)*cos(d*x + c)^2 + 15*b^2)*sin(d*x + c))
/(d*cos(d*x + c)^7)
```

giac [A] time = 0.53, size = 118, normalized size = 1.22

$$\frac{15\,b^2\tan\left(dx+c\right)^7+35\,ab\tan\left(dx+c\right)^6+21\,a^2\tan\left(dx+c\right)^5+42\,b^2\tan\left(dx+c\right)^5+105\,ab\tan\left(dx+c\right)^4+70}{105\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/105*(15*b^2*tan(d*x + c)^7 + 35*a*b*tan(d*x + c)^6 + 21*a^2*tan(d*x + c)^
5 + 42*b^2*tan(d*x + c)^5 + 105*a*b*tan(d*x + c)^4 + 70*a^2*tan(d*x + c)^3
+ 35*b^2*tan(d*x + c)^3 + 105*a*b*tan(d*x + c)^2 + 105*a^2*tan(d*x + c))/d
```

maple [A] time = 0.41, size = 110, normalized size = 1.13

$$\frac{-a^2\left(-\frac{8}{15}-\frac{\left(\sec^4(dx+c)\right)}{5}-\frac{4\left(\sec^2(dx+c)\right)}{15}\right)\tan\left(dx+c\right)+\frac{ab}{3\cos(dx+c)^6}+b^2\left(\frac{\sin^3(dx+c)}{7\cos(dx+c)^7}+\frac{4\left(\sin^3(dx+c)\right)}{35\cos(dx+c)^5}+\frac{8\left(\sin^3(dx+c)\right)}{105\cos(dx+c)^3}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6*(a+b*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(-a^2*(-8/15-1/5*sec(d*x+c)^4-4/15*sec(d*x+c)^2)*tan(d*x+c)+1/3*a*b/cos
(d*x+c)^6+b^2*(1/7*sin(d*x+c)^3/cos(d*x+c)^7+4/35*sin(d*x+c)^3/cos(d*x+c)^5
+8/105*sin(d*x+c)^3/cos(d*x+c)^3))
```

maxima [A] time = 0.33, size = 104, normalized size = 1.07

$$\frac{15\,b^2\tan\left(dx+c\right)^7+35\,ab\tan\left(dx+c\right)^6+105\,ab\tan\left(dx+c\right)^4+21\left(a^2+2\,b^2\right)\tan\left(dx+c\right)^5+105\,ab\tan\left(dx+\right.}{105\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/105*(15*b^2*tan(d*x + c)^7 + 35*a*b*tan(d*x + c)^6 + 105*a*b*tan(d*x + c)
^4 + 21*(a^2 + 2*b^2)*tan(d*x + c)^5 + 105*a*b*tan(d*x + c)^2 + 35*(2*a^2 +
 b^2)*tan(d*x + c)^3 + 105*a^2*tan(d*x + c))/d
```

mupad [B] time = 3.57, size = 102, normalized size = 1.05

$$\frac{a^2 \tan(c+d\,x) + \tan(c+d\,x)^3 \left(\frac{2\,a^2}{3} + \frac{b^2}{3}\right) + \tan(c+d\,x)^5 \left(\frac{a^2}{5} + \frac{2\,b^2}{5}\right) + \frac{b^2 \tan(c+d\,x)^7}{7} + a\,b \tan(c+d\,x)^2 + a\,b \tan}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))^2/cos(c + d*x)^6,x)
```

```
[Out] (a^2*tan(c + d*x) + tan(c + d*x)^3*((2*a^2)/3 + b^2/3) + tan(c + d*x)^5*(a^
2/5 + (2*b^2)/5) + (b^2*tan(c + d*x)^7)/7 + a*b*tan(c + d*x)^2 + a*b*tan(c
+ d*x)^4 + (a*b*tan(c + d*x)^6)/3)/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a + b\tan(c + dx))^2 \sec^6(c + dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6*(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**2*sec(c + d*x)**6, x)
```

3.519 $\int \sec^4(c+dx)(a+b\tan(c+dx))^2\,dx$

Optimal. Leaf size=75

$$\frac{(a^2+b^2)(a+b\tan(c+dx))^3}{3b^3d}+\frac{(a+b\tan(c+dx))^5}{5b^3d}-\frac{a(a+b\tan(c+dx))^4}{2b^3d}$$

```
[Out] 1/3*(a^2+b^2)*(a+b*tan(d*x+c))^3/b^3/d-1/2*a*(a+b*tan(d*x+c))^4/b^3/d+1/5*(
a+b*tan(d*x+c))^5/b^3/d
```

Rubi [A] time = 0.07, antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {3506, 697}

$$\frac{(a^2+b^2)(a+b\tan(c+dx))^3}{3b^3d}+\frac{(a+b\tan(c+dx))^5}{5b^3d}-\frac{a(a+b\tan(c+dx))^4}{2b^3d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] ((a^2 + b^2)*(a + b*Tan[c + d*x])^3)/(3*b^3*d) - (a*(a + b*Tan[c + d*x])^4)
/(2*b^3*d) + (a + b*Tan[c + d*x])^5/(5*b^3*d)
```

Rule 697

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m},
 x] && NeQ[c*d^2 + a*e^2, 0] && IGtQ[p, 0]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^4(c+dx)(a+b\tan(c+dx))^2\,dx&=\frac{\text{Subst}\left(\int (a+x)^2\left(1+\frac{x^2}{b^2}\right)dx,x,b\tan(c+dx)\right)}{bd}\\&=\frac{\text{Subst}\left(\int \left(\frac{(a^2+b^2)(a+x)^2}{b^2}-\frac{2a(a+x)^3}{b^2}+\frac{(a+x)^4}{b^2}\right)dx,x,b\tan(c+dx)\right)}{bd}\\&=\frac{(a^2+b^2)(a+b\tan(c+dx))^3}{3b^3d}-\frac{a(a+b\tan(c+dx))^4}{2b^3d}+\frac{(a+b\tan(c+dx))^5}{5b^3d}\end{aligned}$$

Mathematica [A] time = 0.19, size = 54, normalized size = 0.72

$$\frac{(a+b\tan(c+dx))^3\left(a^2-3ab\tan(c+dx)+6b^2\tan^2(c+dx)+10b^2\right)}{30b^3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] ((a + b*Tan[c + d*x])^3*(a^2 + 10*b^2 - 3*a*b*Tan[c + d*x] + 6*b^2*Tan[c +
d*x]^2))/(30*b^3*d)
```

fricas [A] time = 0.62, size = 79, normalized size = 1.05

$$\frac{15\,ab\cos\left(dx+c\right)+2\left(2\left(5\,a^2-b^2\right)\cos\left(dx+c\right)^4+\left(5\,a^2-b^2\right)\cos\left(dx+c\right)^2+3\,b^2\right)\sin\left(dx+c\right)}{30\,d\cos\left(dx+c\right)^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/30*(15*a*b*cos(d*x + c) + 2*(2*(5*a^2 - b^2)*cos(d*x + c)^4 + (5*a^2 - b^
2)*cos(d*x + c)^2 + 3*b^2)*sin(d*x + c))/(d*cos(d*x + c)^5)
```

giac [A] time = 0.50, size = 80, normalized size = 1.07

$$\frac{6\,b^2\tan\left(dx+c\right)^5+15\,ab\tan\left(dx+c\right)^4+10\,a^2\tan\left(dx+c\right)^3+10\,b^2\tan\left(dx+c\right)^3+30\,ab\tan\left(dx+c\right)^2+30\,a^2\tan}{30\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/30*(6*b^2*tan(d*x + c)^5 + 15*a*b*tan(d*x + c)^4 + 10*a^2*tan(d*x + c)^3
+ 10*b^2*tan(d*x + c)^3 + 30*a*b*tan(d*x + c)^2 + 30*a^2*tan(d*x + c))/d
```

maple [A] time = 0.41, size = 82, normalized size = 1.09

$$\frac{-a^2\left(-\frac{2}{3}-\frac{\left(\sec^2(dx+c)\right)}{3}\right)\tan\left(dx+c\right)+\frac{ab}{2\cos(dx+c)^4}+b^2\left(\frac{\sin^3(dx+c)}{5\cos(dx+c)^5}+\frac{2\left(\sin^3(dx+c)\right)}{15\cos(dx+c)^3}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4*(a+b*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(-a^2*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c)+1/2*a*b/cos(d*x+c)^4+b^2*(1/5*
sin(d*x+c)^3/cos(d*x+c)^5+2/15*sin(d*x+c)^3/cos(d*x+c)^3))
```

maxima [A] time = 0.34, size = 71, normalized size = 0.95

$$\frac{6\,b^2\tan\left(dx+c\right)^5+15\,ab\tan\left(dx+c\right)^4+30\,ab\tan\left(dx+c\right)^2+10\left(a^2+b^2\right)\tan\left(dx+c\right)^3+30\,a^2\tan\left(dx+c\right)}{30\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/30*(6*b^2*tan(d*x + c)^5 + 15*a*b*tan(d*x + c)^4 + 30*a*b*tan(d*x + c)^2
+ 10*(a^2 + b^2)*tan(d*x + c)^3 + 30*a^2*tan(d*x + c))/d
```

mupad [B] time = 3.55, size = 71, normalized size = 0.95

$$\frac{a^2\tan\left(c+d\,x\right)+\tan\left(c+d\,x\right)^3\left(\frac{a^2}{3}+\frac{b^2}{3}\right)+\frac{b^2\tan(c+d\,x)^5}{5}+a\,b\tan\left(c+d\,x\right)^2+\frac{a\,b\tan(c+d\,x)^4}{2}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))^2/cos(c + d*x)^4,x)
```

```
[Out] (a^2*tan(c + d*x) + tan(c + d*x)^3*(a^2/3 + b^2/3) + (b^2*tan(c + d*x)^5)/5
 + a*b*tan(c + d*x)^2 + (a*b*tan(c + d*x)^4)/2)/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a + b\tan(c + dx))^2 \sec^4(c + dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4*(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**2*sec(c + d*x)**4, x)
```

3.520 $\int \sec^2(c+dx)(a+b\tan(c+dx))^2\,dx$

Optimal. Leaf size=22

$$\frac{(a+b\tan(c+dx))^3}{3bd}$$

```
[Out] 1/3*(a+b*tan(d*x+c))^3/b/d
```

Rubi [A] time = 0.04, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {3506, 32}

$$\frac{(a+b\tan(c+dx))^3}{3bd}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (a + b*Tan[c + d*x])^3/(3*b*d)
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m + 1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^2(c+dx)(a+b\tan(c+dx))^2\,dx &= \frac{\text{Subst}\left(\int (a+x)^2\,dx, x, b\tan(c+dx)\right)}{bd}\\ &= \frac{(a+b\tan(c+dx))^3}{3bd}\end{aligned}$$

Mathematica [B] time = 0.04, size = 46, normalized size = 2.09

$$\frac{a^2\tan(c+dx)}{d}+\frac{ab\tan^2(c+dx)}{d}+\frac{b^2\tan^3(c+dx)}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (a^2*Tan[c + d*x])/d + (a*b*Tan[c + d*x]^2)/d + (b^2*Tan[c + d*x]^3)/(3*d)
```

fricas [B] time = 1.32, size = 55, normalized size = 2.50

$$\frac{3\,ab\cos(dx+c)+\left(\left(3\,a^2-b^2\right)\cos(dx+c)^2+b^2\right)\sin(dx+c)}{3\,d\cos(dx+c)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/3*(3*a*b*cos(d*x + c) + ((3*a^2 - b^2)*cos(d*x + c)^2 + b^2)*sin(d*x + c)
)/(d*cos(d*x + c)^3)
```

giac [B] time = 0.46, size = 41, normalized size = 1.86

$$\frac{b^2 \tan\left(dx+c\right)^3 + 3\,ab\tan\left(dx+c\right)^2 + 3\,a^2\tan\left(dx+c\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/3*(b^2*tan(d*x + c)^3 + 3*a*b*tan(d*x + c)^2 + 3*a^2*tan(d*x + c))/d
```

maple [B] time = 0.40, size = 48, normalized size = 2.18

$$\frac{a^2\tan\left(dx+c\right) + \frac{ab}{\cos(dx+c)^2} + \frac{b^2\left(\sin^3(dx+c)\right)}{3\cos(dx+c)^3}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2*(a+b*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(a^2*tan(d*x+c)+a*b/cos(d*x+c)^2+1/3*b^2*sin(d*x+c)^3/cos(d*x+c)^3)
```

maxima [A] time = 0.33, size = 20, normalized size = 0.91

$$\frac{\left(b\tan\left(dx+c\right)+a\right)^3}{3\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/3*(b*tan(d*x + c) + a)^3/(b*d)
```

mupad [B] time = 3.56, size = 39, normalized size = 1.77

$$\frac{a^2\tan\left(c+d\,x\right) + a\,b\tan\left(c+d\,x\right)^2 + \frac{b^2\tan(c+d\,x)^3}{3}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))^2/cos(c + d*x)^2,x)
```

```
[Out] (a^2*tan(c + d*x) + (b^2*tan(c + d*x)^3)/3 + a*b*tan(c + d*x)^2)/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a+b\tan\left(c+dx\right)\right)^2 \sec^2\left(c+dx\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2*(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**2*sec(c + d*x)**2, x)
```

3.521 $\int \cos^2(c+dx)(a+b\tan(c+dx))^2\,dx$

Optimal. Leaf size=49

$$\frac{1}{2}x\left(a^2+b^2\right)-\frac{\cos^2(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))}{2d}$$

```
[Out] 1/2*(a^2+b^2)*x-1/2*cos(d*x+c)^2*(b-a*tan(d*x+c))*(a+b*tan(d*x+c))/d
```

Rubi [A] time = 0.05, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3506, 723, 203}

$$\frac{1}{2}x\left(a^2+b^2\right)-\frac{\cos^2(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] ((a^2 + b^2)*x)/2 - (Cos[c + d*x]^2*(b - a*Tan[c + d*x])*(a + b*Tan[c + d*x
]))/(2*d)
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 723

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m - 1)*(a*e - c*d*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)), x] +
 Dist[((2*p + 3)*(c*d^2 + a*e^2))/(2*a*c*(p + 1)), Int[(d + e*x)^(m - 2)*(a
 + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0
] && EqQ[m + 2*p + 2, 0] && LtQ[p, -1]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^2(c+dx)(a+b\tan(c+dx))^2\,dx=\frac{\text{Subst}\left(\int \frac{(a+x)^2}{\left(1+\frac{x^2}{b^2}\right)^2}\,dx,x,b\tan(c+dx)\right)}{bd}$$

$$=-\frac{\cos^2(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))}{2d}+\frac{\left(a^2+b^2\right)\text{Subst}\Bigg(}{}$$

$$=\frac{1}{2}\left(a^2+b^2\right)x-\frac{\cos^2(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))}{2d}$$

Mathematica [A] time = 0.13, size = 52, normalized size = 1.06

$$\frac{2(a^2+b^2)(c+dx)+(a^2-b^2)\sin(2(c+dx))-2ab\cos(2(c+dx))}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (2*(a^2 + b^2)*(c + d*x) - 2*a*b*Cos[2*(c + d*x)] + (a^2 - b^2)*Sin[2*(c +
d*x)])/(4*d)
```

fricas [A] time = 0.57, size = 52, normalized size = 1.06

$$-\frac{2\,ab\cos(dx+c)^2-(a^2+b^2)dx-(a^2-b^2)\cos(dx+c)\sin(dx+c)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -1/2*(2*a*b*cos(d*x + c)^2 - (a^2 + b^2)*d*x - (a^2 - b^2)*cos(d*x + c)*sin
(d*x + c))/d
```

giac [B] time = 2.06, size = 245, normalized size = 5.00

$$a^2dx\tan(dx)^2\tan(c)^2+b^2dx\tan(dx)^2\tan(c)^2+a^2dx\tan(dx)^2+b^2dx\tan(dx)^2+a^2dx\tan(c)^2+b^2dx\tan(c)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/2*(a^2*d*x*tan(d*x)^2*tan(c)^2 + b^2*d*x*tan(d*x)^2*tan(c)^2 + a^2*d*x*ta
n(d*x)^2 + b^2*d*x*tan(d*x)^2 + a^2*d*x*tan(c)^2 + b^2*d*x*tan(c)^2 - a*b*t
an(d*x)^2*tan(c)^2 - a^2*tan(d*x)^2*tan(c) + b^2*tan(d*x)^2*tan(c) - a^2*ta
n(d*x)*tan(c)^2 + b^2*tan(d*x)*tan(c)^2 + a^2*d*x + b^2*d*x + a*b*tan(d*x)^
2 + 4*a*b*tan(d*x)*tan(c) + a*b*tan(c)^2 + a^2*tan(d*x) - b^2*tan(d*x) + a^
2*tan(c) - b^2*tan(c) - a*b)/(d*tan(d*x)^2*tan(c)^2 + d*tan(d*x)^2 + d*tan(
c)^2 + d)
```

maple [A] time = 0.30, size = 70, normalized size = 1.43

$$\frac{b^2\left(-\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)-\left(\cos^2(dx+c)\right)ab+a^2\left(\frac{\cos(dx+c)\sin(dx+c)}{2}+\frac{dx}{2}+\frac{c}{2}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2*(a+b*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(b^2*(-1/2*cos(d*x+c)*sin(d*x+c)+1/2*d*x+1/2*c)-cos(d*x+c)^2*a*b+a^2*(1
/2*cos(d*x+c)*sin(d*x+c)+1/2*d*x+1/2*c))
```

maxima [A] time = 0.43, size = 55, normalized size = 1.12

$$\frac{(a^2+b^2)(dx+c)-\frac{2\,ab-(a^2-b^2)\tan(dx+c)}{\tan(dx+c)^2+1}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/2*((a^2 + b^2)*(d*x + c) - (2*a*b - (a^2 - b^2)*tan(d*x + c))/(tan(d*x +
c)^2 + 1))/d
```

mupad [B] time = 3.58, size = 50, normalized size = 1.02

$$x\left(\frac{a^2}{2}+\frac{b^2}{2}\right)-\frac{\cos\left(c+d\,x\right)^2\,\left(a\,b-\tan\left(c+d\,x\right)\,\left(\frac{a^2}{2}-\frac{b^2}{2}\right)\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2*(a + b*tan(c + d*x))^2,x)
[Out] x*(a^2/2 + b^2/2) - (cos(c + d*x)^2*(a*b - tan(c + d*x)*(a^2/2 - b^2/2)))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int(a+b\tan(c+dx))^2\cos^2(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2*(a+b*tan(d*x+c))**2,x)
[Out] Integral((a + b*tan(c + d*x))**2*cos(c + d*x)**2, x)
```

3.522 $\int \cos^4(c+dx)(a+b\tan(c+dx))^2\,dx$

Optimal. Leaf size=88

$$-\frac{\cos^2(c+dx)\left(2ab-\left(3a^2+b^2\right)\tan(c+dx)\right)}{8d}+\frac{1}{8}x\left(3a^2+b^2\right)-\frac{\cos^4(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))}{4d}$$

```
[Out] 1/8*(3*a^2+b^2)*x-1/4*cos(d*x+c)^4*(b-a*tan(d*x+c))*(a+b*tan(d*x+c))/d-1/8*
cos(d*x+c)^2*(2*a*b-(3*a^2+b^2)*tan(d*x+c))/d
```

Rubi [A] time = 0.08, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {3506, 739, 639, 203}

$$-\frac{\cos^2(c+dx)\left(2ab-\left(3a^2+b^2\right)\tan(c+dx)\right)}{8d}+\frac{1}{8}x\left(3a^2+b^2\right)-\frac{\cos^4(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))}{4d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] ((3*a^2 + b^2)*x)/8 - (Cos[c + d*x]^4*(b - a*Tan[c + d*x])*(a + b*Tan[c + d
*x]))/(4*d) - (Cos[c + d*x]^2*(2*a*b - (3*a^2 + b^2)*Tan[c + d*x]))/(8*d)
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 639

```
Int[((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[((a*e
 - c*d*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)), x] + Dist[(d*(2*p + 3))/(2*
a*(p + 1)), Int[(a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e}, x] && Lt
Q[p, -1] && NeQ[p, -3/2]
```

Rule 739

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m - 1)*(a*e - c*d*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)), x] +
 Dist[1/((p + 1)*(-2*a*c)), Int[(d + e*x)^(m - 2)*Simp[a*e^2*(m - 1) - c*d^
2*(2*p + 3) - d*c*e*(m + 2*p + 2)*x, x]*(a + c*x^2)^(p + 1), x], x] /; Free
Q[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && I
ntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^4(c+dx)(a+b\tan(c+dx))^2\,dx = \frac{\text{Subst}\left(\int \frac{(a+x)^2}{\left(1+\frac{x^2}{b^2}\right)^3}\,dx, x, b\tan(c+dx)\right)}{bd}$$

$$= -\frac{\cos^4(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))}{4d} + \frac{b\,\text{Subst}\left(\int \frac{1+\frac{3a^2}{b^2}+}{\left(1+\frac{x^2}{b^2}\right.}\right.}{}$$

$$= -\frac{\cos^4(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))}{4d} - \frac{\cos^2(c+dx)\left(2ab\right.}{}$$

$$= \frac{1}{8}\left(3a^2+b^2\right)x - \frac{\cos^4(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))}{4d} - \frac{\text{cc}}{}$$

Mathematica [B] time = 2.98, size = 216, normalized size = 2.45

$$\frac{4\left(a^2+b^2\right)\cos^4(c+dx)(a\tan(c+dx)+b)(a+b\tan(c+dx))^3 + \frac{\left(3a^2+b^2\right)\left(-\sqrt{-b^2}\left(b^4-a^4\right)\sin(2(c+dx))-2ab\sqrt{-b^2}\left(a^2+b^2\right)\cos(2\right.}{}}{16d\left(a^2+b^2\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (((3*a^2 + b^2)*(2*a*b*Sqrt[-b^2]*(2*a^2 + b^2) - 2*a*b*Sqrt[-b^2]*(a^2 + b
^2)*Cos[2*(c + d*x)] + b*(a^2 + b^2)^2*Log[Sqrt[-b^2] - b*Tan[c + d*x]] - b
*(a^2 + b^2)^2*Log[Sqrt[-b^2] + b*Tan[c + d*x]] - Sqrt[-b^2]*(-a^4 + b^4)*S
in[2*(c + d*x)]))/Sqrt[-b^2] + 4*(a^2 + b^2)*Cos[c + d*x]^4*(b + a*Tan[c +
d*x])*(a + b*Tan[c + d*x])^3)/(16*(a^2 + b^2)^2*d)
```

fricas [A] time = 0.55, size = 75, normalized size = 0.85

$$-\frac{4\,ab\cos\left(dx+c\right)^4 - \left(3\,a^2+b^2\right)dx - \left(2\left(a^2-b^2\right)\cos\left(dx+c\right)^3 + \left(3\,a^2+b^2\right)\cos\left(dx+c\right)\right)\sin\left(dx+c\right)}{8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -1/8*(4*a*b*cos(d*x + c)^4 - (3*a^2 + b^2)*d*x - (2*(a^2 - b^2)*cos(d*x + c
)^3 + (3*a^2 + b^2)*cos(d*x + c))*sin(d*x + c))/d
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError >> Unable to parse Giac output: Unabl
e to check sign: (2*pi/x/2)>(-2*pi/x/2)Unable to check sign: (2*pi/x/2)>(-2
*pi/x/2)Unable to check sign: (2*pi/x/2)>(-2*pi/x/2)Unable to check sign: (
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```

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check sign: (2*pi/x/2)>(-2*pi/x/2)Unable to check sign: (2*pi/x/2)>(-2*pi/
x/2)(24*a^2*d*x*tan(c)^4*tan(d*x)^4+48*a^2*d*x*tan(c)^4*tan(d*x)^2+24*a^2*d
*x*tan(c)^4+48*a^2*d*x*tan(c)^2*tan(d*x)^4+96*a^2*d*x*tan(c)^2*tan(d*x)^2+4
8*a^2*d*x*tan(c)^2+24*a^2*d*x*tan(d*x)^4+48*a^2*d*x*tan(d*x)^2+24*a^2*d*x-4
0*a^2*tan(c)^4*tan(d*x)^3-24*a^2*tan(c)^4*tan(d*x)-40*a^2*tan(c)^3*tan(d*x)
^4+48*a^2*tan(c)^3*tan(d*x)^2+24*a^2*tan(c)^3+48*a^2*tan(c)^2*tan(d*x)^3-48
*a^2*tan(c)^2*tan(d*x)-24*a^2*tan(c)*tan(d*x)^4-48*a^2*tan(c)*tan(d*x)^2+40
*a^2*tan(c)+24*a^2*tan(d*x)^3+40*a^2*tan(d*x)-20*a*b*tan(c)^4*tan(d*x)^4+24
*a*b*tan(c)^4*tan(d*x)^2+12*a*b*tan(c)^4+128*a*b*tan(c)^3*tan(d*x)^3+24*a*b
*tan(c)^2*tan(d*x)^4-144*a*b*tan(c)^2*tan(d*x)^2+24*a*b*tan(c)^2+128*a*b*ta
n(c)*tan(d*x)+12*a*b*tan(d*x)^4+24*a*b*tan(d*x)^2-20*a*b+8*b^2*d*x*tan(c)^4
*tan(d*x)^4+16*b^2*d*x*tan(c)^4*tan(d*x)^2+8*b^2*d*x*tan(c)^4+16*b^2*d*x*ta
n(c)^2*tan(d*x)^4+32*b^2*d*x*tan(c)^2*tan(d*x)^2+16*b^2*d*x*tan(c)^2+8*b^2*
d*x*tan(d*x)^4+16*b^2*d*x*tan(d*x)^2+8*b^2*d*x+3*b^2*pi*sign(2*tan(c)^2*tan
(d*x)-2*tan(c)*tan(d*x)^2-2*tan(c)+2*tan(d*x))*sign(2*tan(c)^2*tan(d*x)^2-2
)*tan(c)^4*tan(d*x)^4+6*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^2
-2*tan(c)+2*tan(d*x))*sign(2*tan(c)^2*tan(d*x)^2-2)*tan(c)^4*tan(d*x)^2+3*b
^2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^2-2*tan(c)+2*tan(d*x))*sig
n(2*tan(c)^2*tan(d*x)^2-2)*tan(c)^4+6*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan
(c)*tan(d*x)^2-2*tan(c)+2*tan(d*x))*sign(2*tan(c)^2*tan(d*x)^2-2)*tan(c)^2*
tan(d*x)^4+12*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^2-2*tan(c)+
2*tan(d*x))*sign(2*tan(c)^2*tan(d*x)^2-2)*tan(c)^2*tan(d*x)^2+6*b^2*pi*sign
(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^2-2*tan(c)+2*tan(d*x))*sign(2*tan(c)
^2*tan(d*x)^2-2)*tan(c)^2+3*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*
x)^2-2*tan(c)+2*tan(d*x))*sign(2*tan(c)^2*tan(d*x)^2-2)*tan(d*x)^4+6*b^2*pi
*sign(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^2-2*tan(c)+2*tan(d*x))*sign(2*t
an(c)^2*tan(d*x)^2-2)*tan(d*x)^2+3*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan(c)
*tan(d*x)^2-2*tan(c)+2*tan(d*x))*sign(2*tan(c)^2*tan(d*x)^2-2)+3*b^2*pi*sig
n(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^2-2*tan(c)+2*tan(d*x))*tan(c)^4*tan
(d*x)^4+6*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^2-2*tan(c)+2*ta
n(d*x))*tan(c)^4*tan(d*x)^2+3*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(
d*x)^2-2*tan(c)+2*tan(d*x))*tan(c)^4+6*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*ta
n(c)*tan(d*x)^2-2*tan(c)+2*tan(d*x))*tan(c)^2*tan(d*x)^4+12*b^2*pi*sign(2*t
an(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^2-2*tan(c)+2*tan(d*x))*tan(c)^2*tan(d*x)
^2+6*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^2-2*tan(c)+2*tan(d*x
))*tan(c)^2+3*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^2-2*tan(c)+
2*tan(d*x))*tan(d*x)^4+6*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^
2-2*tan(c)+2*tan(d*x))*tan(d*x)^2+3*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan(c
)*tan(d*x)^2-2*tan(c)+2*tan(d*x))+6*b^2*atan((tan(c)+tan(d*x))/(tan(c)*tan(
d*x)-1))*tan(c)^4*tan(d*x)^4+12*b^2*atan((tan(c)+tan(d*x))/(tan(c)*tan(d*x)
-1))*tan(c)^4*tan(d*x)^2+6*b^2*atan((tan(c)+tan(d*x))/(tan(c)*tan(d*x)-1))*
tan(c)^4+12*b^2*atan((tan(c)+tan(d*x))/(tan(c)*tan(d*x)-1))*tan(c)^2*tan(d*
x)^4+24*b^2*atan((tan(c)+tan(d*x))/(tan(c)*tan(d*x)-1))*tan(c)^2*tan(d*x)^2

```
+12*b^2*atan((tan(c)+tan(d*x))/(tan(c)*tan(d*x)-1))*tan(c)^2+6*b^2*atan((ta
n(c)+tan(d*x))/(tan(c)*tan(d*x)-1))*tan(d*x)^4+12*b^2*atan((tan(c)+tan(d*x)
)/(tan(c)*tan(d*x)-1))*tan(d*x)^2+6*b^2*atan((tan(c)+tan(d*x))/(tan(c)*tan(
d*x)-1))-6*b^2*atan((tan(c)-tan(d*x))/(tan(c)*tan(d*x)+1))*tan(c)^4*tan(d*x
)^4-12*b^2*atan((tan(c)-tan(d*x))/(tan(c)*tan(d*x)+1))*tan(c)^4*tan(d*x)^2-
6*b^2*atan((tan(c)-tan(d*x))/(tan(c)*tan(d*x)+1))*tan(c)^4-12*b^2*atan((tan
(c)-tan(d*x))/(tan(c)*tan(d*x)+1))*tan(c)^2*tan(d*x)^4-24*b^2*atan((tan(c)-
tan(d*x))/(tan(c)*tan(d*x)+1))*tan(c)^2*tan(d*x)^2-12*b^2*atan((tan(c)-tan(
d*x))/(tan(c)*tan(d*x)+1))*tan(c)^2-6*b^2*atan((tan(c)-tan(d*x))/(tan(c)*ta
n(d*x)+1))*tan(d*x)^4-12*b^2*atan((tan(c)-tan(d*x))/(tan(c)*tan(d*x)+1))*ta
n(d*x)^2-6*b^2*atan((tan(c)-tan(d*x))/(tan(c)*tan(d*x)+1))+8*b^2*tan(c)^4*t
an(d*x)^3-8*b^2*tan(c)^4*tan(d*x)+8*b^2*tan(c)^3*tan(d*x)^4-48*b^2*tan(c)^3
*tan(d*x)^2+8*b^2*tan(c)^3-48*b^2*tan(c)^2*tan(d*x)^3+48*b^2*tan(c)^2*tan(d
*x)-8*b^2*tan(c)*tan(d*x)^4+48*b^2*tan(c)*tan(d*x)^2-8*b^2*tan(c)+8*b^2*tan
(d*x)^3-8*b^2*tan(d*x))/(64*d*tan(c)^4*tan(d*x)^4+128*d*tan(c)^4*tan(d*x)^2
+64*d*tan(c)^4+128*d*tan(c)^2*tan(d*x)^4+256*d*tan(c)^2*tan(d*x)^2+128*d*ta
n(c)^2+64*d*tan(d*x)^4+128*d*tan(d*x)^2+64*d)
```

maple [A] time = 0.44, size = 97, normalized size = 1.10

$$\frac{b^2\left(-\frac{\left(\cos^3(dx+c)\right)\sin(dx+c)}{4}+\frac{\cos(dx+c)\sin(dx+c)}{8}+\frac{dx}{8}+\frac{c}{8}\right)-\frac{ab\left(\cos^4(dx+c)\right)}{2}+a^2\left(\frac{\left(\cos^3(dx+c)+\frac{3\cos(dx+c)}{2}\right)\sin(dx+c)}{4}+\frac{3dx}{8}+\frac{3c}{8}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4*(a+b*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(b^2*(-1/4*cos(d*x+c)^3*sin(d*x+c)+1/8*cos(d*x+c)*sin(d*x+c)+1/8*d*x+1/
8*c)-1/2*a*b*cos(d*x+c)^4+a^2*(1/4*(cos(d*x+c)^3+3/2*cos(d*x+c))*sin(d*x+c)
+3/8*d*x+3/8*c))
```

maxima [A] time = 0.43, size = 85, normalized size = 0.97

$$\frac{\left(3\,a^2+b^2\right)(dx+c)+\frac{\left(3\,a^2+b^2\right)\tan(dx+c)^3-4\,ab+\left(5\,a^2-b^2\right)\tan(dx+c)}{\tan(dx+c)^4+2\,\tan(dx+c)^2+1}}{8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/8*((3*a^2 + b^2)*(d*x + c) + ((3*a^2 + b^2)*tan(d*x + c)^3 - 4*a*b + (5*a
^2 - b^2)*tan(d*x + c))/(tan(d*x + c)^4 + 2*tan(d*x + c)^2 + 1))/d
```

mupad [B] time = 3.66, size = 83, normalized size = 0.94

$$x\left(\frac{3\,a^2}{8}+\frac{b^2}{8}\right)+\frac{\left(\frac{3\,a^2}{8}+\frac{b^2}{8}\right)\tan\left(c+d\,x\right)^3+\left(\frac{5\,a^2}{8}-\frac{b^2}{8}\right)\tan\left(c+d\,x\right)-\frac{a\,b}{2}}{d\,\left(\tan\left(c+d\,x\right)^4+2\tan\left(c+d\,x\right)^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4*(a + b*tan(c + d*x))^2,x)
```

```
[Out] x*((3*a^2)/8 + b^2/8) + (tan(c + d*x)*((5*a^2)/8 - b^2/8) - (a*b)/2 + tan(c
 + d*x)^3*((3*a^2)/8 + b^2/8))/(d*(2*tan(c + d*x)^2 + tan(c + d*x)^4 + 1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(a+b\tan\left(c+dx\right)\right)^2\cos^4\left(c+dx\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4*(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**2*cos(c + d*x)**4, x)
```

3.523 $\int \sec^7(c+dx)(a+b\tan(c+dx))^2\,dx$

Optimal. Leaf size=163

$$\frac{5\left(8a^2-b^2\right)\tanh^{-1}(\sin(c+dx))}{128d}+\frac{\left(8a^2-b^2\right)\tan(c+dx)\sec^5(c+dx)}{48d}+\frac{5\left(8a^2-b^2\right)\tan(c+dx)\sec^3(c+dx)}{192d}+\frac{5(}{}$$

```
[Out] 5/128*(8*a^2-b^2)*arctanh(sin(d*x+c))/d+9/56*a*b*sec(d*x+c)^7/d+5/128*(8*a^
2-b^2)*sec(d*x+c)*tan(d*x+c)/d+5/192*(8*a^2-b^2)*sec(d*x+c)^3*tan(d*x+c)/d+
1/48*(8*a^2-b^2)*sec(d*x+c)^5*tan(d*x+c)/d+1/8*b*sec(d*x+c)^7*(a+b*tan(d*x+
c))/d
```

Rubi [A] time = 0.13, antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {3508, 3486, 3768, 3770}

$$\frac{5\left(8a^2-b^2\right)\tanh^{-1}(\sin(c+dx))}{128d}+\frac{\left(8a^2-b^2\right)\tan(c+dx)\sec^5(c+dx)}{48d}+\frac{5\left(8a^2-b^2\right)\tan(c+dx)\sec^3(c+dx)}{192d}+\frac{5(}{}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^7*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (5*(8*a^2 - b^2)*ArcTanh[Sin[c + d*x]])/(128*d) + (9*a*b*Sec[c + d*x]^7)/(5
6*d) + (5*(8*a^2 - b^2)*Sec[c + d*x]*Tan[c + d*x])/(128*d) + (5*(8*a^2 - b^
2)*Sec[c + d*x]^3*Tan[c + d*x])/(192*d) + ((8*a^2 - b^2)*Sec[c + d*x]^5*Tan
[c + d*x])/(48*d) + (b*Sec[c + d*x]^7*(a + b*Tan[c + d*x]))/(8*d)
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3508

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^2, x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(
m + 1)), x] + Dist[1/(m + 1), Int[(d*Sec[e + f*x])^m*(a^2*(m + 1) - b^2 + a
*b*(m + 2)*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, m}, x] && NeQ[a^2
 + b^2, 0] && NeQ[m, -1]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \sec^7(c+dx)(a+b\tan(c+dx))^2\,dx = \frac{b\sec^7(c+dx)(a+b\tan(c+dx))}{8d} + \frac{1}{8}\int \sec^7(c+dx)\left(8a^2-b^2+9ab\right.$$
$$= \frac{9ab\sec^7(c+dx)}{56d} + \frac{b\sec^7(c+dx)(a+b\tan(c+dx))}{8d} + \frac{1}{8}\left(8a^2-b^2\right)$$
$$= \frac{9ab\sec^7(c+dx)}{56d} + \frac{\left(8a^2-b^2\right)\sec^5(c+dx)\tan(c+dx)}{48d} + \frac{b\sec^7(c+}{}$$
$$= \frac{9ab\sec^7(c+dx)}{56d} + \frac{5\left(8a^2-b^2\right)\sec^3(c+dx)\tan(c+dx)}{192d} + \frac{\left(8a^2-b^2\right.}{}$$
$$= \frac{9ab\sec^7(c+dx)}{56d} + \frac{5\left(8a^2-b^2\right)\sec(c+dx)\tan(c+dx)}{128d} + \frac{5\left(8a^2-b^2\right.}{}$$
$$= \frac{5\left(8a^2-b^2\right)\tanh^{-1}(\sin(c+dx))}{128d} + \frac{9ab\sec^7(c+dx)}{56d} + \frac{5\left(8a^2-b^2\right)\mathrm{s}}{}$$

Mathematica [A] time = 0.79, size = 131, normalized size = 0.80

$$\frac{105\left(8a^2-b^2\right)\tanh^{-1}(\sin(c+dx)) + 56\left(8a^2-b^2\right)\tan(c+dx)\sec^5(c+dx) + 70\left(8a^2-b^2\right)\tan(c+dx)\sec^3(c}{2688d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^7*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (105*(8*a^2 - b^2)*ArcTanh[Sin[c + d*x]] + 105*(8*a^2 - b^2)*Sec[c + d*x]*T
an[c + d*x] + 70*(8*a^2 - b^2)*Sec[c + d*x]^3*Tan[c + d*x] + 56*(8*a^2 - b^
2)*Sec[c + d*x]^5*Tan[c + d*x] + 48*b*Sec[c + d*x]^7*(16*a + 7*b*Tan[c + d*
x]))/(2688*d)
```

fricas [A] time = 0.75, size = 163, normalized size = 1.00

$$\frac{105\left(8a^2-b^2\right)\cos(dx+c)^8\log(\sin(dx+c)+1) - 105\left(8a^2-b^2\right)\cos(dx+c)^8\log(-\sin(dx+c)+1) + 153}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7*(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/5376*(105*(8*a^2 - b^2)*cos(d*x + c)^8*log(sin(d*x + c) + 1) - 105*(8*a^2
 - b^2)*cos(d*x + c)^8*log(-sin(d*x + c) + 1) + 1536*a*b*cos(d*x + c) + 14*
(15*(8*a^2 - b^2)*cos(d*x + c)^6 + 10*(8*a^2 - b^2)*cos(d*x + c)^4 + 8*(8*a
^2 - b^2)*cos(d*x + c)^2 + 48*b^2)*sin(d*x + c))/(d*cos(d*x + c)^8)
```

giac [B] time = 0.60, size = 437, normalized size = 2.68

$$105\left(8a^2-b^2\right)\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right) - 105\left(8a^2-b^2\right)\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right) + \frac{2\left(1848a^2\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^{1}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7*(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/2688*(105*(8*a^2 - b^2)*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 105*(8*a^2 -
 b^2)*log(abs(tan(1/2*d*x + 1/2*c) - 1)) + 2*(1848*a^2*tan(1/2*d*x + 1/2*c)
^15 + 105*b^2*tan(1/2*d*x + 1/2*c)^15 - 5376*a*b*tan(1/2*d*x + 1/2*c)^14 -
3416*a^2*tan(1/2*d*x + 1/2*c)^13 + 2779*b^2*tan(1/2*d*x + 1/2*c)^13 + 5376*
```

```
a*b*tan(1/2*d*x + 1/2*c)^12 + 6328*a^2*tan(1/2*d*x + 1/2*c)^11 + 6265*b^2*t
an(1/2*d*x + 1/2*c)^11 - 26880*a*b*tan(1/2*d*x + 1/2*c)^10 - 4760*a^2*tan(1
/2*d*x + 1/2*c)^9 + 12355*b^2*tan(1/2*d*x + 1/2*c)^9 + 26880*a*b*tan(1/2*d*
x + 1/2*c)^8 - 4760*a^2*tan(1/2*d*x + 1/2*c)^7 + 12355*b^2*tan(1/2*d*x + 1/
2*c)^7 - 16128*a*b*tan(1/2*d*x + 1/2*c)^6 + 6328*a^2*tan(1/2*d*x + 1/2*c)^5
 + 6265*b^2*tan(1/2*d*x + 1/2*c)^5 + 16128*a*b*tan(1/2*d*x + 1/2*c)^4 - 341
6*a^2*tan(1/2*d*x + 1/2*c)^3 + 2779*b^2*tan(1/2*d*x + 1/2*c)^3 - 768*a*b*ta
n(1/2*d*x + 1/2*c)^2 + 1848*a^2*tan(1/2*d*x + 1/2*c) + 105*b^2*tan(1/2*d*x
+ 1/2*c) + 768*a*b)/(tan(1/2*d*x + 1/2*c)^2 - 1)^8)/d
```

maple [A] time = 0.45, size = 235, normalized size = 1.44

$$\frac{a^2\tan(dx+c)\left(\sec^5(dx+c)\right)}{6d}+\frac{5a^2\left(\sec^3(dx+c)\right)\tan(dx+c)}{24d}+\frac{5a^2\sec(dx+c)\tan(dx+c)}{16d}+\frac{5a^2\ln(\sec(dx+c)}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^7*(a+b*tan(d*x+c))^2,x)
```

```
[Out] 1/6/d*a^2*tan(d*x+c)*sec(d*x+c)^5+5/24*a^2*sec(d*x+c)^3*tan(d*x+c)/d+5/16*a
^2*sec(d*x+c)*tan(d*x+c)/d+5/16/d*a^2*ln(sec(d*x+c)+tan(d*x+c))+2/7/d*a*b/c
os(d*x+c)^7+1/8/d*b^2*sin(d*x+c)^3/cos(d*x+c)^8+5/48/d*b^2*sin(d*x+c)^3/cos
(d*x+c)^6+5/64/d*b^2*sin(d*x+c)^3/cos(d*x+c)^4+5/128/d*b^2*sin(d*x+c)^3/cos
(d*x+c)^2+5/128*b^2*sin(d*x+c)/d-5/128/d*b^2*ln(sec(d*x+c)+tan(d*x+c))
```

maxima [A] time = 0.35, size = 220, normalized size = 1.35

$$\frac{7\,b^2\left(\frac{2\left(15\,\sin(dx+c)^7-55\,\sin(dx+c)^5+73\,\sin(dx+c)^3+15\,\sin(dx+c)\right)}{\sin(dx+c)^8-4\,\sin(dx+c)^6+6\,\sin(dx+c)^4-4\,\sin(dx+c)^2+1}-15\,\log(\sin(dx+c)+1)+15\,\log(\sin(dx+c)-1)\right)-56}{5376\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7*(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/5376*(7*b^2*(2*(15*sin(d*x + c)^7 - 55*sin(d*x + c)^5 + 73*sin(d*x + c)^3
 + 15*sin(d*x + c))/(sin(d*x + c)^8 - 4*sin(d*x + c)^6 + 6*sin(d*x + c)^4 -
 4*sin(d*x + c)^2 + 1) - 15*log(sin(d*x + c) + 1) + 15*log(sin(d*x + c) - 1
)) - 56*a^2*(2*(15*sin(d*x + c)^5 - 40*sin(d*x + c)^3 + 33*sin(d*x + c))/(s
in(d*x + c)^6 - 3*sin(d*x + c)^4 + 3*sin(d*x + c)^2 - 1) - 15*log(sin(d*x +
 c) + 1) + 15*log(sin(d*x + c) - 1)) + 1536*a*b/cos(d*x + c)^7)/d
```

mupad [B] time = 7.10, size = 432, normalized size = 2.65

$$\frac{\operatorname{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)\left(\frac{5\,a^2}{8}-\frac{5\,b^2}{64}\right)}{d}+\frac{\left(\frac{11\,a^2}{8}+\frac{5\,b^2}{64}\right)\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{15}-4\,a\,b\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{14}+\left(\frac{397\,b^2}{192}-\frac{61\,a^2}{24}\right)\tan\left(\frac{c}{2}+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))^2/cos(c + d*x)^7,x)
```

```
[Out] (atanh(tan(c/2 + (d*x)/2))*((5*a^2)/8 - (5*b^2)/64))/d + ((4*a*b)/7 + tan(c
/2 + (d*x)/2)^15*((11*a^2)/8 + (5*b^2)/64) - tan(c/2 + (d*x)/2)^3*((61*a^2)
/24 - (397*b^2)/192) - tan(c/2 + (d*x)/2)^13*((61*a^2)/24 - (397*b^2)/192)
+ tan(c/2 + (d*x)/2)^5*((113*a^2)/24 + (895*b^2)/192) + tan(c/2 + (d*x)/2)^
11*((113*a^2)/24 + (895*b^2)/192) - tan(c/2 + (d*x)/2)^7*((85*a^2)/24 - (17
65*b^2)/192) - tan(c/2 + (d*x)/2)^9*((85*a^2)/24 - (1765*b^2)/192) + tan(c/
2 + (d*x)/2)*((11*a^2)/8 + (5*b^2)/64) - (4*a*b*tan(c/2 + (d*x)/2)^2)/7 + 1
2*a*b*tan(c/2 + (d*x)/2)^4 - 12*a*b*tan(c/2 + (d*x)/2)^6 + 20*a*b*tan(c/2 +
```

```
 (d*x)/2)^8 - 20*a*b*tan(c/2 + (d*x)/2)^10 + 4*a*b*tan(c/2 + (d*x)/2)^12 -
4*a*b*tan(c/2 + (d*x)/2)^14)/(d*(28*tan(c/2 + (d*x)/2)^4 - 8*tan(c/2 + (d*x
)/2)^2 - 56*tan(c/2 + (d*x)/2)^6 + 70*tan(c/2 + (d*x)/2)^8 - 56*tan(c/2 + (
d*x)/2)^10 + 28*tan(c/2 + (d*x)/2)^12 - 8*tan(c/2 + (d*x)/2)^14 + tan(c/2 +
 (d*x)/2)^16 + 1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a + b\tan(c + dx))^2 \sec^7(c + dx)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**7*(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**2*sec(c + d*x)**7, x)
```

3.524 $\int \sec^5(c+dx)(a+b\tan(c+dx))^2\,dx$

Optimal. Leaf size=131

$$\frac{(6a^2-b^2)\tanh^{-1}(\sin(c+dx))}{16d}+\frac{(6a^2-b^2)\tan(c+dx)\sec^3(c+dx)}{24d}+\frac{(6a^2-b^2)\tan(c+dx)\sec(c+dx)}{16d}+\frac{7ab\sec}{3}$$

```
[Out] 1/16*(6*a^2-b^2)*arctanh(sin(d*x+c))/d+7/30*a*b*sec(d*x+c)^5/d+1/16*(6*a^2-
b^2)*sec(d*x+c)*tan(d*x+c)/d+1/24*(6*a^2-b^2)*sec(d*x+c)^3*tan(d*x+c)/d+1/6
*b*sec(d*x+c)^5*(a+b*tan(d*x+c))/d
```

Rubi [A] time = 0.12, antiderivative size = 131, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {3508, 3486, 3768, 3770}

$$\frac{(6a^2-b^2)\tanh^{-1}(\sin(c+dx))}{16d}+\frac{(6a^2-b^2)\tan(c+dx)\sec^3(c+dx)}{24d}+\frac{(6a^2-b^2)\tan(c+dx)\sec(c+dx)}{16d}+\frac{7ab\sec}{3}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^5*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] ((6*a^2 - b^2)*ArcTanh[Sin[c + d*x]])/(16*d) + (7*a*b*Sec[c + d*x]^5)/(30*d
) + ((6*a^2 - b^2)*Sec[c + d*x]*Tan[c + d*x])/(16*d) + ((6*a^2 - b^2)*Sec[c
 + d*x]^3*Tan[c + d*x])/(24*d) + (b*Sec[c + d*x]^5*(a + b*Tan[c + d*x]))/(6
*d)
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3508

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^2, x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(
m + 1)), x] + Dist[1/(m + 1), Int[(d*Sec[e + f*x])^m*(a^2*(m + 1) - b^2 + a
*b*(m + 2)*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, m}, x] && NeQ[a^2
 + b^2, 0] && NeQ[m, -1]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \sec^5(c+dx)(a+b\tan(c+dx))^2\,dx = \frac{b\sec^5(c+dx)(a+b\tan(c+dx))}{6d} + \frac{1}{6}\int \sec^5(c+dx)\left(6a^2-b^2+7ab\right.$$
$$= \frac{7ab\sec^5(c+dx)}{30d} + \frac{b\sec^5(c+dx)(a+b\tan(c+dx))}{6d} + \frac{1}{6}\left(6a^2-b^2\right)$$
$$= \frac{7ab\sec^5(c+dx)}{30d} + \frac{\left(6a^2-b^2\right)\sec^3(c+dx)\tan(c+dx)}{24d} + \frac{b\sec^5(c+}{}$$
$$= \frac{7ab\sec^5(c+dx)}{30d} + \frac{\left(6a^2-b^2\right)\sec(c+dx)\tan(c+dx)}{16d} + \frac{\left(6a^2-b^2\right)s}{}$$
$$= \frac{\left(6a^2-b^2\right)\tanh^{-1}(\sin(c+dx))}{16d} + \frac{7ab\sec^5(c+dx)}{30d} + \frac{\left(6a^2-b^2\right)\sec(}{}$$

Mathematica [A] time = 0.53, size = 104, normalized size = 0.79

$$\frac{15\left(6a^2-b^2\right)\tanh^{-1}(\sin(c+dx)) + 10\left(6a^2-b^2\right)\tan(c+dx)\sec^3(c+dx) + 15\left(6a^2-b^2\right)\tan(c+dx)\sec(c+}{240d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^5*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (15*(6*a^2 - b^2)*ArcTanh[Sin[c + d*x]] + 15*(6*a^2 - b^2)*Sec[c + d*x]*Tan
[c + d*x] + 10*(6*a^2 - b^2)*Sec[c + d*x]^3*Tan[c + d*x] + 8*b*Sec[c + d*x]
^5*(12*a + 5*b*Tan[c + d*x]))/(240*d)
```

fricas [A] time = 0.84, size = 142, normalized size = 1.08

$$\frac{15\left(6a^2-b^2\right)\cos(dx+c)^6\log(\sin(dx+c)+1) - 15\left(6a^2-b^2\right)\cos(dx+c)^6\log(-\sin(dx+c)+1) + 192\,ab}{480\,d\cos(dx+c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/480*(15*(6*a^2 - b^2)*cos(d*x + c)^6*log(sin(d*x + c) + 1) - 15*(6*a^2 -
b^2)*cos(d*x + c)^6*log(-sin(d*x + c) + 1) + 192*a*b*cos(d*x + c) + 10*(3*(
6*a^2 - b^2)*cos(d*x + c)^4 + 2*(6*a^2 - b^2)*cos(d*x + c)^2 + 8*b^2)*sin(d
*x + c))/(d*cos(d*x + c)^6)
```

giac [B] time = 0.57, size = 343, normalized size = 2.62

$$15\left(6a^2-b^2\right)\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right) - 15\left(6a^2-b^2\right)\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right) + \frac{2\left(150a^2\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^{11}+1\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/240*(15*(6*a^2 - b^2)*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 15*(6*a^2 - b^
2)*log(abs(tan(1/2*d*x + 1/2*c) - 1)) + 2*(150*a^2*tan(1/2*d*x + 1/2*c)^11
+ 15*b^2*tan(1/2*d*x + 1/2*c)^11 - 480*a*b*tan(1/2*d*x + 1/2*c)^10 - 210*a^
2*tan(1/2*d*x + 1/2*c)^9 + 235*b^2*tan(1/2*d*x + 1/2*c)^9 + 480*a*b*tan(1/2
*d*x + 1/2*c)^8 + 60*a^2*tan(1/2*d*x + 1/2*c)^7 + 390*b^2*tan(1/2*d*x + 1/2
*c)^7 - 960*a*b*tan(1/2*d*x + 1/2*c)^6 + 60*a^2*tan(1/2*d*x + 1/2*c)^5 + 39
0*b^2*tan(1/2*d*x + 1/2*c)^5 + 960*a*b*tan(1/2*d*x + 1/2*c)^4 - 210*a^2*tan
```

```
(1/2*d*x + 1/2*c)^3 + 235*b^2*tan(1/2*d*x + 1/2*c)^3 - 96*a*b*tan(1/2*d*x +
 1/2*c)^2 + 150*a^2*tan(1/2*d*x + 1/2*c) + 15*b^2*tan(1/2*d*x + 1/2*c) + 96
*a*b)/(tan(1/2*d*x + 1/2*c)^2 - 1)^6)/d
```

maple [A] time = 0.42, size = 189, normalized size = 1.44

$$\frac{a^2\left(\sec^3(dx+c)\right)\tan(dx+c)}{4d}+\frac{3a^2\sec(dx+c)\tan(dx+c)}{8d}+\frac{3a^2\ln(\sec(dx+c)+\tan(dx+c))}{8d}+\frac{2ab}{5d\cos(dx+c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^5*(a+b*tan(d*x+c))^2,x)
```

```
[Out] 1/4*a^2*sec(d*x+c)^3*tan(d*x+c)/d+3/8*a^2*sec(d*x+c)*tan(d*x+c)/d+3/8/d*a^2
*ln(sec(d*x+c)+tan(d*x+c))+2/5/d*a*b/cos(d*x+c)^5+1/6/d*b^2*sin(d*x+c)^3/co
s(d*x+c)^6+1/8/d*b^2*sin(d*x+c)^3/cos(d*x+c)^4+1/16/d*b^2*sin(d*x+c)^3/cos(
d*x+c)^2+1/16*b^2*sin(d*x+c)/d-1/16/d*b^2*ln(sec(d*x+c)+tan(d*x+c))
```

maxima [A] time = 0.35, size = 180, normalized size = 1.37

$$\frac{5\,b^2\left(\frac{2\left(3\,\sin(dx+c)^5-8\,\sin(dx+c)^3-3\,\sin(dx+c)\right)}{\sin(dx+c)^6-3\,\sin(dx+c)^4+3\,\sin(dx+c)^2-1}-3\,\log\left(\sin(dx+c)+1\right)+3\,\log\left(\sin(dx+c)-1\right)\right)-30\,a^2\left(\frac{2\left(3\,\sin(dx+c)^3-\right.}{\sin(dx+c)^4-2\,\mathrm{s}}\right.}{480\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/480*(5*b^2*(2*(3*sin(d*x + c)^5 - 8*sin(d*x + c)^3 - 3*sin(d*x + c))/(sin
(d*x + c)^6 - 3*sin(d*x + c)^4 + 3*sin(d*x + c)^2 - 1) - 3*log(sin(d*x + c)
 + 1) + 3*log(sin(d*x + c) - 1)) - 30*a^2*(2*(3*sin(d*x + c)^3 - 5*sin(d*x
+ c))/(sin(d*x + c)^4 - 2*sin(d*x + c)^2 + 1) - 3*log(sin(d*x + c) + 1) + 3
*log(sin(d*x + c) - 1)) + 192*a*b/cos(d*x + c)^5)/d
```

mupad [B] time = 6.38, size = 328, normalized size = 2.50

$$\frac{\left(\frac{5\,a^2}{4}+\frac{b^2}{8}\right)\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{11}-4\,a\,b\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{10}+\left(\frac{47\,b^2}{24}-\frac{7\,a^2}{4}\right)\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^9+4\,a\,b\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8+\left(\frac{a^2}{2}+\frac{13\,b^2}{4}\right.}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^{12}-6\tan\left(\frac{c}{2}+\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))^2/cos(c + d*x)^5,x)
```

```
[Out] ((4*a*b)/5 + tan(c/2 + (d*x)/2)^5*(a^2/2 + (13*b^2)/4) + tan(c/2 + (d*x)/2)
^7*(a^2/2 + (13*b^2)/4) + tan(c/2 + (d*x)/2)^11*((5*a^2)/4 + b^2/8) - tan(c
/2 + (d*x)/2)^3*((7*a^2)/4 - (47*b^2)/24) - tan(c/2 + (d*x)/2)^9*((7*a^2)/4
 - (47*b^2)/24) + tan(c/2 + (d*x)/2)*((5*a^2)/4 + b^2/8) - (4*a*b*tan(c/2 +
 (d*x)/2)^2)/5 + 8*a*b*tan(c/2 + (d*x)/2)^4 - 8*a*b*tan(c/2 + (d*x)/2)^6 +
4*a*b*tan(c/2 + (d*x)/2)^8 - 4*a*b*tan(c/2 + (d*x)/2)^10)/(d*(15*tan(c/2 +
(d*x)/2)^4 - 6*tan(c/2 + (d*x)/2)^2 - 20*tan(c/2 + (d*x)/2)^6 + 15*tan(c/2
+ (d*x)/2)^8 - 6*tan(c/2 + (d*x)/2)^10 + tan(c/2 + (d*x)/2)^12 + 1)) + (ata
nh(tan(c/2 + (d*x)/2))*((3*a^2)/4 - b^2/8))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+b\tan(c+dx))^2\sec^5(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**5*(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**2*sec(c + d*x)**5, x)
```

3.525 $\int \sec^3(c+dx)(a+b\tan(c+dx))^2\,dx$

Optimal. Leaf size=99

$$\frac{(4a^2-b^2)\tanh^{-1}(\sin(c+dx))}{8d}+\frac{(4a^2-b^2)\tan(c+dx)\sec(c+dx)}{8d}+\frac{5ab\sec^3(c+dx)}{12d}+\frac{b\sec^3(c+dx)(a+b\tan(c+dx))}{4d}$$

```
[Out] 1/8*(4*a^2-b^2)*arctanh(sin(d*x+c))/d+5/12*a*b*sec(d*x+c)^3/d+1/8*(4*a^2-b^
2)*sec(d*x+c)*tan(d*x+c)/d+1/4*b*sec(d*x+c)^3*(a+b*tan(d*x+c))/d
```

Rubi [A] time = 0.10, antiderivative size = 99, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {3508, 3486, 3768, 3770}

$$\frac{(4a^2-b^2)\tanh^{-1}(\sin(c+dx))}{8d}+\frac{(4a^2-b^2)\tan(c+dx)\sec(c+dx)}{8d}+\frac{5ab\sec^3(c+dx)}{12d}+\frac{b\sec^3(c+dx)(a+b\tan(c+dx))}{4d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] ((4*a^2 - b^2)*ArcTanh[Sin[c + d*x]])/(8*d) + (5*a*b*Sec[c + d*x]^3)/(12*d)
 + ((4*a^2 - b^2)*Sec[c + d*x]*Tan[c + d*x])/(8*d) + (b*Sec[c + d*x]^3*(a +
 b*Tan[c + d*x]))/(4*d)
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3508

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^2, x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(
m + 1)), x] + Dist[1/(m + 1), Int[(d*Sec[e + f*x])^m*(a^2*(m + 1) - b^2 + a
*b*(m + 2)*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, m}, x] && NeQ[a^2
 + b^2, 0] && NeQ[m, -1]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \sec^3(c+dx)(a+b\tan(c+dx))^2\,dx = \frac{b\sec^3(c+dx)(a+b\tan(c+dx))}{4d} + \frac{1}{4}\int \sec^3(c+dx)\left(4a^2-b^2+5ab\tan\right.$$
$$= \frac{5ab\sec^3(c+dx)}{12d} + \frac{b\sec^3(c+dx)(a+b\tan(c+dx))}{4d} + \frac{1}{4}\left(4a^2-b^2\right)\int \mathrm{s}$$
$$= \frac{5ab\sec^3(c+dx)}{12d} + \frac{\left(4a^2-b^2\right)\sec(c+dx)\tan(c+dx)}{8d} + \frac{b\sec^3(c+dx)(}{}$$
$$= \frac{\left(4a^2-b^2\right)\tanh^{-1}(\sin(c+dx))}{8d} + \frac{5ab\sec^3(c+dx)}{12d} + \frac{\left(4a^2-b^2\right)\sec(c+}{8d}$$

Mathematica [A] time = 0.06, size = 120, normalized size = 1.21

$$\frac{a^2\tanh^{-1}(\sin(c+dx))}{2d}+\frac{a^2\tan(c+dx)\sec(c+dx)}{2d}+\frac{2ab\sec^3(c+dx)}{3d}-\frac{b^2\tanh^{-1}(\sin(c+dx))}{8d}+\frac{b^2\tan(c+dx)\mathrm{se}}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^3*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (a^2*ArcTanh[Sin[c + d*x]])/(2*d) - (b^2*ArcTanh[Sin[c + d*x]])/(8*d) + (2*
a*b*Sec[c + d*x]^3)/(3*d) + (a^2*Sec[c + d*x]*Tan[c + d*x])/(2*d) - (b^2*Se
c[c + d*x]*Tan[c + d*x])/(8*d) + (b^2*Sec[c + d*x]^3*Tan[c + d*x])/(4*d)
```

fricas [A] time = 0.63, size = 120, normalized size = 1.21

$$\frac{3\left(4\,a^2-b^2\right)\cos\left(dx+c\right)^4\log\left(\sin\left(dx+c\right)+1\right)-3\left(4\,a^2-b^2\right)\cos\left(dx+c\right)^4\log\left(-\sin\left(dx+c\right)+1\right)+32\,ab\cos\left(\right.}{48\,d\cos\left(dx+c\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/48*(3*(4*a^2 - b^2)*cos(d*x + c)^4*log(sin(d*x + c) + 1) - 3*(4*a^2 - b^2
)*cos(d*x + c)^4*log(-sin(d*x + c) + 1) + 32*a*b*cos(d*x + c) + 6*((4*a^2 -
 b^2)*cos(d*x + c)^2 + 2*b^2)*sin(d*x + c))/(d*cos(d*x + c)^4)
```

giac [B] time = 0.57, size = 249, normalized size = 2.52

$$3\left(4\,a^2-b^2\right)\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-3\left(4\,a^2-b^2\right)\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)+\frac{2\left(12\,a^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^7+3\,b^2\tan\left(\frac{1}{2}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/24*(3*(4*a^2 - b^2)*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 3*(4*a^2 - b^2)*
log(abs(tan(1/2*d*x + 1/2*c) - 1)) + 2*(12*a^2*tan(1/2*d*x + 1/2*c)^7 + 3*b
^2*tan(1/2*d*x + 1/2*c)^7 - 48*a*b*tan(1/2*d*x + 1/2*c)^6 - 12*a^2*tan(1/2*
d*x + 1/2*c)^5 + 21*b^2*tan(1/2*d*x + 1/2*c)^5 + 48*a*b*tan(1/2*d*x + 1/2*c
)^4 - 12*a^2*tan(1/2*d*x + 1/2*c)^3 + 21*b^2*tan(1/2*d*x + 1/2*c)^3 - 16*a*
b*tan(1/2*d*x + 1/2*c)^2 + 12*a^2*tan(1/2*d*x + 1/2*c) + 3*b^2*tan(1/2*d*x
+ 1/2*c) + 16*a*b)/(tan(1/2*d*x + 1/2*c)^2 - 1)^4)/d
```

maple [A] time = 0.42, size = 143, normalized size = 1.44

$$\frac{a^2\sec\left(dx+c\right)\tan\left(dx+c\right)}{2d}+\frac{a^2\ln\left(\sec\left(dx+c\right)+\tan\left(dx+c\right)\right)}{2d}+\frac{2ab}{3d\cos\left(dx+c\right)^3}+\frac{b^2\left(\sin^3\left(dx+c\right)\right)}{4d\cos\left(dx+c\right)^4}+\frac{b^2\left(\sin^3\left(dx\right.\right.}{8d\cos\left(dx\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3*(a+b*tan(d*x+c))^2,x)
```

```
[Out] 1/2*a^2*sec(d*x+c)*tan(d*x+c)/d+1/2/d*a^2*ln(sec(d*x+c)+tan(d*x+c))+2/3/d*a
*b/cos(d*x+c)^3+1/4/d*b^2*sin(d*x+c)^3/cos(d*x+c)^4+1/8/d*b^2*sin(d*x+c)^3/
cos(d*x+c)^2+1/8*b^2*sin(d*x+c)/d-1/8/d*b^2*ln(sec(d*x+c)+tan(d*x+c))
```

maxima [A] time = 0.33, size = 129, normalized size = 1.30

$$\frac{3\,b^2\left(\frac{2\left(\sin(dx+c)^3+\sin(dx+c)\right)}{\sin(dx+c)^4-2\,\sin(dx+c)^2+1}-\log\left(\sin\left(dx+c\right)+1\right)+\log\left(\sin\left(dx+c\right)-1\right)\right)-12\,a^2\left(\frac{2\,\sin(dx+c)}{\sin(dx+c)^2-1}-\log\left(\sin\left(dx\right.\right.\right.}{48\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/48*(3*b^2*(2*(sin(d*x + c)^3 + sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(d*x
+ c)^2 + 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)) - 12*a^2*(2*si
n(d*x + c)/(sin(d*x + c)^2 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c)
- 1)) + 32*a*b/cos(d*x + c)^3)/d
```

mupad [B] time = 6.24, size = 216, normalized size = 2.18

$$\frac{\left(a^2+\frac{b^2}{4}\right)\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^7-4\,a\,b\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6+\left(\frac{7\,b^2}{4}-a^2\right)\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^5+4\,a\,b\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+\left(\frac{7\,b^2}{4}-a^2\right)\,\mathrm{t}}{d\,\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^8-4\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6+6\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-4\tan\left(\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))^2/cos(c + d*x)^3,x)
```

```
[Out] ((4*a*b)/3 + tan(c/2 + (d*x)/2)*(a^2 + b^2/4) + tan(c/2 + (d*x)/2)^7*(a^2 +
 b^2/4) - tan(c/2 + (d*x)/2)^3*(a^2 - (7*b^2)/4) - tan(c/2 + (d*x)/2)^5*(a^
2 - (7*b^2)/4) - (4*a*b*tan(c/2 + (d*x)/2)^2)/3 + 4*a*b*tan(c/2 + (d*x)/2)^
4 - 4*a*b*tan(c/2 + (d*x)/2)^6)/(d*(6*tan(c/2 + (d*x)/2)^4 - 4*tan(c/2 + (d
*x)/2)^2 - 4*tan(c/2 + (d*x)/2)^6 + tan(c/2 + (d*x)/2)^8 + 1)) + (atanh(tan
(c/2 + (d*x)/2))*(a^2 - b^2/4))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(a+b\tan\left(c+dx\right)\right)^2\sec^3\left(c+dx\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3*(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**2*sec(c + d*x)**3, x)
```

3.526 $\int \sec(c+dx)(a+b\tan(c+dx))^2\,dx$

Optimal. Leaf size=65

$$\frac{(2a^2-b^2)\tanh^{-1}(\sin(c+dx))}{2d}+\frac{3ab\sec(c+dx)}{2d}+\frac{b\sec(c+dx)(a+b\tan(c+dx))}{2d}$$

```
[Out] 1/2*(2*a^2-b^2)*arctanh(sin(d*x+c))/d+3/2*a*b*sec(d*x+c)/d+1/2*b*sec(d*x+c)
*(a+b*tan(d*x+c))/d
```

Rubi [A] time = 0.05, antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {3508, 3486, 3770}

$$\frac{(2a^2-b^2)\tanh^{-1}(\sin(c+dx))}{2d}+\frac{3ab\sec(c+dx)}{2d}+\frac{b\sec(c+dx)(a+b\tan(c+dx))}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] ((2*a^2 - b^2)*ArcTanh[Sin[c + d*x]])/(2*d) + (3*a*b*Sec[c + d*x])/(2*d) +
(b*Sec[c + d*x]*(a + b*Tan[c + d*x]))/(2*d)
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3508

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^2, x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(
m + 1)), x] + Dist[1/(m + 1), Int[(d*Sec[e + f*x])^m*(a^2*(m + 1) - b^2 + a
*b*(m + 2)*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, m}, x] && NeQ[a^2
 + b^2, 0] && NeQ[m, -1]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\begin{aligned}\int \sec(c+dx)(a+b\tan(c+dx))^2\,dx &= \frac{b\sec(c+dx)(a+b\tan(c+dx))}{2d}+\frac{1}{2}\int \sec(c+dx)\left(2a^2-b^2+3ab\tan(c\right.\\ &= \frac{3ab\sec(c+dx)}{2d}+\frac{b\sec(c+dx)(a+b\tan(c+dx))}{2d}+\frac{1}{2}\left(2a^2-b^2\right)\int \sec(\\ &= \frac{(2a^2-b^2)\tanh^{-1}(\sin(c+dx))}{2d}+\frac{3ab\sec(c+dx)}{2d}+\frac{b\sec(c+dx)(a+b\,t}{2d}\end{aligned}$$

Mathematica [A] time = 0.04, size = 67, normalized size = 1.03

$$\frac{a^2\tanh^{-1}(\sin(c+dx))}{d}+\frac{2ab\sec(c+dx)}{d}-\frac{b^2\tanh^{-1}(\sin(c+dx))}{2d}+\frac{b^2\tan(c+dx)\sec(c+dx)}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (a^2*ArcTanh[Sin[c + d*x]])/d - (b^2*ArcTanh[Sin[c + d*x]])/(2*d) + (2*a*b*
Sec[c + d*x])/d + (b^2*Sec[c + d*x]*Tan[c + d*x])/(2*d)
```

fricas [A] time = 0.70, size = 96, normalized size = 1.48

$$\frac{\left(2\,a^2-b^2\right)\cos\left(dx+c\right)^2\log\left(\sin\left(dx+c\right)+1\right)-\left(2\,a^2-b^2\right)\cos\left(dx+c\right)^2\log\left(-\sin\left(dx+c\right)+1\right)+8\,ab\cos\left(dx\right.}{4\,d\cos\left(dx+c\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/4*((2*a^2 - b^2)*cos(d*x + c)^2*log(sin(d*x + c) + 1) - (2*a^2 - b^2)*cos
(d*x + c)^2*log(-sin(d*x + c) + 1) + 8*a*b*cos(d*x + c) + 2*b^2*sin(d*x + c
))/(d*cos(d*x + c)^2)
```

giac [B] time = 0.47, size = 122, normalized size = 1.88

$$\frac{\left(2\,a^2-b^2\right)\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-\left(2\,a^2-b^2\right)\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)+\frac{2\left(b^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3-4\,ab\tan\left(\frac{1}{2}\,dx\right.\right.}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\right.\right.}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/2*((2*a^2 - b^2)*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - (2*a^2 - b^2)*log(a
bs(tan(1/2*d*x + 1/2*c) - 1)) + 2*(b^2*tan(1/2*d*x + 1/2*c)^3 - 4*a*b*tan(1
/2*d*x + 1/2*c)^2 + b^2*tan(1/2*d*x + 1/2*c) + 4*a*b)/(tan(1/2*d*x + 1/2*c)
^2 - 1)^2)/d
```

maple [A] time = 0.14, size = 98, normalized size = 1.51

$$\frac{a^2\ln\left(\sec\left(dx+c\right)+\tan\left(dx+c\right)\right)}{d}+\frac{2ab}{d\cos\left(dx+c\right)}+\frac{b^2\left(\sin^3\left(dx+c\right)\right)}{2d\cos\left(dx+c\right)^2}+\frac{b^2\sin\left(dx+c\right)}{2d}-\frac{b^2\ln\left(\sec\left(dx+c\right)+\tan\right.}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)*(a+b*tan(d*x+c))^2,x)
```

```
[Out] 1/d*a^2*ln(sec(d*x+c)+tan(d*x+c))+2/d*a*b/cos(d*x+c)+1/2/d*b^2*sin(d*x+c)^3
/cos(d*x+c)^2+1/2*b^2*sin(d*x+c)/d-1/2/d*b^2*ln(sec(d*x+c)+tan(d*x+c))
```

maxima [A] time = 0.32, size = 82, normalized size = 1.26

$$-\frac{b^2\left(\frac{2\,\sin\left(dx+c\right)}{\sin\left(dx+c\right)^2-1}+\log\left(\sin\left(dx+c\right)+1\right)-\log\left(\sin\left(dx+c\right)-1\right)\right)-4\,a^2\log\left(\sec\left(dx+c\right)+\tan\left(dx+c\right)\right)-\frac{8\,a}{\cos(d}}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/4*(b^2*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) + log(sin(d*x + c) + 1) - lo
g(sin(d*x + c) - 1)) - 4*a^2*log(sec(d*x + c) + tan(d*x + c)) - 8*a*b/cos(d
*x + c))/d
```

mupad [B] time = 4.17, size = 106, normalized size = 1.63

$$\frac{b^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3+b^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)-4\,a\,b\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+4\,a\,b}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2+1\right)}+\frac{\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)\left(2\,a^2-b^2\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))^2/cos(c + d*x),x)
```

```
[Out] (4*a*b + b^2*tan(c/2 + (d*x)/2)^3 + b^2*tan(c/2 + (d*x)/2) - 4*a*b*tan(c/2
+ (d*x)/2)^2)/(d*(tan(c/2 + (d*x)/2)^4 - 2*tan(c/2 + (d*x)/2)^2 + 1)) + (at
anh(tan(c/2 + (d*x)/2))*(2*a^2 - b^2))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+b\tan(c+dx))^2\sec(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**2*sec(c + d*x), x)
```

3.527 $\int \cos(c+dx)(a+b\tan(c+dx))^2\,dx$

Optimal. Leaf size=47

$$\frac{(a^2-b^2)\sin(c+dx)}{d}-\frac{2ab\cos(c+dx)}{d}+\frac{b^2\tanh^{-1}(\sin(c+dx))}{d}$$

```
[Out] b^2*arctanh(sin(d*x+c))/d-2*a*b*cos(d*x+c)/d+(a^2-b^2)*sin(d*x+c)/d
```

Rubi [A] time = 0.03, antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {3507}

$$\frac{(a^2-b^2)\sin(c+dx)}{d}-\frac{2ab\cos(c+dx)}{d}+\frac{b^2\tanh^{-1}(\sin(c+dx))}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (b^2*ArcTanh[Sin[c + d*x]])/d - (2*a*b*Cos[c + d*x])/d + ((a^2 - b^2)*Sin[c
 + d*x])/d
```

Rule 3507

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^2/sec[(e_.) + (f_.)*(x_)], x_Sym
bol] :> Simp[(b^2*ArcTanh[Sin[e + f*x]])/f, x] + (-Simp[(2*a*b*Cos[e + f*x]
)/f, x] + Simp[((a^2 - b^2)*Sin[e + f*x])/f, x]) /; FreeQ[{a, b, e, f}, x]
&& NeQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \cos(c+dx)(a+b\tan(c+dx))^2\,dx=\frac{b^2\tanh^{-1}(\sin(c+dx))}{d}-\frac{2ab\cos(c+dx)}{d}+\frac{(a^2-b^2)\sin(c+dx)}{d}$$

Mathematica [A] time = 0.14, size = 84, normalized size = 1.79

$$\frac{(a^2-b^2)\sin(c+dx)-2ab\cos(c+dx)+b^2\left(\log\left(\sin\left(\frac{1}{2}(c+dx)\right)+\cos\left(\frac{1}{2}(c+dx)\right)\right)-\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\right.\right.}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (-2*a*b*Cos[c + d*x] + b^2*(-Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + Log
[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]) + (a^2 - b^2)*Sin[c + d*x])/d
```

fricas [A] time = 0.75, size = 62, normalized size = 1.32

$$-\frac{4\,ab\cos(dx+c)-b^2\log(\sin(dx+c)+1)+b^2\log(-\sin(dx+c)+1)-2\left(a^2-b^2\right)\sin(dx+c)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -1/2*(4*a*b*cos(d*x + c) - b^2*log(sin(d*x + c) + 1) + b^2*log(-sin(d*x + c
) + 1) - 2*(a^2 - b^2)*sin(d*x + c))/d
```

giac [B] time = 1.03, size = 1316, normalized size = 28.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -1/2*(b^2*log(2*(tan(1/2*d*x)^4*tan(1/2*c)^2 + 2*tan(1/2*d*x)^4*tan(1/2*c)
+ 2*tan(1/2*d*x)^3*tan(1/2*c)^2 + tan(1/2*d*x)^4 + 2*tan(1/2*d*x)^2*tan(1/2
*c)^2 - 2*tan(1/2*d*x)^3 + 2*tan(1/2*d*x)*tan(1/2*c)^2 + 2*tan(1/2*d*x)^2 +
 tan(1/2*c)^2 - 2*tan(1/2*d*x) - 2*tan(1/2*c) + 1)/(tan(1/2*c)^2 + 1))*tan(
1/2*d*x)^2*tan(1/2*c)^2 - b^2*log(2*(tan(1/2*d*x)^4*tan(1/2*c)^2 - 2*tan(1/
2*d*x)^4*tan(1/2*c) - 2*tan(1/2*d*x)^3*tan(1/2*c)^2 + tan(1/2*d*x)^4 + 2*ta
n(1/2*d*x)^2*tan(1/2*c)^2 + 2*tan(1/2*d*x)^3 - 2*tan(1/2*d*x)*tan(1/2*c)^2
+ 2*tan(1/2*d*x)^2 + tan(1/2*c)^2 + 2*tan(1/2*d*x) + 2*tan(1/2*c) + 1)/(tan
(1/2*c)^2 + 1))*tan(1/2*d*x)^2*tan(1/2*c)^2 + 4*a*b*tan(1/2*d*x)^2*tan(1/2*
c)^2 + b^2*log(2*(tan(1/2*d*x)^4*tan(1/2*c)^2 + 2*tan(1/2*d*x)^4*tan(1/2*c)
 + 2*tan(1/2*d*x)^3*tan(1/2*c)^2 + tan(1/2*d*x)^4 + 2*tan(1/2*d*x)^2*tan(1/
2*c)^2 - 2*tan(1/2*d*x)^3 + 2*tan(1/2*d*x)*tan(1/2*c)^2 + 2*tan(1/2*d*x)^2
+ tan(1/2*c)^2 - 2*tan(1/2*d*x) - 2*tan(1/2*c) + 1)/(tan(1/2*c)^2 + 1))*tan
(1/2*d*x)^2 - b^2*log(2*(tan(1/2*d*x)^4*tan(1/2*c)^2 - 2*tan(1/2*d*x)^4*tan
(1/2*c) - 2*tan(1/2*d*x)^3*tan(1/2*c)^2 + tan(1/2*d*x)^4 + 2*tan(1/2*d*x)^2
*tan(1/2*c)^2 + 2*tan(1/2*d*x)^3 - 2*tan(1/2*d*x)*tan(1/2*c)^2 + 2*tan(1/2*
d*x)^2 + tan(1/2*c)^2 + 2*tan(1/2*d*x) + 2*tan(1/2*c) + 1)/(tan(1/2*c)^2 +
1))*tan(1/2*d*x)^2 + 4*a^2*tan(1/2*d*x)^2*tan(1/2*c) - 4*b^2*tan(1/2*d*x)^2
*tan(1/2*c) + b^2*log(2*(tan(1/2*d*x)^4*tan(1/2*c)^2 + 2*tan(1/2*d*x)^4*tan
(1/2*c) + 2*tan(1/2*d*x)^3*tan(1/2*c)^2 + tan(1/2*d*x)^4 + 2*tan(1/2*d*x)^2
*tan(1/2*c)^2 - 2*tan(1/2*d*x)^3 + 2*tan(1/2*d*x)*tan(1/2*c)^2 + 2*tan(1/2*
d*x)^2 + tan(1/2*c)^2 - 2*tan(1/2*d*x) - 2*tan(1/2*c) + 1)/(tan(1/2*c)^2 +
1))*tan(1/2*c)^2 - b^2*log(2*(tan(1/2*d*x)^4*tan(1/2*c)^2 - 2*tan(1/2*d*x)^
4*tan(1/2*c) - 2*tan(1/2*d*x)^3*tan(1/2*c)^2 + tan(1/2*d*x)^4 + 2*tan(1/2*d
*x)^2*tan(1/2*c)^2 + 2*tan(1/2*d*x)^3 - 2*tan(1/2*d*x)*tan(1/2*c)^2 + 2*tan
(1/2*d*x)^2 + tan(1/2*c)^2 + 2*tan(1/2*d*x) + 2*tan(1/2*c) + 1)/(tan(1/2*c)
^2 + 1))*tan(1/2*c)^2 + 4*a^2*tan(1/2*d*x)*tan(1/2*c)^2 - 4*b^2*tan(1/2*d*x
)*tan(1/2*c)^2 - 4*a*b*tan(1/2*d*x)^2 - 16*a*b*tan(1/2*d*x)*tan(1/2*c) - 4*
a*b*tan(1/2*c)^2 + b^2*log(2*(tan(1/2*d*x)^4*tan(1/2*c)^2 + 2*tan(1/2*d*x)^
4*tan(1/2*c) + 2*tan(1/2*d*x)^3*tan(1/2*c)^2 + tan(1/2*d*x)^4 + 2*tan(1/2*d
*x)^2*tan(1/2*c)^2 - 2*tan(1/2*d*x)^3 + 2*tan(1/2*d*x)*tan(1/2*c)^2 + 2*tan
(1/2*d*x)^2 + tan(1/2*c)^2 - 2*tan(1/2*d*x) - 2*tan(1/2*c) + 1)/(tan(1/2*c)
^2 + 1)) - b^2*log(2*(tan(1/2*d*x)^4*tan(1/2*c)^2 - 2*tan(1/2*d*x)^4*tan(1/
2*c) - 2*tan(1/2*d*x)^3*tan(1/2*c)^2 + tan(1/2*d*x)^4 + 2*tan(1/2*d*x)^2*ta
n(1/2*c)^2 + 2*tan(1/2*d*x)^3 - 2*tan(1/2*d*x)*tan(1/2*c)^2 + 2*tan(1/2*d*x
)^2 + tan(1/2*c)^2 + 2*tan(1/2*d*x) + 2*tan(1/2*c) + 1)/(tan(1/2*c)^2 + 1))
 - 4*a^2*tan(1/2*d*x) + 4*b^2*tan(1/2*d*x) - 4*a^2*tan(1/2*c) + 4*b^2*tan(1
/2*c) + 4*a*b)/(d*tan(1/2*d*x)^2*tan(1/2*c)^2 + d*tan(1/2*d*x)^2 + d*tan(1/
2*c)^2 + d)
```

maple [A] time = 0.27, size = 63, normalized size = 1.34

$$\frac{a^2 \sin(dx+c)}{d} - \frac{b^2 \sin(dx+c)}{d} - \frac{2ab \cos(dx+c)}{d} + \frac{b^2 \ln(\sec(dx+c) + \tan(dx+c))}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)*(a+b*tan(d*x+c))^2,x)
```

```
[Out] a^2*sin(d*x+c)/d-b^2*sin(d*x+c)/d-2*a*b*cos(d*x+c)/d+1/d*b^2*ln(sec(d*x+c)+
tan(d*x+c))
```

maxima [A] time = 0.33, size = 60, normalized size = 1.28

$$\frac{b^2\Big(\log(\sin(dx+c)+1)-\log(\sin(dx+c)-1)-2\sin(dx+c)\Big)-4\,ab\cos(dx+c)+2\,a^2\sin(dx+c)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/2*(b^2*(log(sin(d*x + c) + 1) - log(sin(d*x + c) - 1) - 2*sin(d*x + c)) -
 4*a*b*cos(d*x + c) + 2*a^2*sin(d*x + c))/d
```

mupad [B] time = 3.89, size = 66, normalized size = 1.40

$$\frac{2\,b^2\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d}-\frac{4\,a\,b-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(2\,a^2-2\,b^2\right)}{d\,\left({\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)*(a + b*tan(c + d*x))^2,x)
```

```
[Out] (2*b^2*atanh(tan(c/2 + (d*x)/2)))/d - (4*a*b - tan(c/2 + (d*x)/2)*(2*a^2 -
2*b^2))/(d*(tan(c/2 + (d*x)/2)^2 + 1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+b\tan(c+dx))^2\cos(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**2*cos(c + d*x), x)
```

3.528 $\int \cos^3(c+dx)(a+b\tan(c+dx))^2\,dx$

Optimal. Leaf size=90

$$-\frac{(2a^2+b^2)\sin^3(c+dx)}{6d}+\frac{(2a^2+b^2)\sin(c+dx)}{2d}-\frac{ab\cos^3(c+dx)}{6d}-\frac{b\cos^3(c+dx)(a+b\tan(c+dx))}{2d}$$

```
[Out] -1/6*a*b*cos(d*x+c)^3/d+1/2*(2*a^2+b^2)*sin(d*x+c)/d-1/6*(2*a^2+b^2)*sin(d*
x+c)^3/d-1/2*b*cos(d*x+c)^3*(a+b*tan(d*x+c))/d
```

Rubi [A] time = 0.09, antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3508, 3486, 2633}

$$-\frac{(2a^2+b^2)\sin^3(c+dx)}{6d}+\frac{(2a^2+b^2)\sin(c+dx)}{2d}-\frac{ab\cos^3(c+dx)}{6d}-\frac{b\cos^3(c+dx)(a+b\tan(c+dx))}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] -(a*b*Cos[c + d*x]^3)/(6*d) + ((2*a^2 + b^2)*Sin[c + d*x])/(2*d) - ((2*a^2
+ b^2)*Sin[c + d*x]^3)/(6*d) - (b*Cos[c + d*x]^3*(a + b*Tan[c + d*x]))/(2*d
)
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3508

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^2, x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(
m + 1)), x] + Dist[1/(m + 1), Int[(d*Sec[e + f*x])^m*(a^2*(m + 1) - b^2 + a
*b*(m + 2)*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, m}, x] && NeQ[a^2
 + b^2, 0] && NeQ[m, -1]
```

Rubi steps

$$\int \cos^3(c+dx)(a+b\tan(c+dx))^2\,dx = -\frac{b\cos^3(c+dx)(a+b\tan(c+dx))}{2d}-\frac{1}{2}\int \cos^3(c+dx)\left(-2a^2-b^2-ab\right.$$
$$=-\frac{ab\cos^3(c+dx)}{6d}-\frac{b\cos^3(c+dx)(a+b\tan(c+dx))}{2d}-\frac{1}{2}\left(-2a^2-b^2\right)\int$$
$$=-\frac{ab\cos^3(c+dx)}{6d}-\frac{b\cos^3(c+dx)(a+b\tan(c+dx))}{2d}-\frac{(2a^2+b^2)\,\text{Subs}}{}$$
$$=-\frac{ab\cos^3(c+dx)}{6d}+\frac{(2a^2+b^2)\sin(c+dx)}{2d}-\frac{(2a^2+b^2)\sin^3(c+dx)}{6d}-$$

Mathematica [A] time = 0.46, size = 64, normalized size = 0.71

$$\frac{\sin(c+dx)\left(\left(a^2-b^2\right)\cos(2(c+dx))+5a^2+b^2\right)-3ab\cos(c+dx)-ab\cos(3(c+dx))}{6d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (-3*a*b*Cos[c + d*x] - a*b*Cos[3*(c + d*x)] + (5*a^2 + b^2 + (a^2 - b^2)*Co
s[2*(c + d*x)])*Sin[c + d*x])/(6*d)
```

fricas [A] time = 0.67, size = 53, normalized size = 0.59

$$-\frac{2\,ab\cos\left(dx+c\right)^3-\left(\left(a^2-b^2\right)\cos\left(dx+c\right)^2+2\,a^2+b^2\right)\sin\left(dx+c\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -1/3*(2*a*b*cos(d*x + c)^3 - ((a^2 - b^2)*cos(d*x + c)^2 + 2*a^2 + b^2)*sin
(d*x + c))/d
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError >> Unable to parse Giac output: Unabl
e to check sign: (4*pi/x/2)>(-4*pi/x/2)Unable to check sign: (4*pi/x/2)>(-4
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*x/2)^3-96*a^2*tan(c/2)^6*tan(d*x/2)-96*a^2*tan(c/2)^5*tan(d*x/2)^6+288*a^2
*tan(c/2)^5*tan(d*x/2)^4-288*a^2*tan(c/2)^5*tan(d*x/2)^2+96*a^2*tan(c/2)^5+
288*a^2*tan(c/2)^4*tan(d*x/2)^5-1344*a^2*tan(c/2)^4*tan(d*x/2)^3+288*a^2*ta
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d*x/2)^4+1344*a^2*tan(c/2)^3*tan(d*x/2)^2+64*a^2*tan(c/2)^3-288*a^2*tan(c/2
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(c/2)*tan(d*x/2)^2+96*a^2*tan(c/2)+96*a^2*tan(d*x/2)^5+64*a^2*tan(d*x/2)^3+
96*a^2*tan(d*x/2)-3*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*
x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-t
an(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan
(d*x/2)^6-9*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan
(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^
2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^
4-9*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-
tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(
c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^2-3*a*b*
pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/
2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan
(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6-9*a*b*pi*sign(tan(c/2)^2*ta
n(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*
sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+
tan(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)^6-27*a*b*pi*sign(tan(c/2)^2*tan(d*x/2
)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(ta
n(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x
/2)^2-1)*tan(c/2)^4*tan(d*x/2)^4-27*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*t
an(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^
2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1
)*tan(c/2)^4*tan(d*x/2)^2-9*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^
2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*
x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/
```

```
2)^4-9*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)
^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*t
an(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^6-27*
a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(
d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)
*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^4-27*a*b*pi*
sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^
2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*
x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^2-9*a*b*pi*sign(tan
(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(
d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2
*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2-3*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+
2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/
2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^
2-1)*tan(d*x/2)^6-9*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*
x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-t
an(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^4-9
*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan
(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2
)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^2-3*a*b*pi*sign(tan(c/
2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x
/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*ta
n(c/2)+tan(d*x/2)^2-1)-3*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*t
an(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2
)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^
6*tan(d*x/2)^6-9*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2
)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(
c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*
x/2)^4-9*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/
2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2
*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^2-3
*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan
(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2
)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6-9*a*b*pi*sign(tan(c/2)
^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2
)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(
c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)^6-27*a*b*pi*sign(tan(c/2)^2*tan(
d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*si
gn(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+ta
n(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)^4-27*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^
2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(
c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2
)^2-1)*tan(c/2)^4*tan(d*x/2)^2-9*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(
c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*t
an(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*t
an(c/2)^4-9*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan
(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^
2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^
6-27*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2
-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan
(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^4-27*a*
b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*
x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*t
an(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^2-9*a*b*pi*sig
n(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2
*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2
)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2-3*a*b*pi*sign(tan(c/2)^2*tan(d*x/
2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(t
an(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*
```

x/2)^2-1)*tan(d*x/2)^6-9*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*t
an(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2
)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2
)^4-9*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^
2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*ta
n(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^2-3*a*b*pi*sign(t
an(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*ta
n(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2
-2*tan(c/2)+tan(d*x/2)^2-1)-3*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^
2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^
6-9*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+
2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^4-9*a*b*pi*sign(tan(c/2)^2
*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)
*tan(c/2)^6*tan(d*x/2)^2-3*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2
*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6-9*a*b*pi*sign(
tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d
*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)^6-27*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-t
an(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan
(d*x/2)^4-27*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(
d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)^2-9*a*b*pi*sign(t
an(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*
x/2)^2-1)*tan(c/2)^4-9*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan
(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^6-27*a*
b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(
c/2)+tan(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^4-27*a*b*pi*sign(tan(c/2)^2*tan(
d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(
c/2)^2*tan(d*x/2)^2-9*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(
c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2-3*a*b*pi*sign(tan(c
/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)
^2-1)*tan(d*x/2)^6-9*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c
/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^4-9*a*b*pi*sign(tan(
c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2
)^2-1)*tan(d*x/2)^2-3*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(
c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)-3*a*b*pi*sign(tan(c/2)^2*tan(d
*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c
/2)^6*tan(d*x/2)^6-9*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c
/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^4-9*a*b*p
i*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2
)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^2-3*a*b*pi*sign(tan(c/2)^2*tan(d*x/
2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)
^6-9*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2
-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)^6-27*a*b*pi*sign(tan(c/2)
^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-
1)*tan(c/2)^4*tan(d*x/2)^4-27*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^
2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)^
2-9*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-
2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4-9*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2
-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2*t
an(d*x/2)^6-27*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*ta
n(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^4-27*a*b*pi*sig
n(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan
(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^2-9*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-
tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2-3*
a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*ta
n(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^6-9*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-t
an(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^4-9
*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*t
an(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^2-3*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-
tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)-6*a*b*atan((t

an(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan
(d*x/2)-1))*tan(c/2)^6*tan(d*x/2)^6-18*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/
2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^6*ta
n(d*x/2)^4-18*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2
)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^6*tan(d*x/2)^2-6*a*b*atan((ta
n(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(
d*x/2)-1))*tan(c/2)^6-18*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-
1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^4*tan(d*x/2)^6-54*
a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-t
an(c/2)-tan(d*x/2)-1))*tan(c/2)^4*tan(d*x/2)^4-54*a*b*atan((tan(c/2)*tan(d*
x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*ta
n(c/2)^4*tan(d*x/2)^2-18*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-
1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^4-18*a*b*atan((tan
(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d
*x/2)-1))*tan(c/2)^2*tan(d*x/2)^6-54*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)
+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^2*tan(
d*x/2)^4-54*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*
tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^2*tan(d*x/2)^2-18*a*b*atan((tan
(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d
*x/2)-1))*tan(c/2)^2-6*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)
/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(d*x/2)^6-18*a*b*atan((tan
(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d
*x/2)-1))*tan(d*x/2)^4-18*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)
-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(d*x/2)^2-6*a*b*atan((t
an(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan
(d*x/2)-1))+6*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2
)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^6*tan(d*x/2)^6+18*a*b*atan((t
an(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan
(d*x/2)+1))*tan(c/2)^6*tan(d*x/2)^4+18*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/
2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^6*ta
n(d*x/2)^2+6*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)
*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^6+18*a*b*atan((tan(c/2)*tan(d*
x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*ta
n(c/2)^4*tan(d*x/2)^6+54*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+
1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^4*tan(d*x/2)^4+54*
a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-t
an(c/2)+tan(d*x/2)+1))*tan(c/2)^4*tan(d*x/2)^2+18*a*b*atan((tan(c/2)*tan(d*
x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*ta
n(c/2)^4+18*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*
tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^2*tan(d*x/2)^6+54*a*b*atan((tan
(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d
*x/2)+1))*tan(c/2)^2*tan(d*x/2)^4+54*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)
-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^2*tan(
d*x/2)^2+18*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*
tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^2+6*a*b*atan((tan(c/2)*tan(d*x/
2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(
d*x/2)^6+18*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*
tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(d*x/2)^4+18*a*b*atan((tan(c/2)*tan(d
*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*t
an(d*x/2)^2+6*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2
)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))+6*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/
2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^6*ta
n(d*x/2)^6+18*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2
)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^6*tan(d*x/2)^4+18*a*b*atan((t
an(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan
(d*x/2)+1))*tan(c/2)^6*tan(d*x/2)^2+6*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2
)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^6+18*
a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+t
an(c/2)-tan(d*x/2)+1))*tan(c/2)^4*tan(d*x/2)^6+54*a*b*atan((tan(c/2)*tan(d*

x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*ta
n(c/2)^4*tan(d*x/2)^4+54*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+
1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^4*tan(d*x/2)^2+18*
a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+t
an(c/2)-tan(d*x/2)+1))*tan(c/2)^4+18*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)
+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^2*tan(
d*x/2)^6+54*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*
tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^2*tan(d*x/2)^4+54*a*b*atan((tan
(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d
*x/2)+1))*tan(c/2)^2*tan(d*x/2)^2+18*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)
+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^2+6*a*
b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan
(c/2)-tan(d*x/2)+1))*tan(d*x/2)^6+18*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)
+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(d*x/2)^4+18
*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+
tan(c/2)-tan(d*x/2)+1))*tan(d*x/2)^2+6*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/
2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))-6*a*b*atan((t
an(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan
(d*x/2)-1))*tan(c/2)^6*tan(d*x/2)^6-18*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/
2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^6*ta
n(d*x/2)^4-18*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2
)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^6*tan(d*x/2)^2-6*a*b*atan((ta
n(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(
d*x/2)-1))*tan(c/2)^6-18*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-
1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^4*tan(d*x/2)^6-54*
a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+t
an(c/2)+tan(d*x/2)-1))*tan(c/2)^4*tan(d*x/2)^4-54*a*b*atan((tan(c/2)*tan(d*
x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*ta
n(c/2)^4*tan(d*x/2)^2-18*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-
1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^4-18*a*b*atan((tan
(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d
*x/2)-1))*tan(c/2)^2*tan(d*x/2)^6-54*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)
-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^2*tan(
d*x/2)^4-54*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*
tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^2*tan(d*x/2)^2-18*a*b*atan((tan
(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d
*x/2)-1))*tan(c/2)^2-6*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)
/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(d*x/2)^6-18*a*b*atan((tan
(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d
*x/2)-1))*tan(d*x/2)^4-18*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)
-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(d*x/2)^2-6*a*b*atan((t
an(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan
(d*x/2)-1))-32*a*b*tan(c/2)^6*tan(d*x/2)^6+96*a*b*tan(c/2)^6*tan(d*x/2)^4-9
6*a*b*tan(c/2)^6*tan(d*x/2)^2+32*a*b*tan(c/2)^6+384*a*b*tan(c/2)^5*tan(d*x/
2)^5-768*a*b*tan(c/2)^5*tan(d*x/2)^3+384*a*b*tan(c/2)^5*tan(d*x/2)+96*a*b*t
an(c/2)^4*tan(d*x/2)^6-1824*a*b*tan(c/2)^4*tan(d*x/2)^4+1824*a*b*tan(c/2)^4
*tan(d*x/2)^2-96*a*b*tan(c/2)^4-768*a*b*tan(c/2)^3*tan(d*x/2)^5+3584*a*b*ta
n(c/2)^3*tan(d*x/2)^3-768*a*b*tan(c/2)^3*tan(d*x/2)-96*a*b*tan(c/2)^2*tan(d
*x/2)^6+1824*a*b*tan(c/2)^2*tan(d*x/2)^4-1824*a*b*tan(c/2)^2*tan(d*x/2)^2+9
6*a*b*tan(c/2)^2+384*a*b*tan(c/2)*tan(d*x/2)^5-768*a*b*tan(c/2)*tan(d*x/2)^
3+384*a*b*tan(c/2)*tan(d*x/2)+32*a*b*tan(d*x/2)^6-96*a*b*tan(d*x/2)^4+96*a*
b*tan(d*x/2)^2-32*a*b-128*b^2*tan(c/2)^6*tan(d*x/2)^3-384*b^2*tan(c/2)^5*ta
n(d*x/2)^4+384*b^2*tan(c/2)^5*tan(d*x/2)^2-384*b^2*tan(c/2)^4*tan(d*x/2)^5+
1152*b^2*tan(c/2)^4*tan(d*x/2)^3-384*b^2*tan(c/2)^4*tan(d*x/2)-128*b^2*tan(
c/2)^3*tan(d*x/2)^6+1152*b^2*tan(c/2)^3*tan(d*x/2)^4-1152*b^2*tan(c/2)^3*ta
n(d*x/2)^2+128*b^2*tan(c/2)^3+384*b^2*tan(c/2)^2*tan(d*x/2)^5-1152*b^2*tan(
c/2)^2*tan(d*x/2)^3+384*b^2*tan(c/2)^2*tan(d*x/2)-384*b^2*tan(c/2)*tan(d*x/
2)^4+384*b^2*tan(c/2)*tan(d*x/2)^2+128*b^2*tan(d*x/2)^3)/(48*d*tan(c/2)^6*t
an(d*x/2)^6+144*d*tan(c/2)^6*tan(d*x/2)^4+144*d*tan(c/2)^6*tan(d*x/2)^2+48*

```
d*tan(c/2)^6+144*d*tan(c/2)^4*tan(d*x/2)^6+432*d*tan(c/2)^4*tan(d*x/2)^4+43
2*d*tan(c/2)^4*tan(d*x/2)^2+144*d*tan(c/2)^4+144*d*tan(c/2)^2*tan(d*x/2)^6+
432*d*tan(c/2)^2*tan(d*x/2)^4+432*d*tan(c/2)^2*tan(d*x/2)^2+144*d*tan(c/2)^
2+48*d*tan(d*x/2)^6+144*d*tan(d*x/2)^4+144*d*tan(d*x/2)^2+48*d)
```

maple [A] time = 0.42, size = 52, normalized size = 0.58

$$\frac{\frac{b^2\left(\sin^3(dx+c)\right)}{3}-\frac{2\left(\cos^3(dx+c)\right)ab}{3}+\frac{a^2\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3*(a+b*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(1/3*b^2*sin(d*x+c)^3-2/3*cos(d*x+c)^3*a*b+1/3*a^2*(2+cos(d*x+c)^2)*sin
(d*x+c))
```

maxima [A] time = 0.33, size = 52, normalized size = 0.58

$$-\frac{2\,ab\cos\left(dx+c\right)^3-b^2\sin\left(dx+c\right)^3+\left(\sin\left(dx+c\right)^3-3\,\sin\left(dx+c\right)\right)a^2}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/3*(2*a*b*cos(d*x + c)^3 - b^2*sin(d*x + c)^3 + (sin(d*x + c)^3 - 3*sin(d
*x + c))*a^2)/d
```

mupad [B] time = 3.76, size = 77, normalized size = 0.86

$$\frac{2\left(\frac{\sin(c+d\,x)\,a^2\cos(c+d\,x)^2}{2}+\sin\left(c+d\,x\right)\,a^2-a\,b\cos\left(c+d\,x\right)^3-\frac{\sin(c+d\,x)\,b^2\cos(c+d\,x)^2}{2}+\frac{\sin(c+d\,x)\,b^2}{2}\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3*(a + b*tan(c + d*x))^2,x)
```

```
[Out] (2*(a^2*sin(c + d*x) + (b^2*sin(c + d*x))/2 + (a^2*cos(c + d*x)^2*sin(c + d
*x))/2 - (b^2*cos(c + d*x)^2*sin(c + d*x))/2 - a*b*cos(c + d*x)^3))/(3*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(a+b\tan\left(c+dx\right)\right)^2\cos^3\left(c+dx\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3*(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**2*cos(c + d*x)**3, x)
```

3.529 $\int \cos^5(c+dx)(a+b\tan(c+dx))^2\,dx$

Optimal. Leaf size=114

$$\frac{(4a^2+b^2)\sin^5(c+dx)}{20d}-\frac{(4a^2+b^2)\sin^3(c+dx)}{6d}+\frac{(4a^2+b^2)\sin(c+dx)}{4d}-\frac{3ab\cos^5(c+dx)}{20d}-\frac{b\cos^5(c+dx)(a+b$$

```
[Out] -3/20*a*b*cos(d*x+c)^5/d+1/4*(4*a^2+b^2)*sin(d*x+c)/d-1/6*(4*a^2+b^2)*sin(d
*x+c)^3/d+1/20*(4*a^2+b^2)*sin(d*x+c)^5/d-1/4*b*cos(d*x+c)^5*(a+b*tan(d*x+c
))/d
```

Rubi [A] time = 0.10, antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3508, 3486, 2633}

$$\frac{(4a^2+b^2)\sin^5(c+dx)}{20d}-\frac{(4a^2+b^2)\sin^3(c+dx)}{6d}+\frac{(4a^2+b^2)\sin(c+dx)}{4d}-\frac{3ab\cos^5(c+dx)}{20d}-\frac{b\cos^5(c+dx)(a+b$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^5*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (-3*a*b*Cos[c + d*x]^5)/(20*d) + ((4*a^2 + b^2)*Sin[c + d*x])/(4*d) - ((4*a
^2 + b^2)*Sin[c + d*x]^3)/(6*d) + ((4*a^2 + b^2)*Sin[c + d*x]^5)/(20*d) - (
b*Cos[c + d*x]^5*(a + b*Tan[c + d*x]))/(4*d)
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3508

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^2, x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(
m + 1)), x] + Dist[1/(m + 1), Int[(d*Sec[e + f*x])^m*(a^2*(m + 1) - b^2 + a
*b*(m + 2)*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, m}, x] && NeQ[a^2
 + b^2, 0] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \cos^5(c+dx)(a+b\tan(c+dx))^2\,dx &= -\frac{b\cos^5(c+dx)(a+b\tan(c+dx))}{4d}-\frac{1}{4}\int \cos^5(c+dx)\left(-4a^2-b^2-3a\right.\\ &= -\frac{3ab\cos^5(c+dx)}{20d}-\frac{b\cos^5(c+dx)(a+b\tan(c+dx))}{4d}-\frac{1}{4}\left(-4a^2-b^2\right)\\ &= -\frac{3ab\cos^5(c+dx)}{20d}-\frac{b\cos^5(c+dx)(a+b\tan(c+dx))}{4d}-\frac{(4a^2+b^2)\,\mathrm{Sub}}{}\\ &= -\frac{3ab\cos^5(c+dx)}{20d}+\frac{(4a^2+b^2)\sin(c+dx)}{4d}-\frac{(4a^2+b^2)\sin^3(c+dx)}{6d}+\end{aligned}$$

Mathematica [A] time = 0.22, size = 116, normalized size = 1.02

$$\frac{150a^2\sin(c+dx)+25a^2\sin(3(c+dx))+3a^2\sin(5(c+dx))-60ab\cos(c+dx)-30ab\cos(3(c+dx))-6ab\,\mathrm{c}}{240d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^5*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (-60*a*b*Cos[c + d*x] - 30*a*b*Cos[3*(c + d*x)] - 6*a*b*Cos[5*(c + d*x)] +
150*a^2*Sin[c + d*x] + 30*b^2*Sin[c + d*x] + 25*a^2*Sin[3*(c + d*x)] - 5*b^
2*Sin[3*(c + d*x)] + 3*a^2*Sin[5*(c + d*x)] - 3*b^2*Sin[5*(c + d*x)])/(240*
d)
```

fricas [A] time = 0.72, size = 74, normalized size = 0.65

$$-\frac{6\,ab\cos(dx+c)^5-\left(3\left(a^2-b^2\right)\cos(dx+c)^4+\left(4\,a^2+b^2\right)\cos(dx+c)^2+8\,a^2+2\,b^2\right)\sin(dx+c)}{15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -1/15*(6*a*b*cos(d*x + c)^5 - (3*(a^2 - b^2)*cos(d*x + c)^4 + (4*a^2 + b^2)
*cos(d*x + c)^2 + 8*a^2 + 2*b^2)*sin(d*x + c))/d
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError >> Unable to parse Giac output: Unabl
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/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^10*tan(d*x/2)^10-225*a
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*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*
tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^10*tan(d*x/2)^8-450*a*b*pi
*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)
^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d
*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^10*tan(d*x/2)^6-450*a*b*pi*sign
(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*
tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)
^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^10*tan(d*x/2)^4-225*a*b*pi*sign(tan(
c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d
*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*
tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^10*tan(d*x/2)^2-45*a*b*pi*sign(tan(c/2)^2
*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-
1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/
2)+tan(d*x/2)^2-1)*tan(c/2)^10-225*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*ta
n(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2
*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)
*tan(c/2)^8*tan(d*x/2)^10-1125*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/
2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan
(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan
(c/2)^8*tan(d*x/2)^8-2250*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*
tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/
2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)
^8*tan(d*x/2)^6-2250*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d
*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-
tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^8*ta
n(d*x/2)^4-1125*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)
+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c

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/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^8*tan(d*x
/2)^2-225*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c
/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+
2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^8-450*a*b*pi*si
gn(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+
2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/
2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^10-2250*a*b*pi*sign(t
an(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*ta
n(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2
+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^8-4500*a*b*pi*sign(tan(c/
2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x
/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*ta
n(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^6-4500*a*b*pi*sign(tan(c/2)^2*
tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1
)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2
)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^4-2250*a*b*pi*sign(tan(c/2)^2*tan(d
*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sig
n(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan
(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^2-450*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^
2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(
c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2
)^2-1)*tan(c/2)^6-450*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(
d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2
-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*t
an(d*x/2)^10-2250*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/
2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan
(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan(d
*x/2)^8-4500*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+ta
n(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)
^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)
^6-4500*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2
)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*
tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)^4-22
50*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-t
an(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c
/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)^2-450*a*b
*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x
/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*ta
n(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4-225*a*b*pi*sign(tan(c/2)^2
*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-
1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/
2)+tan(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^10-1125*a*b*pi*sign(tan(c/2)^2*tan
(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*s
ign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+t
an(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^8-2250*a*b*pi*sign(tan(c/2)^2*tan(d*x/
2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(t
an(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*
x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^6-2250*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+
2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/
2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^
2-1)*tan(c/2)^2*tan(d*x/2)^4-1125*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan
(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*
tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*
tan(c/2)^2*tan(d*x/2)^2-225*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^
2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*
x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/
2)^2-45*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2
)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*
tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^10-225*a*b*pi*s
```

```
ign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2
+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x
/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^8-450*a*b*pi*sign(tan(c/2)^2*ta
n(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*
sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+
tan(d*x/2)^2-1)*tan(d*x/2)^6-450*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(
c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*t
an(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*t
an(d*x/2)^4-225*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)
+tan(c/2)^2-tan(d*x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c
/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^2-45*a*
b*pi*sign(tan(c/2)^2*tan(d*x/2)^2+2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*
x/2)^2+2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*t
an(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)-45*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)
^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan
(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/
2)^2-1)*tan(c/2)^10*tan(d*x/2)^10-225*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2
*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2
)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2
-1)*tan(c/2)^10*tan(d*x/2)^8-450*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(
c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*t
an(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*t
an(c/2)^10*tan(d*x/2)^6-450*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^
2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*
x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/
2)^10*tan(d*x/2)^4-225*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan
(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^
2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^10
*tan(d*x/2)^2-45*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2
)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(
c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^10-225*a
*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d
*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*
tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^8*tan(d*x/2)^10-1125*a*b*p
i*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2
)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(
d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^8*tan(d*x/2)^8-2250*a*b*pi*sig
n(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2
*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2
)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^8*tan(d*x/2)^6-2250*a*b*pi*sign(tan
(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(
d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2
*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^8*tan(d*x/2)^4-1125*a*b*pi*sign(tan(c/2)
^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2
)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(
c/2)+tan(d*x/2)^2-1)*tan(c/2)^8*tan(d*x/2)^2-225*a*b*pi*sign(tan(c/2)^2*tan
(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*s
ign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+t
an(d*x/2)^2-1)*tan(c/2)^8-450*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2
)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(
d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(
c/2)^6*tan(d*x/2)^10-2250*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*
tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/
2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)
^6*tan(d*x/2)^8-4500*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d
*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-
tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*ta
n(d*x/2)^6-4500*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)
+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c
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/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^4-2250*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^2-450*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6-450*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)^10-2250*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)^8-4500*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)^6-4500*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)^4-2250*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)^2-450*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4-225*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^10-1125*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^8-2250*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^6-2250*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^4-1125*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^2-225*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2-45*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^10-225*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^8-450*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^6-450*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^4-225*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^2-45*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-2*tan(c/2)^2*tan(d*x/2)+tan(c/2)^2-tan(d*x/2)^2-2*tan(d*x/2)-1)*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)-45*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^

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2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^10*tan(d*x/2)^10-225*a*b*pi*sign(tan(
c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2
)^2-1)*tan(c/2)^10*tan(d*x/2)^8-450*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan
(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^10*tan(
d*x/2)^6-450*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(
d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^10*tan(d*x/2)^4-225*a*b*pi*sig
n(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan
(d*x/2)^2-1)*tan(c/2)^10*tan(d*x/2)^2-45*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^
2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^10
-225*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2
+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^8*tan(d*x/2)^10-1125*a*b*pi*sign(tan(c
/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)
^2-1)*tan(c/2)^8*tan(d*x/2)^8-2250*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(
c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^8*tan(d*
x/2)^6-2250*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d
*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^8*tan(d*x/2)^4-1125*a*b*pi*sign
(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(
d*x/2)^2-1)*tan(c/2)^8*tan(d*x/2)^2-225*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2
-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^8-4
50*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2
*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^10-2250*a*b*pi*sign(tan(c/2
)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2
-1)*tan(c/2)^6*tan(d*x/2)^8-4500*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/
2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/
2)^6-4500*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x
/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^4-2250*a*b*pi*sign(t
an(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*
x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^2-450*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-t
an(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6-450
*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*t
an(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)^10-2250*a*b*pi*sign(tan(c/2)^
2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1
)*tan(c/2)^4*tan(d*x/2)^8-4500*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)
^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)
^6-4500*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2
)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)^4-2250*a*b*pi*sign(tan
(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/
2)^2-1)*tan(c/2)^4*tan(d*x/2)^2-450*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan
(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4-225*a
*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan
(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^10-1125*a*b*pi*sign(tan(c/2)^2*
tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*
tan(c/2)^2*tan(d*x/2)^8-2250*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2
+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^6
-2250*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^
2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^4-1125*a*b*pi*sign(tan(c
/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)
^2-1)*tan(c/2)^2*tan(d*x/2)^2-225*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c
/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2-45*a*b*
pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/
2)+tan(d*x/2)^2-1)*tan(d*x/2)^10-225*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-ta
n(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^8-45
0*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*
tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^6-450*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)
^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)
^4-225*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)
^2+2*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^2-45*a*b*pi*sign(tan(c/2)^2*tan(d*
x/2)^2-tan(c/2)^2+2*tan(c/2)*tan(d*x/2)^2+2*tan(c/2)+tan(d*x/2)^2-1)-45*a*b
*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c
```

/2)+tan(d*x/2)^2-1)*tan(c/2)^10*tan(d*x/2)^10-225*a*b*pi*sign(tan(c/2)^2*ta
n(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*ta
n(c/2)^10*tan(d*x/2)^8-450*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2
*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^10*tan(d*x/2)^6-
450*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-
2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^10*tan(d*x/2)^4-225*a*b*pi*sign(tan(c/2
)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2
-1)*tan(c/2)^10*tan(d*x/2)^2-45*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2
)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^10-225*a*b*
pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/
2)+tan(d*x/2)^2-1)*tan(c/2)^8*tan(d*x/2)^10-1125*a*b*pi*sign(tan(c/2)^2*tan
(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan
(c/2)^8*tan(d*x/2)^8-2250*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*
tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^8*tan(d*x/2)^6-22
50*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2
*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^8*tan(d*x/2)^4-1125*a*b*pi*sign(tan(c/2)
^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-
1)*tan(c/2)^8*tan(d*x/2)^2-225*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)
^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^8-450*a*b*pi
*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)
+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^10-2250*a*b*pi*sign(tan(c/2)^2*tan(d
*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c
/2)^6*tan(d*x/2)^8-4500*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*ta
n(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^6-4500
*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*t
an(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6*tan(d*x/2)^4-2250*a*b*pi*sign(tan(c/2)^2
*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)
*tan(c/2)^6*tan(d*x/2)^2-450*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2
-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^6-450*a*b*pi*s
ign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+t
an(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)^10-2250*a*b*pi*sign(tan(c/2)^2*tan(d*x
/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2
)^4*tan(d*x/2)^8-4500*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(
c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)^6-4500*a
*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan
(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4*tan(d*x/2)^4-2250*a*b*pi*sign(tan(c/2)^2*t
an(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*t
an(c/2)^4*tan(d*x/2)^2-450*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2
*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^4-225*a*b*pi*sig
n(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan
(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^10-1125*a*b*pi*sign(tan(c/2)^2*tan(d*x/2
)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^
2*tan(d*x/2)^8-2250*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/
2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^6-2250*a*b
*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c
/2)+tan(d*x/2)^2-1)*tan(c/2)^2*tan(d*x/2)^4-1125*a*b*pi*sign(tan(c/2)^2*tan
(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan
(c/2)^2*tan(d*x/2)^2-225*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*t
an(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(c/2)^2-45*a*b*pi*sign(t
an(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*
x/2)^2-1)*tan(d*x/2)^10-225*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-
2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^8-450*a*b*pi*
sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+
tan(d*x/2)^2-1)*tan(d*x/2)^6-450*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/
2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^4-225*a*
b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(
c/2)+tan(d*x/2)^2-1)*tan(d*x/2)^2-45*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-ta
n(c/2)^2-2*tan(c/2)*tan(d*x/2)^2-2*tan(c/2)+tan(d*x/2)^2-1)-60*a*b*pi*sign(
tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*ta

n(c/2)^10*tan(d*x/2)^10-300*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-
4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^10*tan(d*x/2)^8-600*a*b*pi*s
ign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1
)*tan(c/2)^10*tan(d*x/2)^6-600*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)
^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^10*tan(d*x/2)^4-300*a*b*p
i*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^
2+1)*tan(c/2)^10*tan(d*x/2)^2-60*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/
2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^10-300*a*b*pi*sign(tan(
c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/
2)^8*tan(d*x/2)^10-1500*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*ta
n(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^8*tan(d*x/2)^8-3000*a*b*pi*sign(
tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*ta
n(c/2)^8*tan(d*x/2)^6-3000*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4
*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^8*tan(d*x/2)^4-1500*a*b*pi*si
gn(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)
*tan(c/2)^8*tan(d*x/2)^2-300*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2
-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^8-600*a*b*pi*sign(tan(c/2)^
2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^6*
tan(d*x/2)^10-3000*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2
)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^6*tan(d*x/2)^8-6000*a*b*pi*sign(tan(c
/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2
)^6*tan(d*x/2)^6-6000*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(
c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^6*tan(d*x/2)^4-3000*a*b*pi*sign(ta
n(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(
c/2)^6*tan(d*x/2)^2-600*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*ta
n(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^6-600*a*b*pi*sign(tan(c/2)^2*tan
(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^4*tan(d
*x/2)^10-3000*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan
(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^4*tan(d*x/2)^8-6000*a*b*pi*sign(tan(c/2)^2
*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^4*t
an(d*x/2)^6-6000*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*
tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^4*tan(d*x/2)^4-3000*a*b*pi*sign(tan(c/2
)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^
4*tan(d*x/2)^2-600*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2
)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^4-300*a*b*pi*sign(tan(c/2)^2*tan(d*x/
2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^2*tan(d*x/2)
^10-1500*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/
2)-tan(d*x/2)^2+1)*tan(c/2)^2*tan(d*x/2)^8-3000*a*b*pi*sign(tan(c/2)^2*tan(
d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^2*tan(d*
x/2)^6-3000*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d
*x/2)-tan(d*x/2)^2+1)*tan(c/2)^2*tan(d*x/2)^4-1500*a*b*pi*sign(tan(c/2)^2*t
an(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^2*tan
(d*x/2)^2-300*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan
(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^2-60*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-t
an(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(d*x/2)^10-300*a*b*pi*si
gn(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)
*tan(d*x/2)^8-600*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)
*tan(d*x/2)-tan(d*x/2)^2+1)*tan(d*x/2)^6-600*a*b*pi*sign(tan(c/2)^2*tan(d*x
/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(d*x/2)^4-300*a*b
*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2
)^2+1)*tan(d*x/2)^2-60*a*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan
(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)-90*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+
tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^10*tan(
d*x/2)^10-450*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2
)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^10*tan(d*x/2)^8-900*a*b*atan(
(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-t
an(d*x/2)-1))*tan(c/2)^10*tan(d*x/2)^6-900*a*b*atan((tan(c/2)*tan(d*x/2)+ta
n(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^
10*tan(d*x/2)^4-450*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(t

an(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^10*tan(d*x/2)^2-90*a*b*
atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c
/2)-tan(d*x/2)-1))*tan(c/2)^10-450*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+t
an(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^8*tan(d*
x/2)^10-2250*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)
*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^8*tan(d*x/2)^8-4500*a*b*atan((
tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-ta
n(d*x/2)-1))*tan(c/2)^8*tan(d*x/2)^6-4500*a*b*atan((tan(c/2)*tan(d*x/2)+tan
(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^8
*tan(d*x/2)^4-2250*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(ta
n(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^8*tan(d*x/2)^2-450*a*b*a
tan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/
2)-tan(d*x/2)-1))*tan(c/2)^8-900*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan
(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^6*tan(d*x/
2)^10-4500*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*t
an(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^6*tan(d*x/2)^8-9000*a*b*atan((ta
n(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(
d*x/2)-1))*tan(c/2)^6*tan(d*x/2)^6-9000*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c
/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^6*t
an(d*x/2)^4-4500*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(
c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^6*tan(d*x/2)^2-900*a*b*ata
n((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)
-tan(d*x/2)-1))*tan(c/2)^6-900*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d
*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^4*tan(d*x/2)
^10-4500*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan
(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^4*tan(d*x/2)^8-9000*a*b*atan((tan(
c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*
x/2)-1))*tan(c/2)^4*tan(d*x/2)^6-9000*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2
)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^4*tan
(d*x/2)^4-4500*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/
2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^4*tan(d*x/2)^2-900*a*b*atan(
(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-t
an(d*x/2)-1))*tan(c/2)^4-450*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x
/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^2*tan(d*x/2)^1
0-2250*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d
*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^2*tan(d*x/2)^8-4500*a*b*atan((tan(c/
2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/
2)-1))*tan(c/2)^2*tan(d*x/2)^6-4500*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+
tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^2*tan(d
*x/2)^4-2250*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)
*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^2*tan(d*x/2)^2-450*a*b*atan((t
an(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan
(d*x/2)-1))*tan(c/2)^2-90*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)
-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(d*x/2)^10-450*a*b*atan
((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-
tan(d*x/2)-1))*tan(d*x/2)^8-900*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(
d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(d*x/2)^6-900*a*b
*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(
c/2)-tan(d*x/2)-1))*tan(d*x/2)^4-450*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)
+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(d*x/2)^2-90
*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-
tan(c/2)-tan(d*x/2)-1))+90*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2
)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^10*tan(d*x/2)^10
+450*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x
/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^10*tan(d*x/2)^8+900*a*b*atan((tan(c/2)
*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)
+1))*tan(c/2)^10*tan(d*x/2)^6+900*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-ta
n(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^10*tan(d*
x/2)^4+450*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*t

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an(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^10*tan(d*x/2)^2+90*a*b*atan((tan
(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d
*x/2)+1))*tan(c/2)^10+450*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)
+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^8*tan(d*x/2)^10+2
250*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/
2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^8*tan(d*x/2)^8+4500*a*b*atan((tan(c/2)*
tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+
1))*tan(c/2)^8*tan(d*x/2)^6+4500*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan
(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^8*tan(d*x/
2)^4+2250*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*ta
n(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^8*tan(d*x/2)^2+450*a*b*atan((tan(
c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*
x/2)+1))*tan(c/2)^8+900*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1
)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^6*tan(d*x/2)^10+450
0*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)
-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^6*tan(d*x/2)^8+9000*a*b*atan((tan(c/2)*ta
n(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)
)*tan(c/2)^6*tan(d*x/2)^6+9000*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d
*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^6*tan(d*x/2)
^4+4500*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(
d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^6*tan(d*x/2)^2+900*a*b*atan((tan(c/
2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/
2)+1))*tan(c/2)^6+900*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/
(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^4*tan(d*x/2)^10+4500*
a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-t
an(c/2)+tan(d*x/2)+1))*tan(c/2)^4*tan(d*x/2)^8+9000*a*b*atan((tan(c/2)*tan(
d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*
tan(c/2)^4*tan(d*x/2)^6+9000*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x
/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^4*tan(d*x/2)^4
+4500*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*
x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^4*tan(d*x/2)^2+900*a*b*atan((tan(c/2)
*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)
+1))*tan(c/2)^4+450*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(t
an(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^2*tan(d*x/2)^10+2250*a*
b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan
(c/2)+tan(d*x/2)+1))*tan(c/2)^2*tan(d*x/2)^8+4500*a*b*atan((tan(c/2)*tan(d*
x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*ta
n(c/2)^2*tan(d*x/2)^6+4500*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2
)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^2*tan(d*x/2)^4+2
250*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/
2)-tan(c/2)+tan(d*x/2)+1))*tan(c/2)^2*tan(d*x/2)^2+450*a*b*atan((tan(c/2)*t
an(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1
))*tan(c/2)^2+90*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(
c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(d*x/2)^10+450*a*b*atan((tan(c/2
)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2
)+1))*tan(d*x/2)^8+900*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)
/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(d*x/2)^6+900*a*b*atan((ta
n(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(
d*x/2)+1))*tan(d*x/2)^4+450*a*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/
2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1))*tan(d*x/2)^2+90*a*b*atan
((tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)-tan(c/2)+
tan(d*x/2)+1))+90*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan
(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^10*tan(d*x/2)^10+450*a*b*
atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c
/2)-tan(d*x/2)+1))*tan(c/2)^10*tan(d*x/2)^8+900*a*b*atan((tan(c/2)*tan(d*x/
2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(
c/2)^10*tan(d*x/2)^6+900*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+
1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^10*tan(d*x/2)^4+45
0*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)
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+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^10*tan(d*x/2)^2+90*a*b*atan((tan(c/2)*tan
(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))
*tan(c/2)^10+450*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(
c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^8*tan(d*x/2)^10+2250*a*b*a
tan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/
2)-tan(d*x/2)+1))*tan(c/2)^8*tan(d*x/2)^8+4500*a*b*atan((tan(c/2)*tan(d*x/2
)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c
/2)^8*tan(d*x/2)^6+4500*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1
)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^8*tan(d*x/2)^4+2250
*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+
tan(c/2)-tan(d*x/2)+1))*tan(c/2)^8*tan(d*x/2)^2+450*a*b*atan((tan(c/2)*tan(
d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*
tan(c/2)^8+900*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/
2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^6*tan(d*x/2)^10+4500*a*b*ata
n((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)
-tan(d*x/2)+1))*tan(c/2)^6*tan(d*x/2)^8+9000*a*b*atan((tan(c/2)*tan(d*x/2)-
tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2
)^6*tan(d*x/2)^6+9000*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/
(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^6*tan(d*x/2)^4+4500*a
*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+ta
n(c/2)-tan(d*x/2)+1))*tan(c/2)^6*tan(d*x/2)^2+900*a*b*atan((tan(c/2)*tan(d*
x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*ta
n(c/2)^6+900*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)
*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^4*tan(d*x/2)^10+4500*a*b*atan(
(tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-t
an(d*x/2)+1))*tan(c/2)^4*tan(d*x/2)^8+9000*a*b*atan((tan(c/2)*tan(d*x/2)-ta
n(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^
4*tan(d*x/2)^6+9000*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(t
an(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^4*tan(d*x/2)^4+4500*a*b
*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(
c/2)-tan(d*x/2)+1))*tan(c/2)^4*tan(d*x/2)^2+900*a*b*atan((tan(c/2)*tan(d*x/
2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(
c/2)^4+450*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*t
an(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^2*tan(d*x/2)^10+2250*a*b*atan((t
an(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan
(d*x/2)+1))*tan(c/2)^2*tan(d*x/2)^8+4500*a*b*atan((tan(c/2)*tan(d*x/2)-tan(
c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^2*
tan(d*x/2)^6+4500*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan
(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/2)^2*tan(d*x/2)^4+2250*a*b*a
tan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/
2)-tan(d*x/2)+1))*tan(c/2)^2*tan(d*x/2)^2+450*a*b*atan((tan(c/2)*tan(d*x/2)
-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(c/
2)^2+90*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(
d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(d*x/2)^10+450*a*b*atan((tan(c/2)*tan(d*x
/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan
(d*x/2)^8+900*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2
)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(d*x/2)^6+900*a*b*atan((tan(c/2)*ta
n(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1)
)*tan(d*x/2)^4+450*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(ta
n(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2)+1))*tan(d*x/2)^2+90*a*b*atan((tan(c/2
)*tan(d*x/2)-tan(c/2)+tan(d*x/2)+1)/(tan(c/2)*tan(d*x/2)+tan(c/2)-tan(d*x/2
)+1))-90*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan
(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^10*tan(d*x/2)^10-450*a*b*atan((tan
(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d
*x/2)-1))*tan(c/2)^10*tan(d*x/2)^8-900*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/
2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^10*t
an(d*x/2)^6-900*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c
/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^10*tan(d*x/2)^4-450*a*b*ata
n((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)
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+tan(d*x/2)-1))*tan(c/2)^10*tan(d*x/2)^2-90*a*b*atan((tan(c/2)*tan(d*x/2)-t
an(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)
^10-450*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(
d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^8*tan(d*x/2)^10-2250*a*b*atan((tan(
c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*
x/2)-1))*tan(c/2)^8*tan(d*x/2)^8-4500*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2
)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^8*tan
(d*x/2)^6-4500*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/
2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^8*tan(d*x/2)^4-2250*a*b*atan
((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+
tan(d*x/2)-1))*tan(c/2)^8*tan(d*x/2)^2-450*a*b*atan((tan(c/2)*tan(d*x/2)-ta
n(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^
8-900*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*
x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^6*tan(d*x/2)^10-4500*a*b*atan((tan(c/
2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/
2)-1))*tan(c/2)^6*tan(d*x/2)^8-9000*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-
tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^6*tan(d
*x/2)^6-9000*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)
*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^6*tan(d*x/2)^4-4500*a*b*atan((
tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+ta
n(d*x/2)-1))*tan(c/2)^6*tan(d*x/2)^2-900*a*b*atan((tan(c/2)*tan(d*x/2)-tan(
c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^6-
900*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/
2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^4*tan(d*x/2)^10-4500*a*b*atan((tan(c/2)
*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)
-1))*tan(c/2)^4*tan(d*x/2)^8-9000*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-ta
n(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^4*tan(d*x
/2)^6-9000*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*t
an(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^4*tan(d*x/2)^4-4500*a*b*atan((ta
n(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(
d*x/2)-1))*tan(c/2)^4*tan(d*x/2)^2-900*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/
2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^4-45
0*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)
+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^2*tan(d*x/2)^10-2250*a*b*atan((tan(c/2)*t
an(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1
))*tan(c/2)^2*tan(d*x/2)^8-4500*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(
d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^2*tan(d*x/2
)^6-4500*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan
(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^2*tan(d*x/2)^4-2250*a*b*atan((tan(
c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*
x/2)-1))*tan(c/2)^2*tan(d*x/2)^2-450*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)
-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^2-90*a
*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+ta
n(c/2)+tan(d*x/2)-1))*tan(d*x/2)^10-450*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c
/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(d*x/2)^8
-900*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x
/2)+tan(c/2)+tan(d*x/2)-1))*tan(d*x/2)^6-900*a*b*atan((tan(c/2)*tan(d*x/2)-
tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(d*x
/2)^4-450*a*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*ta
n(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(d*x/2)^2-90*a*b*atan((tan(c/2)*tan(d*x
/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))-384
*a*b*tan(c/2)^10*tan(d*x/2)^10+1920*a*b*tan(c/2)^10*tan(d*x/2)^8-3840*a*b*t
an(c/2)^10*tan(d*x/2)^6+3840*a*b*tan(c/2)^10*tan(d*x/2)^4-1920*a*b*tan(c/2)
^10*tan(d*x/2)^2+384*a*b*tan(c/2)^10+7680*a*b*tan(c/2)^9*tan(d*x/2)^9-30720
*a*b*tan(c/2)^9*tan(d*x/2)^7+46080*a*b*tan(c/2)^9*tan(d*x/2)^5-30720*a*b*ta
n(c/2)^9*tan(d*x/2)^3+7680*a*b*tan(c/2)^9*tan(d*x/2)+1920*a*b*tan(c/2)^8*ta
n(d*x/2)^10-71040*a*b*tan(c/2)^8*tan(d*x/2)^8+203520*a*b*tan(c/2)^8*tan(d*x
/2)^6-203520*a*b*tan(c/2)^8*tan(d*x/2)^4+71040*a*b*tan(c/2)^8*tan(d*x/2)^2-
1920*a*b*tan(c/2)^8-30720*a*b*tan(c/2)^7*tan(d*x/2)^9+368640*a*b*tan(c/2)^7
```

```
*tan(d*x/2)^7-675840*a*b*tan(c/2)^7*tan(d*x/2)^5+368640*a*b*tan(c/2)^7*tan(
d*x/2)^3-30720*a*b*tan(c/2)^7*tan(d*x/2)-3840*a*b*tan(c/2)^6*tan(d*x/2)^10+
203520*a*b*tan(c/2)^6*tan(d*x/2)^8-1082880*a*b*tan(c/2)^6*tan(d*x/2)^6+1082
880*a*b*tan(c/2)^6*tan(d*x/2)^4-203520*a*b*tan(c/2)^6*tan(d*x/2)^2+3840*a*b
*tan(c/2)^6+46080*a*b*tan(c/2)^5*tan(d*x/2)^9-675840*a*b*tan(c/2)^5*tan(d*x
/2)^7+1652736*a*b*tan(c/2)^5*tan(d*x/2)^5-675840*a*b*tan(c/2)^5*tan(d*x/2)^
3+46080*a*b*tan(c/2)^5*tan(d*x/2)+3840*a*b*tan(c/2)^4*tan(d*x/2)^10-203520*
a*b*tan(c/2)^4*tan(d*x/2)^8+1082880*a*b*tan(c/2)^4*tan(d*x/2)^6-1082880*a*b
*tan(c/2)^4*tan(d*x/2)^4+203520*a*b*tan(c/2)^4*tan(d*x/2)^2-3840*a*b*tan(c/
2)^4-30720*a*b*tan(c/2)^3*tan(d*x/2)^9+368640*a*b*tan(c/2)^3*tan(d*x/2)^7-6
75840*a*b*tan(c/2)^3*tan(d*x/2)^5+368640*a*b*tan(c/2)^3*tan(d*x/2)^3-30720*
a*b*tan(c/2)^3*tan(d*x/2)-1920*a*b*tan(c/2)^2*tan(d*x/2)^10+71040*a*b*tan(c
/2)^2*tan(d*x/2)^8-203520*a*b*tan(c/2)^2*tan(d*x/2)^6+203520*a*b*tan(c/2)^2
*tan(d*x/2)^4-71040*a*b*tan(c/2)^2*tan(d*x/2)^2+1920*a*b*tan(c/2)^2+7680*a*
b*tan(c/2)*tan(d*x/2)^9-30720*a*b*tan(c/2)*tan(d*x/2)^7+46080*a*b*tan(c/2)*
tan(d*x/2)^5-30720*a*b*tan(c/2)*tan(d*x/2)^3+7680*a*b*tan(c/2)*tan(d*x/2)+3
84*a*b*tan(d*x/2)^10-1920*a*b*tan(d*x/2)^8+3840*a*b*tan(d*x/2)^6-3840*a*b*t
an(d*x/2)^4+1920*a*b*tan(d*x/2)^2-384*a*b-2560*b^2*tan(c/2)^10*tan(d*x/2)^7
+1024*b^2*tan(c/2)^10*tan(d*x/2)^5-2560*b^2*tan(c/2)^10*tan(d*x/2)^3-7680*b
^2*tan(c/2)^9*tan(d*x/2)^8+23040*b^2*tan(c/2)^9*tan(d*x/2)^6-23040*b^2*tan(
c/2)^9*tan(d*x/2)^4+7680*b^2*tan(c/2)^9*tan(d*x/2)^2-7680*b^2*tan(c/2)^8*ta
n(d*x/2)^9+64000*b^2*tan(c/2)^8*tan(d*x/2)^7-133120*b^2*tan(c/2)^8*tan(d*x/
2)^5+64000*b^2*tan(c/2)^8*tan(d*x/2)^3-7680*b^2*tan(c/2)^8*tan(d*x/2)-2560*
b^2*tan(c/2)^7*tan(d*x/2)^10+64000*b^2*tan(c/2)^7*tan(d*x/2)^8-302080*b^2*t
an(c/2)^7*tan(d*x/2)^6+302080*b^2*tan(c/2)^7*tan(d*x/2)^4-64000*b^2*tan(c/2
)^7*tan(d*x/2)^2+2560*b^2*tan(c/2)^7+23040*b^2*tan(c/2)^6*tan(d*x/2)^9-3020
80*b^2*tan(c/2)^6*tan(d*x/2)^7+640000*b^2*tan(c/2)^6*tan(d*x/2)^5-302080*b^
2*tan(c/2)^6*tan(d*x/2)^3+23040*b^2*tan(c/2)^6*tan(d*x/2)+1024*b^2*tan(c/2)
^5*tan(d*x/2)^10-133120*b^2*tan(c/2)^5*tan(d*x/2)^8+640000*b^2*tan(c/2)^5*t
an(d*x/2)^6-640000*b^2*tan(c/2)^5*tan(d*x/2)^4+133120*b^2*tan(c/2)^5*tan(d*
x/2)^2-1024*b^2*tan(c/2)^5-23040*b^2*tan(c/2)^4*tan(d*x/2)^9+302080*b^2*tan
(c/2)^4*tan(d*x/2)^7-640000*b^2*tan(c/2)^4*tan(d*x/2)^5+302080*b^2*tan(c/2)
^4*tan(d*x/2)^3-23040*b^2*tan(c/2)^4*tan(d*x/2)-2560*b^2*tan(c/2)^3*tan(d*x
/2)^10+64000*b^2*tan(c/2)^3*tan(d*x/2)^8-302080*b^2*tan(c/2)^3*tan(d*x/2)^6
+302080*b^2*tan(c/2)^3*tan(d*x/2)^4-64000*b^2*tan(c/2)^3*tan(d*x/2)^2+2560*
b^2*tan(c/2)^3+7680*b^2*tan(c/2)^2*tan(d*x/2)^9-64000*b^2*tan(c/2)^2*tan(d*
x/2)^7+133120*b^2*tan(c/2)^2*tan(d*x/2)^5-64000*b^2*tan(c/2)^2*tan(d*x/2)^3
+7680*b^2*tan(c/2)^2*tan(d*x/2)-7680*b^2*tan(c/2)*tan(d*x/2)^8+23040*b^2*ta
n(c/2)*tan(d*x/2)^6-23040*b^2*tan(c/2)*tan(d*x/2)^4+7680*b^2*tan(c/2)*tan(d
*x/2)^2+2560*b^2*tan(d*x/2)^7-1024*b^2*tan(d*x/2)^5+2560*b^2*tan(d*x/2)^3)/
(960*d*tan(c/2)^10*tan(d*x/2)^10+4800*d*tan(c/2)^10*tan(d*x/2)^8+9600*d*tan
(c/2)^10*tan(d*x/2)^6+9600*d*tan(c/2)^10*tan(d*x/2)^4+4800*d*tan(c/2)^10*ta
n(d*x/2)^2+960*d*tan(c/2)^10+4800*d*tan(c/2)^8*tan(d*x/2)^10+24000*d*tan(c/
2)^8*tan(d*x/2)^8+48000*d*tan(c/2)^8*tan(d*x/2)^6+48000*d*tan(c/2)^8*tan(d*
x/2)^4+24000*d*tan(c/2)^8*tan(d*x/2)^2+4800*d*tan(c/2)^8+9600*d*tan(c/2)^6*
tan(d*x/2)^10+48000*d*tan(c/2)^6*tan(d*x/2)^8+96000*d*tan(c/2)^6*tan(d*x/2)
^6+96000*d*tan(c/2)^6*tan(d*x/2)^4+48000*d*tan(c/2)^6*tan(d*x/2)^2+9600*d*t
an(c/2)^6+9600*d*tan(c/2)^4*tan(d*x/2)^10+48000*d*tan(c/2)^4*tan(d*x/2)^8+9
6000*d*tan(c/2)^4*tan(d*x/2)^6+96000*d*tan(c/2)^4*tan(d*x/2)^4+48000*d*tan(
c/2)^4*tan(d*x/2)^2+9600*d*tan(c/2)^4+4800*d*tan(c/2)^2*tan(d*x/2)^10+24000
*d*tan(c/2)^2*tan(d*x/2)^8+48000*d*tan(c/2)^2*tan(d*x/2)^6+48000*d*tan(c/2)
^2*tan(d*x/2)^4+24000*d*tan(c/2)^2*tan(d*x/2)^2+4800*d*tan(c/2)^2+960*d*tan
(d*x/2)^10+4800*d*tan(d*x/2)^8+9600*d*tan(d*x/2)^6+9600*d*tan(d*x/2)^4+4800
*d*tan(d*x/2)^2+960*d)
```

maple [A] time = 0.50, size = 88, normalized size = 0.77

$$\frac{b^2\left(-\frac{\sin(dx+c)\left(\cos^4(dx+c)\right)}{5}+\frac{\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{15}\right)-\frac{2ab\left(\cos^5(dx+c)\right)}{5}+\frac{a^2\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{5}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^5*(a+b*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(b^2*(-1/5*sin(d*x+c)*cos(d*x+c)^4+1/15*(2+cos(d*x+c)^2)*sin(d*x+c))-2/
5*a*b*cos(d*x+c)^5+1/5*a^2*(8/3+cos(d*x+c)^4+4/3*cos(d*x+c)^2)*sin(d*x+c))
```

maxima [A] time = 0.33, size = 77, normalized size = 0.68

$$-\frac{6\,ab\cos\left(dx+c\right)^{5}-\left(3\,\sin\left(dx+c\right)^{5}-10\,\sin\left(dx+c\right)^{3}+15\,\sin\left(dx+c\right)\right)a^{2}+\left(3\,\sin\left(dx+c\right)^{5}-5\,\sin\left(dx+c\right)^{3}\right.}{15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/15*(6*a*b*cos(d*x + c)^5 - (3*sin(d*x + c)^5 - 10*sin(d*x + c)^3 + 15*si
n(d*x + c))*a^2 + (3*sin(d*x + c)^5 - 5*sin(d*x + c)^3)*b^2)/d
```

mupad [B] time = 3.77, size = 115, normalized size = 1.01

$$\frac{2\left(\frac{3\,\sin(c+d\,x)\,a^{2}\,\cos(c+d\,x)^{4}}{2}+2\,\sin\left(c+d\,x\right)\,a^{2}\cos\left(c+d\,x\right)^{2}+4\,\sin\left(c+d\,x\right)\,a^{2}-3\,a\,b\cos\left(c+d\,x\right)^{5}-\frac{3\,\sin(c+d\,x)\,b^{2}}{2}\right.}{15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^5*(a + b*tan(c + d*x))^2,x)
```

```
[Out] (2*(4*a^2*sin(c + d*x) + b^2*sin(c + d*x) + 2*a^2*cos(c + d*x)^2*sin(c + d*
x) + (3*a^2*cos(c + d*x)^4*sin(c + d*x))/2 + (b^2*cos(c + d*x)^2*sin(c + d*
x))/2 - (3*b^2*cos(c + d*x)^4*sin(c + d*x))/2 - 3*a*b*cos(c + d*x)^5))/(15*
d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(a+b\tan\left(c+dx\right)\right)^{2}\cos^{5}\left(c+dx\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**5*(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**2*cos(c + d*x)**5, x)
```

3.530 $\int \cos^7(c+dx)(a+b\tan(c+dx))^2\,dx$

Optimal. Leaf size=138

$$-\frac{\left(6a^2+b^2\right)\sin^7(c+dx)}{42d}+\frac{\left(6a^2+b^2\right)\sin^5(c+dx)}{10d}-\frac{\left(6a^2+b^2\right)\sin^3(c+dx)}{6d}+\frac{\left(6a^2+b^2\right)\sin(c+dx)}{6d}-\frac{5ab\cos^7(}{42}$$

```
[Out] -5/42*a*b*cos(d*x+c)^7/d+1/6*(6*a^2+b^2)*sin(d*x+c)/d-1/6*(6*a^2+b^2)*sin(d
*x+c)^3/d+1/10*(6*a^2+b^2)*sin(d*x+c)^5/d-1/42*(6*a^2+b^2)*sin(d*x+c)^7/d-1
/6*b*cos(d*x+c)^7*(a+b*tan(d*x+c))/d
```

Rubi [A] time = 0.11, antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3508, 3486, 2633}

$$-\frac{\left(6a^2+b^2\right)\sin^7(c+dx)}{42d}+\frac{\left(6a^2+b^2\right)\sin^5(c+dx)}{10d}-\frac{\left(6a^2+b^2\right)\sin^3(c+dx)}{6d}+\frac{\left(6a^2+b^2\right)\sin(c+dx)}{6d}-\frac{5ab\cos^7(}{42}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^7*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (-5*a*b*Cos[c + d*x]^7)/(42*d) + ((6*a^2 + b^2)*Sin[c + d*x])/(6*d) - ((6*a
^2 + b^2)*Sin[c + d*x]^3)/(6*d) + ((6*a^2 + b^2)*Sin[c + d*x]^5)/(10*d) - (
(6*a^2 + b^2)*Sin[c + d*x]^7)/(42*d) - (b*Cos[c + d*x]^7*(a + b*Tan[c + d*x
]))/(6*d)
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3508

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^2, x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(
m + 1)), x] + Dist[1/(m + 1), Int[(d*Sec[e + f*x])^m*(a^2*(m + 1) - b^2 + a
*b*(m + 2)*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, m}, x] && NeQ[a^2
 + b^2, 0] && NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \cos^7(c+dx)(a+b\tan(c+dx))^2\,dx &= -\frac{b\cos^7(c+dx)(a+b\tan(c+dx))}{6d}-\frac{1}{6}\int \cos^7(c+dx)\left(-6a^2-b^2-\right.\\ &= -\frac{5ab\cos^7(c+dx)}{42d}-\frac{b\cos^7(c+dx)(a+b\tan(c+dx))}{6d}-\frac{1}{6}\left(-6a^2-b\right.\\ &= -\frac{5ab\cos^7(c+dx)}{42d}-\frac{b\cos^7(c+dx)(a+b\tan(c+dx))}{6d}-\frac{\left(6a^2+b^2\right)S}{}\\ &= -\frac{5ab\cos^7(c+dx)}{42d}+\frac{\left(6a^2+b^2\right)\sin(c+dx)}{6d}-\frac{\left(6a^2+b^2\right)\sin^3(c+dx}{6d}\end{aligned}$$

Mathematica [A] time = 0.44, size = 154, normalized size = 1.12

$$-\frac{-3675a^2\sin(c+dx)-735a^2\sin(3(c+dx))-147a^2\sin(5(c+dx))-15a^2\sin(7(c+dx))+1050ab\cos(c+dx)}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^7*(a + b*Tan[c + d*x])^2,x]
```

```
[Out] -1/6720*(1050*a*b*Cos[c + d*x] + 630*a*b*Cos[3*(c + d*x)] + 210*a*b*Cos[5*(
c + d*x)] + 30*a*b*Cos[7*(c + d*x)] - 3675*a^2*Sin[c + d*x] - 525*b^2*Sin[c
 + d*x] - 735*a^2*Sin[3*(c + d*x)] + 35*b^2*Sin[3*(c + d*x)] - 147*a^2*Sin[
5*(c + d*x)] + 63*b^2*Sin[5*(c + d*x)] - 15*a^2*Sin[7*(c + d*x)] + 15*b^2*S
in[7*(c + d*x)])/d
```

fricas [A] time = 0.62, size = 94, normalized size = 0.68

$$-\frac{30\,ab\cos\left(dx+c\right)^{7}-\left(15\left(a^{2}-b^{2}\right)\cos\left(dx+c\right)^{6}+3\left(6\,a^{2}+b^{2}\right)\cos\left(dx+c\right)^{4}+4\left(6\,a^{2}+b^{2}\right)\cos\left(dx+c\right)^{2}+48\,a}{105\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -1/105*(30*a*b*cos(d*x + c)^7 - (15*(a^2 - b^2)*cos(d*x + c)^6 + 3*(6*a^2 +
 b^2)*cos(d*x + c)^4 + 4*(6*a^2 + b^2)*cos(d*x + c)^2 + 48*a^2 + 8*b^2)*sin
(d*x + c))/d
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.50, size = 108, normalized size = 0.78

$$\frac{b^2\left(-\frac{\sin(dx+c)\left(\cos^6(dx+c)\right)}{7}+\frac{\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{35}\right)-\frac{2ab\left(\cos^7(dx+c)\right)}{7}+\frac{a^2\left(\frac{16}{5}+\cos^6(dx+c)+\frac{6\left(\cos^4(dx+c)\right)}{5}+\frac{8\left(\cos^2(dx+c)\right)}{5}\right)}{7}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^7*(a+b*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(b^2*(-1/7*sin(d*x+c)*cos(d*x+c)^6+1/35*(8/3+cos(d*x+c)^4+4/3*cos(d*x+c
)^2)*sin(d*x+c))-2/7*a*b*cos(d*x+c)^7+1/7*a^2*(16/5+cos(d*x+c)^6+6/5*cos(d*
x+c)^4+8/5*cos(d*x+c)^2)*sin(d*x+c))
```

maxima [A] time = 0.33, size = 98, normalized size = 0.71

$$-\frac{30\,ab\cos\left(dx+c\right)^{7}+3\left(5\,\sin\left(dx+c\right)^{7}-21\,\sin\left(dx+c\right)^{5}+35\,\sin\left(dx+c\right)^{3}-35\,\sin\left(dx+c\right)\right)a^{2}-\left(15\,\sin\left(dx\right.\right.}{105\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/105*(30*a*b*cos(d*x + c)^7 + 3*(5*sin(d*x + c)^7 - 21*sin(d*x + c)^5 + 3
5*sin(d*x + c)^3 - 35*sin(d*x + c))*a^2 - (15*sin(d*x + c)^7 - 42*sin(d*x +
 c)^5 + 35*sin(d*x + c)^3)*b^2)/d
```

mupad [B] time = 3.84, size = 176, normalized size = 1.28

$$\frac{16\,a^2\,\sin\left(c+d\,x\right)}{35\,d}+\frac{8\,b^2\,\sin\left(c+d\,x\right)}{105\,d}+\frac{8\,a^2\,{\cos\left(c+d\,x\right)}^2\,\sin\left(c+d\,x\right)}{35\,d}+\frac{6\,a^2\,{\cos\left(c+d\,x\right)}^4\,\sin\left(c+d\,x\right)}{35\,d}+\frac{a^2\,\cos$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^7*(a + b*tan(c + d*x))^2,x)
```

```
[Out] (16*a^2*sin(c + d*x))/(35*d) + (8*b^2*sin(c + d*x))/(105*d) + (8*a^2*cos(c
+ d*x)^2*sin(c + d*x))/(35*d) + (6*a^2*cos(c + d*x)^4*sin(c + d*x))/(35*d)
+ (a^2*cos(c + d*x)^6*sin(c + d*x))/(7*d) + (4*b^2*cos(c + d*x)^2*sin(c + d
*x))/(105*d) + (b^2*cos(c + d*x)^4*sin(c + d*x))/(35*d) - (b^2*cos(c + d*x)
^6*sin(c + d*x))/(7*d) - (2*a*b*cos(c + d*x)^7)/(7*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+b\tan (c+dx))^2 \cos^7 (c+dx)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**7*(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**2*cos(c + d*x)**7, x)
```

3.531 $\int \sec^8(c+dx)(a+b\tan(c+dx))^3\,dx$

Optimal. Leaf size=194

$$\frac{a^3\tan(c+dx)}{d}+\frac{a\left(a^2+9b^2\right)\tan^7(c+dx)}{7d}+\frac{3a\left(a^2+3b^2\right)\tan^5(c+dx)}{5d}+\frac{a\left(a^2+b^2\right)\tan^3(c+dx)}{d}+\frac{3a^2b\sec^8(c+d$$

```
[Out] 3/8*a^2*b*sec(d*x+c)^8/d+a^3*tan(d*x+c)/d+a*(a^2+b^2)*tan(d*x+c)^3/d+1/4*b^
3*tan(d*x+c)^4/d+3/5*a*(a^2+3*b^2)*tan(d*x+c)^5/d+1/2*b^3*tan(d*x+c)^6/d+1/
7*a*(a^2+9*b^2)*tan(d*x+c)^7/d+3/8*b^3*tan(d*x+c)^8/d+1/3*a*b^2*tan(d*x+c)^
9/d+1/10*b^3*tan(d*x+c)^10/d
```

Rubi [A] time = 0.15, antiderivative size = 194, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3506, 696, 1810}

$$\frac{a\left(a^2+9b^2\right)\tan^7(c+dx)}{7d}+\frac{3a\left(a^2+3b^2\right)\tan^5(c+dx)}{5d}+\frac{a\left(a^2+b^2\right)\tan^3(c+dx)}{d}+\frac{3a^2b\sec^8(c+dx)}{8d}+\frac{a^3\tan(c+d}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^8*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (3*a^2*b*Sec[c + d*x]^8)/(8*d) + (a^3*Tan[c + d*x])/d + (a*(a^2 + b^2)*Tan[
c + d*x]^3)/d + (b^3*Tan[c + d*x]^4)/(4*d) + (3*a*(a^2 + 3*b^2)*Tan[c + d*x
]^5)/(5*d) + (b^3*Tan[c + d*x]^6)/(2*d) + (a*(a^2 + 9*b^2)*Tan[c + d*x]^7)/
(7*d) + (3*b^3*Tan[c + d*x]^8)/(8*d) + (a*b^2*Tan[c + d*x]^9)/(3*d) + (b^3*
Tan[c + d*x]^10)/(10*d)
```

Rule 696

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*m*d^(m - 1)*(a + c*x^2)^(p + 1))/(2*c*(p + 1)), x] + Int[((d + e*x)^m -
e*m*d^(m - 1)*x)*(a + c*x^2)^p, x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^2 +
 a*e^2, 0] && IGtQ[p, 1] && IGtQ[m, 0] && LeQ[m, p]
```

Rule 1810

```
Int[(Pq_)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[Pq*
(a + b*x^2)^p, x], x] /; FreeQ[{a, b}, x] && PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\int \sec^8(c+dx)(a+b\tan(c+dx))^3\,dx = \frac{\text{Subst}\left(\int (a+x)^3\left(1+\frac{x^2}{b^2}\right)^3 dx, x, b\tan(c+dx)\right)}{bd}$$

$$= \frac{3a^2b\sec^8(c+dx)}{8d} + \frac{\text{Subst}\left(\int \left(1+\frac{x^2}{b^2}\right)^3\left(-3a^2x+(a+x)^3\right) dx, x, b\,\text{ta}\right.}{bd}$$

$$= \frac{3a^2b\sec^8(c+dx)}{8d} + \frac{\text{Subst}\left(\int \left(a^3+\frac{3a(a^2+b^2)x^2}{b^2}+x^3+\frac{3a(a^2+3b^2)x^4}{b^4}+\right.\right.}{}$$

$$= \frac{3a^2b\sec^8(c+dx)}{8d} + \frac{a^3\tan(c+dx)}{d} + \frac{a\left(a^2+b^2\right)\tan^3(c+dx)}{d} + \frac{b^3\,\text{ta}}{}$$

Mathematica [A] time = 2.04, size = 177, normalized size = 0.91

$$\frac{\frac{3}{8}\left(5a^2+b^2\right)(a+b\tan(c+dx))^8-\frac{4}{7}a\left(5a^2+3b^2\right)(a+b\tan(c+dx))^7+\frac{1}{2}\left(a^2+b^2\right)\left(5a^2+b^2\right)(a+b\tan(c+}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^8*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (((a^2 + b^2)^3*(a + b*Tan[c + d*x])^4)/4 - (6*a*(a^2 + b^2)^2*(a + b*Tan[c
 + d*x])^5)/5 + ((a^2 + b^2)*(5*a^2 + b^2)*(a + b*Tan[c + d*x])^6)/2 - (4*a
*(5*a^2 + 3*b^2)*(a + b*Tan[c + d*x])^7)/7 + (3*(5*a^2 + b^2)*(a + b*Tan[c
+ d*x])^8)/8 - (2*a*(a + b*Tan[c + d*x])^9)/3 + (a + b*Tan[c + d*x])^10/10)
/(b^7*d)
```

fricas [A] time = 0.76, size = 150, normalized size = 0.77

$$\frac{84\,b^3+105\left(3\,a^2b-b^3\right)\cos(dx+c)^2+8\left(16\left(3\,a^3-ab^2\right)\cos(dx+c)^9+8\left(3\,a^3-ab^2\right)\cos(dx+c)^7+6\left(3\,a^3\right.\right.}{840\,d\cos(dx+c)^{10}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/840*(84*b^3 + 105*(3*a^2*b - b^3)*cos(d*x + c)^2 + 8*(16*(3*a^3 - a*b^2)*
cos(d*x + c)^9 + 8*(3*a^3 - a*b^2)*cos(d*x + c)^7 + 6*(3*a^3 - a*b^2)*cos(d
*x + c)^5 + 35*a*b^2*cos(d*x + c) + 5*(3*a^3 - a*b^2)*cos(d*x + c)^3)*sin(d
*x + c))/(d*cos(d*x + c)^10)
```

giac [A] time = 1.56, size = 220, normalized size = 1.13

$$\frac{84\,b^3\tan(dx+c)^{10}+280\,ab^2\tan(dx+c)^9+315\,a^2b\tan(dx+c)^8+315\,b^3\tan(dx+c)^8+120\,a^3\tan(dx+c)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/840*(84*b^3*tan(d*x + c)^10 + 280*a*b^2*tan(d*x + c)^9 + 315*a^2*b*tan(d*
x + c)^8 + 315*b^3*tan(d*x + c)^8 + 120*a^3*tan(d*x + c)^7 + 1080*a*b^2*tan
(d*x + c)^7 + 1260*a^2*b*tan(d*x + c)^6 + 420*b^3*tan(d*x + c)^6 + 504*a^3*
tan(d*x + c)^5 + 1512*a*b^2*tan(d*x + c)^5 + 1890*a^2*b*tan(d*x + c)^4 + 21
0*b^3*tan(d*x + c)^4 + 840*a^3*tan(d*x + c)^3 + 840*a*b^2*tan(d*x + c)^3 +
1260*a^2*b*tan(d*x + c)^2 + 840*a^3*tan(d*x + c))/d
```

maple [A] time = 0.46, size = 219, normalized size = 1.13

$$\frac{-a^3\left(-\frac{16}{35}-\frac{\left(\sec^6(dx+c)\right)}{7}-\frac{6\left(\sec^4(dx+c)\right)}{35}-\frac{8\left(\sec^2(dx+c)\right)}{35}\right)\tan\left(dx+c\right)+\frac{3a^2b}{8\cos(dx+c)^8}+3b^2a\left(\frac{\sin^3(dx+c)}{9\cos(dx+c)^9}+\frac{2\left(\sin^3(dx+c)\right)}{21\cos(dx+c)^7}+\dots\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^8*(a+b*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(-a^3*(-16/35-1/7*sec(d*x+c)^6-6/35*sec(d*x+c)^4-8/35*sec(d*x+c)^2)*tan
(d*x+c)+3/8*a^2*b/cos(d*x+c)^8+3*b^2*a*(1/9*sin(d*x+c)^3/cos(d*x+c)^9+2/21*
sin(d*x+c)^3/cos(d*x+c)^7+8/105*sin(d*x+c)^3/cos(d*x+c)^5+16/315*sin(d*x+c)
^3/cos(d*x+c)^3)+b^3*(1/10*sin(d*x+c)^4/cos(d*x+c)^10+3/40*sin(d*x+c)^4/cos
(d*x+c)^8+1/20*sin(d*x+c)^4/cos(d*x+c)^6+1/40*sin(d*x+c)^4/cos(d*x+c)^4))
```

maxima [A] time = 0.36, size = 176, normalized size = 0.91

$$\frac{84\,b^3\tan\left(dx+c\right)^{10}+280\,ab^2\tan\left(dx+c\right)^9+315\left(a^2b+b^3\right)\tan\left(dx+c\right)^8+120\left(a^3+9\,ab^2\right)\tan\left(dx+c\right)^7+420\dots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8*(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/840*(84*b^3*tan(d*x + c)^10 + 280*a*b^2*tan(d*x + c)^9 + 315*(a^2*b + b^3
)*tan(d*x + c)^8 + 120*(a^3 + 9*a*b^2)*tan(d*x + c)^7 + 420*(3*a^2*b + b^3)
*tan(d*x + c)^6 + 504*(a^3 + 3*a*b^2)*tan(d*x + c)^5 + 1260*a^2*b*tan(d*x +
 c)^2 + 210*(9*a^2*b + b^3)*tan(d*x + c)^4 + 840*a^3*tan(d*x + c) + 840*(a^
3 + a*b^2)*tan(d*x + c)^3)/d
```

mupad [B] time = 3.68, size = 175, normalized size = 0.90

$$\frac{\tan\left(c+d\,x\right)^5\,\left(\frac{3\,a^3}{5}+\frac{9\,a\,b^2}{5}\right)+\tan\left(c+d\,x\right)^7\,\left(\frac{a^3}{7}+\frac{9\,a\,b^2}{7}\right)+\tan\left(c+d\,x\right)^6\,\left(\frac{3\,a^2\,b}{2}+\frac{b^3}{2}\right)+\tan\left(c+d\,x\right)^4\,\left(\frac{9\,a^2\,b}{4}+\frac{b^3}{4}\right)\dots}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))^3/cos(c + d*x)^8,x)
```

```
[Out] (tan(c + d*x)^5*((9*a*b^2)/5 + (3*a^3)/5) + tan(c + d*x)^7*((9*a*b^2)/7 + a
^3/7) + tan(c + d*x)^6*((3*a^2*b)/2 + b^3/2) + tan(c + d*x)^4*((9*a^2*b)/4
+ b^3/4) + a^3*tan(c + d*x) + (b^3*tan(c + d*x)^10)/10 + (3*a^2*b*tan(c + d
*x)^2)/2 + (a*b^2*tan(c + d*x)^9)/3 + a*tan(c + d*x)^3*(a^2 + b^2) + (3*b*t
an(c + d*x)^8*(a^2 + b^2))/8)/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(a+b\tan\left(c+dx\right)\right)^3\sec^8\left(c+dx\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8*(a+b*tan(d*x+c))**3,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**3*sec(c + d*x)**8, x)
```

3.532 $\int \sec^6(c+dx)(a+b\tan(c+dx))^3\,dx$

Optimal. Leaf size=138

$$\frac{(3a^2+b^2)(a+b\tan(c+dx))^6}{3b^5d}-\frac{4a(a^2+b^2)(a+b\tan(c+dx))^5}{5b^5d}+\frac{(a^2+b^2)^2(a+b\tan(c+dx))^4}{4b^5d}+\frac{(a+b\tan(}{8b^5}$$

```
[Out] 1/4*(a^2+b^2)^2*(a+b*tan(d*x+c))^4/b^5/d-4/5*a*(a^2+b^2)*(a+b*tan(d*x+c))^5
/b^5/d+1/3*(3*a^2+b^2)*(a+b*tan(d*x+c))^6/b^5/d-4/7*a*(a+b*tan(d*x+c))^7/b^
5/d+1/8*(a+b*tan(d*x+c))^8/b^5/d
```

Rubi [A] time = 0.13, antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {3506, 697}

$$\frac{(3a^2+b^2)(a+b\tan(c+dx))^6}{3b^5d}-\frac{4a(a^2+b^2)(a+b\tan(c+dx))^5}{5b^5d}+\frac{(a^2+b^2)^2(a+b\tan(c+dx))^4}{4b^5d}+\frac{(a+b\tan(}{8b^5}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] ((a^2 + b^2)^2*(a + b*Tan[c + d*x])^4)/(4*b^5*d) - (4*a*(a^2 + b^2)*(a + b*
Tan[c + d*x])^5)/(5*b^5*d) + ((3*a^2 + b^2)*(a + b*Tan[c + d*x])^6)/(3*b^5*
d) - (4*a*(a + b*Tan[c + d*x])^7)/(7*b^5*d) + (a + b*Tan[c + d*x])^8/(8*b^5
*d)
```

Rule 697

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m},
 x] && NeQ[c*d^2 + a*e^2, 0] && IGtQ[p, 0]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^6(c+dx)(a+b\tan(c+dx))^3\,dx &= \frac{\text{Subst}\left(\int (a+x)^3\left(1+\frac{x^2}{b^2}\right)^2 dx, x, b\tan(c+dx)\right)}{bd}\\ &= \frac{\text{Subst}\left(\int\left(\frac{(a^2+b^2)^2(a+x)^3}{b^4}-\frac{4a(a^2+b^2)(a+x)^4}{b^4}+\frac{2(3a^2+b^2)(a+x)^5}{b^4}-\frac{4a(a+x)^6}{b^4}+\right.\right.}{bd}\\ &= \frac{(a^2+b^2)^2(a+b\tan(c+dx))^4}{4b^5d}-\frac{4a(a^2+b^2)(a+b\tan(c+dx))^5}{5b^5d}+\end{aligned}$$

Mathematica [A] time = 0.57, size = 115, normalized size = 0.83

$$\frac{\frac{1}{3}(3a^2+b^2)(a+b\tan(c+dx))^6-\frac{4}{5}a(a^2+b^2)(a+b\tan(c+dx))^5+\frac{1}{4}(a^2+b^2)^2(a+b\tan(c+dx))^4+\frac{1}{8}(a+}{b^5d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (((a^2 + b^2)^2*(a + b*Tan[c + d*x])^4)/4 - (4*a*(a^2 + b^2)*(a + b*Tan[c +
 d*x])^5)/5 + ((3*a^2 + b^2)*(a + b*Tan[c + d*x])^6)/3 - (4*a*(a + b*Tan[c
+ d*x])^7)/7 + (a + b*Tan[c + d*x])^8/8)/(b^5*d)
```

fricas [A] time = 0.78, size = 128, normalized size = 0.93

$$\frac{105\,b^3+140\left(3\,a^2b-b^3\right)\cos\left(dx+c\right)^2+8\left(8\left(7\,a^3-3\,ab^2\right)\cos\left(dx+c\right)^7+4\left(7\,a^3-3\,ab^2\right)\cos\left(dx+c\right)^5+45\,ab^2\right.}{840\,d\cos\left(dx+c\right)^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/840*(105*b^3 + 140*(3*a^2*b - b^3)*cos(d*x + c)^2 + 8*(8*(7*a^3 - 3*a*b^2
)*cos(d*x + c)^7 + 4*(7*a^3 - 3*a*b^2)*cos(d*x + c)^5 + 45*a*b^2*cos(d*x +
c) + 3*(7*a^3 - 3*a*b^2)*cos(d*x + c)^3)*sin(d*x + c))/(d*cos(d*x + c)^8)
```

giac [A] time = 2.72, size = 166, normalized size = 1.20

$$\frac{105\,b^3\tan\left(dx+c\right)^8+360\,ab^2\tan\left(dx+c\right)^7+420\,a^2b\tan\left(dx+c\right)^6+280\,b^3\tan\left(dx+c\right)^6+168\,a^3\tan\left(dx+c\right)^5-}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/840*(105*b^3*tan(d*x + c)^8 + 360*a*b^2*tan(d*x + c)^7 + 420*a^2*b*tan(d*
x + c)^6 + 280*b^3*tan(d*x + c)^6 + 168*a^3*tan(d*x + c)^5 + 1008*a*b^2*tan
(d*x + c)^5 + 1260*a^2*b*tan(d*x + c)^4 + 210*b^3*tan(d*x + c)^4 + 560*a^3*
tan(d*x + c)^3 + 840*a*b^2*tan(d*x + c)^3 + 1260*a^2*b*tan(d*x + c)^2 + 840
*a^3*tan(d*x + c))/d
```

maple [A] time = 0.46, size = 173, normalized size = 1.25

$$\frac{-a^3\left(-\frac{8}{15}-\frac{\left(\sec^4(dx+c)\right)}{5}-\frac{4\left(\sec^2(dx+c)\right)}{15}\right)\tan\left(dx+c\right)+\frac{a^2b}{2\cos(dx+c)^6}+3b^2a\left(\frac{\sin^3(dx+c)}{7\cos(dx+c)^7}+\frac{4\left(\sin^3(dx+c)\right)}{35\cos(dx+c)^5}+\frac{8\left(\sin^3(dx+c)\right)}{105\cos(dx+c)^3}\right)+}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6*(a+b*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(-a^3*(-8/15-1/5*sec(d*x+c)^4-4/15*sec(d*x+c)^2)*tan(d*x+c)+1/2*a^2*b/c
os(d*x+c)^6+3*b^2*a*(1/7*sin(d*x+c)^3/cos(d*x+c)^7+4/35*sin(d*x+c)^3/cos(d*
x+c)^5+8/105*sin(d*x+c)^3/cos(d*x+c)^3)+b^3*(1/8*sin(d*x+c)^4/cos(d*x+c)^8+
1/12*sin(d*x+c)^4/cos(d*x+c)^6+1/24*sin(d*x+c)^4/cos(d*x+c)^4))
```

maxima [A] time = 0.33, size = 142, normalized size = 1.03

$$\frac{105\,b^3\tan\left(dx+c\right)^8+360\,ab^2\tan\left(dx+c\right)^7+140\left(3\,a^2b+2\,b^3\right)\tan\left(dx+c\right)^6+168\left(a^3+6\,ab^2\right)\tan\left(dx+c\right)^5+1}{840\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/840*(105*b^3*tan(d*x + c)^8 + 360*a*b^2*tan(d*x + c)^7 + 140*(3*a^2*b + 2
*b^3)*tan(d*x + c)^6 + 168*(a^3 + 6*a*b^2)*tan(d*x + c)^5 + 1260*a^2*b*tan(
```

```
d*x + c)^2 + 210*(6*a^2*b + b^3)*tan(d*x + c)^4 + 840*a^3*tan(d*x + c) + 28
0*(2*a^3 + 3*a*b^2)*tan(d*x + c)^3)/d
```

mupad [B] time = 3.60, size = 139, normalized size = 1.01

$$\frac{\tan(c+d\,x)^3\,\left(\frac{2\,a^3}{3}+a\,b^2\right)+\tan(c+d\,x)^5\,\left(\frac{a^3}{5}+\frac{6\,a\,b^2}{5}\right)+\tan(c+d\,x)^6\,\left(\frac{a^2\,b}{2}+\frac{b^3}{3}\right)+\tan(c+d\,x)^4\,\left(\frac{3\,a^2\,b}{2}+\frac{b^3}{4}\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))^3/cos(c + d*x)^6,x)
```

```
[Out] (tan(c + d*x)^3*(a*b^2 + (2*a^3)/3) + tan(c + d*x)^5*((6*a*b^2)/5 + a^3/5)
+ tan(c + d*x)^6*((a^2*b)/2 + b^3/3) + tan(c + d*x)^4*((3*a^2*b)/2 + b^3/4)
 + a^3*tan(c + d*x) + (b^3*tan(c + d*x)^8)/8 + (3*a^2*b*tan(c + d*x)^2)/2 +
 (3*a*b^2*tan(c + d*x)^7)/7)/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+b\tan(c+dx))^3\sec^6(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6*(a+b*tan(d*x+c))**3,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**3*sec(c + d*x)**6, x)
```

3.533 $\int \sec^4(c+dx)(a+b\tan(c+dx))^3\,dx$

Optimal. Leaf size=75

$$\frac{(a^2+b^2)(a+b\tan(c+dx))^4}{4b^3d}+\frac{(a+b\tan(c+dx))^6}{6b^3d}-\frac{2a(a+b\tan(c+dx))^5}{5b^3d}$$

```
[Out] 1/4*(a^2+b^2)*(a+b*tan(d*x+c))^4/b^3/d-2/5*a*(a+b*tan(d*x+c))^5/b^3/d+1/6*(
a+b*tan(d*x+c))^6/b^3/d
```

Rubi [A] time = 0.07, antiderivative size = 75, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {3506, 697}

$$\frac{(a^2+b^2)(a+b\tan(c+dx))^4}{4b^3d}+\frac{(a+b\tan(c+dx))^6}{6b^3d}-\frac{2a(a+b\tan(c+dx))^5}{5b^3d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] ((a^2 + b^2)*(a + b*Tan[c + d*x])^4)/(4*b^3*d) - (2*a*(a + b*Tan[c + d*x])^
5)/(5*b^3*d) + (a + b*Tan[c + d*x])^6/(6*b^3*d)
```

Rule 697

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m},
 x] && NeQ[c*d^2 + a*e^2, 0] && IGtQ[p, 0]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^4(c+dx)(a+b\tan(c+dx))^3\,dx&=\frac{\text{Subst}\left(\int (a+x)^3\left(1+\frac{x^2}{b^2}\right)dx,x,b\tan(c+dx)\right)}{bd}\\&=\frac{\text{Subst}\left(\int \left(\frac{(a^2+b^2)(a+x)^3}{b^2}-\frac{2a(a+x)^4}{b^2}+\frac{(a+x)^5}{b^2}\right)dx,x,b\tan(c+dx)\right)}{bd}\\&=\frac{(a^2+b^2)(a+b\tan(c+dx))^4}{4b^3d}-\frac{2a(a+b\tan(c+dx))^5}{5b^3d}+\frac{(a+b\tan(c+dx))^6}{6b^3d}\end{aligned}$$

Mathematica [A] time = 0.34, size = 54, normalized size = 0.72

$$\frac{(a+b\tan(c+dx))^4\left(a^2-4ab\tan(c+dx)+10b^2\tan^2(c+dx)+15b^2\right)}{60b^3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] ((a + b*Tan[c + d*x])^4*(a^2 + 15*b^2 - 4*a*b*Tan[c + d*x] + 10*b^2*Tan[c +
 d*x]^2))/(60*b^3*d)
```

fricas [A] time = 0.65, size = 105, normalized size = 1.40

$$\frac{10 b^3 + 15 \left(3 a^2 b - b^3\right) \cos\left(dx + c\right)^2 + 4 \left(2 \left(5 a^3 - 3 ab^2\right) \cos\left(dx + c\right)^5 + 9 ab^2 \cos\left(dx + c\right) + \left(5 a^3 - 3 ab^2\right) \cos\right.}{60 d \cos\left(dx + c\right)^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/60*(10*b^3 + 15*(3*a^2*b - b^3)*cos(d*x + c)^2 + 4*(2*(5*a^3 - 3*a*b^2)*c
os(d*x + c)^5 + 9*a*b^2*cos(d*x + c) + (5*a^3 - 3*a*b^2)*cos(d*x + c)^3)*si
n(d*x + c))/(d*cos(d*x + c)^6)
```

giac [A] time = 1.36, size = 112, normalized size = 1.49

$$\frac{10 b^3 \tan\left(dx + c\right)^6 + 36 ab^2 \tan\left(dx + c\right)^5 + 45 a^2 b \tan\left(dx + c\right)^4 + 15 b^3 \tan\left(dx + c\right)^4 + 20 a^3 \tan\left(dx + c\right)^3 + 60}{60 d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/60*(10*b^3*tan(d*x + c)^6 + 36*a*b^2*tan(d*x + c)^5 + 45*a^2*b*tan(d*x +
c)^4 + 15*b^3*tan(d*x + c)^4 + 20*a^3*tan(d*x + c)^3 + 60*a*b^2*tan(d*x + c
)^3 + 90*a^2*b*tan(d*x + c)^2 + 60*a^3*tan(d*x + c))/d
```

maple [A] time = 0.43, size = 127, normalized size = 1.69

$$\frac{-a^3 \left(-\frac{2}{3} - \frac{\left(\sec^2(dx+c)\right)}{3}\right) \tan\left(dx + c\right) + \frac{3a^2 b}{4 \cos(dx+c)^4} + 3b^2 a \left(\frac{\sin^3(dx+c)}{5 \cos(dx+c)^5} + \frac{2\left(\sin^3(dx+c)\right)}{15 \cos(dx+c)^3}\right) + b^3 \left(\frac{\sin^4(dx+c)}{6 \cos(dx+c)^6} + \frac{\sin^4(dx+c}{12 \cos(dx+c}\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4*(a+b*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(-a^3*(-2/3-1/3*sec(d*x+c)^2)*tan(d*x+c)+3/4*a^2*b/cos(d*x+c)^4+3*b^2*a
*(1/5*sin(d*x+c)^3/cos(d*x+c)^5+2/15*sin(d*x+c)^3/cos(d*x+c)^3)+b^3*(1/6*si
n(d*x+c)^4/cos(d*x+c)^6+1/12*sin(d*x+c)^4/cos(d*x+c)^4))
```

maxima [A] time = 0.38, size = 98, normalized size = 1.31

$$\frac{10 b^3 \tan\left(dx + c\right)^6 + 36 ab^2 \tan\left(dx + c\right)^5 + 90 a^2 b \tan\left(dx + c\right)^2 + 15 \left(3 a^2 b + b^3\right) \tan\left(dx + c\right)^4 + 60 a^3 \tan(dx}{60 d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/60*(10*b^3*tan(d*x + c)^6 + 36*a*b^2*tan(d*x + c)^5 + 90*a^2*b*tan(d*x +
c)^2 + 15*(3*a^2*b + b^3)*tan(d*x + c)^4 + 60*a^3*tan(d*x + c) + 20*(a^3 +
3*a*b^2)*tan(d*x + c)^3)/d
```

mupad [B] time = 3.57, size = 97, normalized size = 1.29

$$\frac{\tan\left(c + d\,x\right)^3 \left(\frac{a^3}{3} + a\,b^2\right) + \tan\left(c + d\,x\right)^4 \left(\frac{3\,a^2\,b}{4} + \frac{b^3}{4}\right) + a^3 \tan\left(c + d\,x\right) + \frac{b^3 \tan(c+d\,x)^6}{6} + \frac{3\,a^2\,b \tan(c+d\,x)^2}{2} + \frac{3\,a\,b^2\,t}{}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))^3/cos(c + d*x)^4,x)
```

```
[Out] (tan(c + d*x)^3*(a*b^2 + a^3/3) + tan(c + d*x)^4*((3*a^2*b)/4 + b^3/4) + a^
3*tan(c + d*x) + (b^3*tan(c + d*x)^6)/6 + (3*a^2*b*tan(c + d*x)^2)/2 + (3*a
*b^2*tan(c + d*x)^5)/5)/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a + b\tan (c + dx))^3 \sec^4 (c + dx)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4*(a+b*tan(d*x+c))**3,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**3*sec(c + d*x)**4, x)
```

3.534 $\int \sec^2(c+dx)(a+b\tan(c+dx))^3\,dx$

Optimal. Leaf size=22

$$\frac{(a+b\tan(c+dx))^4}{4bd}$$

```
[Out] 1/4*(a+b*tan(d*x+c))^4/b/d
```

Rubi [A] time = 0.04, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {3506, 32}

$$\frac{(a+b\tan(c+dx))^4}{4bd}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (a + b*Tan[c + d*x])^4/(4*b*d)
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^2(c+dx)(a+b\tan(c+dx))^3\,dx &= \frac{\text{Subst}\left(\int (a+x)^3\,dx, x, b\tan(c+dx)\right)}{bd}\\ &= \frac{(a+b\tan(c+dx))^4}{4bd}\end{aligned}$$

Mathematica [B] time = 0.16, size = 57, normalized size = 2.59

$$\frac{\tan(c+dx)\left(4a^3+6a^2b\tan(c+dx)+4ab^2\tan^2(c+dx)+b^3\tan^3(c+dx)\right)}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (Tan[c + d*x]*(4*a^3 + 6*a^2*b*Tan[c + d*x] + 4*a*b^2*Tan[c + d*x]^2 + b^3*
Tan[c + d*x]^3))/(4*d)
```

fricas [B] time = 0.82, size = 78, normalized size = 3.55

$$\frac{b^3+2\left(3\,a^2b-b^3\right)\cos\left(dx+c\right)^2+4\left(ab^2\cos\left(dx+c\right)+\left(a^3-ab^2\right)\cos\left(dx+c\right)^3\right)\sin\left(dx+c\right)}{4\,d\cos\left(dx+c\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/4*(b^3 + 2*(3*a^2*b - b^3)*cos(d*x + c)^2 + 4*(a*b^2*cos(d*x + c) + (a^3
- a*b^2)*cos(d*x + c)^3)*sin(d*x + c))/(d*cos(d*x + c)^4)
```

giac [B] time = 0.96, size = 57, normalized size = 2.59

$$\frac{b^3 \tan(dx+c)^4 + 4\,ab^2 \tan(dx+c)^3 + 6\,a^2 b \tan(dx+c)^2 + 4\,a^3 \tan(dx+c)}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/4*(b^3*tan(d*x + c)^4 + 4*a*b^2*tan(d*x + c)^3 + 6*a^2*b*tan(d*x + c)^2 +
 4*a^3*tan(d*x + c))/d
```

maple [B] time = 0.43, size = 72, normalized size = 3.27

$$\frac{a^3 \tan(dx+c) + \frac{3a^2 b}{2\cos(dx+c)^2} + \frac{b^2 a\left(\sin^3(dx+c)\right)}{\cos(dx+c)^3} + \frac{b^3\left(\sin^4(dx+c)\right)}{4\cos(dx+c)^4}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2*(a+b*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(a^3*tan(d*x+c)+3/2*a^2*b/cos(d*x+c)^2+b^2*a*sin(d*x+c)^3/cos(d*x+c)^3+
1/4*b^3*sin(d*x+c)^4/cos(d*x+c)^4)
```

maxima [A] time = 0.34, size = 20, normalized size = 0.91

$$\frac{(b\tan(dx+c)+a)^4}{4\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/4*(b*tan(d*x + c) + a)^4/(b*d)
```

mupad [B] time = 3.57, size = 55, normalized size = 2.50

$$\frac{a^3 \tan(c+d\,x) + \frac{3\,a^2\,b\tan(c+d\,x)^2}{2} + a\,b^2 \tan(c+d\,x)^3 + \frac{b^3\tan(c+d\,x)^4}{4}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))^3/cos(c + d*x)^2,x)
```

```
[Out] (a^3*tan(c + d*x) + (b^3*tan(c + d*x)^4)/4 + (3*a^2*b*tan(c + d*x)^2)/2 + a
*b^2*tan(c + d*x)^3)/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+b\tan(c+dx))^3 \sec^2(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2*(a+b*tan(d*x+c))**3,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**3*sec(c + d*x)**2, x)
```

3.535 $\int \cos^2(c+dx)(a+b\tan(c+dx))^3\,dx$

Optimal. Leaf size=86

$$\frac{1}{2}ax\left(a^2+3b^2\right)-\frac{ab^2\tan(c+dx)}{2d}-\frac{\cos^2(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))^2}{2d}-\frac{b^3\log(\cos(c+dx))}{d}$$

```
[Out] 1/2*a*(a^2+3*b^2)*x-b^3*ln(cos(d*x+c))/d-1/2*a*b^2*tan(d*x+c)/d-1/2*cos(d*x
+c)^2*(b-a*tan(d*x+c))*(a+b*tan(d*x+c))^2/d
```

Rubi [A] time = 0.09, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {3506, 739, 774, 635, 203, 260}

$$\frac{1}{2}ax\left(a^2+3b^2\right)-\frac{ab^2\tan(c+dx)}{2d}-\frac{\cos^2(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))^2}{2d}-\frac{b^3\log(\cos(c+dx))}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (a*(a^2 + 3*b^2)*x)/2 - (b^3*Log[Cos[c + d*x]])/d - (a*b^2*Tan[c + d*x])/(2
*d) - (Cos[c + d*x]^2*(b - a*Tan[c + d*x])*(a + b*Tan[c + d*x])^2)/(2*d)
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 739

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m - 1)*(a*e - c*d*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)), x] +
 Dist[1/((p + 1)*(-2*a*c)), Int[(d + e*x)^(m - 2)*Simp[a*e^2*(m - 1) - c*d^
2*(2*p + 3) - d*c*e*(m + 2*p + 2)*x, x]*(a + c*x^2)^(p + 1), x], x] /; Free
Q[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && I
ntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 774

```
Int[(((d_.) + (e_.)*(x_))*((f_) + (g_.)*(x_)))/((a_) + (c_.)*(x_)^2), x_Sym
bol] :> Simp[(e*g*x)/c, x] + Dist[1/c, Int[(c*d*f - a*e*g + c*(e*f + d*g)*x
)/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e, f, g}, x]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
```

```
] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^2(c+dx)(a+b\tan(c+dx))^3\,dx = \frac{\text{Subst}\left(\int \frac{(a+x)^3}{\left(1+\frac{x^2}{b^2}\right)^2}\,dx, x, b\tan(c+dx)\right)}{bd}$$

$$= -\frac{\cos^2(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))^2}{2d} + \frac{b\,\text{Subst}\left(\int \frac{(a+x)(}{}\right.}{}$$

$$= -\frac{ab^2\tan(c+dx)}{2d} - \frac{\cos^2(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))^2}{2d}$$

$$= -\frac{ab^2\tan(c+dx)}{2d} - \frac{\cos^2(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))^2}{2d}$$

$$= \frac{1}{2}a\left(a^2+3b^2\right)x - \frac{b^3\log(\cos(c+dx))}{d} - \frac{ab^2\tan(c+dx)}{2d} - \frac{\cos^2(c+dx)(}{}$$

Mathematica [B] time = 0.78, size = 401, normalized size = 4.66

$$\frac{-a^5\sqrt{-b^2}\log\left(\sqrt{-b^2}-b\tan(c+dx)\right)+a^5\sqrt{-b^2}\log\left(\sqrt{-b^2}+b\tan(c+dx)\right)+5a^4b^2+4a^3\left(-b^2\right)^{3/2}\log\left(\sqrt{-b^2}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (5*a^4*b^2 + 2*a^2*b^4 - b^6 + (-3*a^4*b^2 - 2*a^2*b^4 + b^6)*Cos[2*(c + d*
x)] + 2*a^2*b^4*Log[Sqrt[-b^2] - b*Tan[c + d*x]] + 2*b^6*Log[Sqrt[-b^2] - b
*Tan[c + d*x]] - a^5*Sqrt[-b^2]*Log[Sqrt[-b^2] - b*Tan[c + d*x]] + 4*a^3*(-
b^2)^(3/2)*Log[Sqrt[-b^2] - b*Tan[c + d*x]] - 3*a*(-b^2)^(5/2)*Log[Sqrt[-b^
2] - b*Tan[c + d*x]] + 2*a^2*b^4*Log[Sqrt[-b^2] + b*Tan[c + d*x]] + 2*b^6*L
og[Sqrt[-b^2] + b*Tan[c + d*x]] + a^5*Sqrt[-b^2]*Log[Sqrt[-b^2] + b*Tan[c +
 d*x]] + 3*a*b^4*Sqrt[-b^2]*Log[Sqrt[-b^2] + b*Tan[c + d*x]] - 4*a^3*(-b^2)
^(3/2)*Log[Sqrt[-b^2] + b*Tan[c + d*x]] + a*b*(a^4 - 2*a^2*b^2 - 3*b^4)*Sin
[2*(c + d*x)])/(4*b*(a^2 + b^2)*d)
```

fricas [A] time = 0.77, size = 79, normalized size = 0.92

$$-\frac{2\,b^3\log\left(-\cos\left(dx+c\right)\right)-\left(a^3+3\,ab^2\right)dx+\left(3\,a^2b-b^3\right)\cos\left(dx+c\right)^2-\left(a^3-3\,ab^2\right)\cos\left(dx+c\right)\sin\left(dx+c\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] -1/2*(2*b^3*log(-cos(d*x + c)) - (a^3 + 3*a*b^2)*d*x + (3*a^2*b - b^3)*cos(
d*x + c)^2 - (a^3 - 3*a*b^2)*cos(d*x + c)*sin(d*x + c))/d
```

giac [B] time = 3.93, size = 601, normalized size = 6.99

$$\frac{2\,a^3dx\tan(dx)^2\tan(c)^2+6\,ab^2dx\tan(dx)^2\tan(c)^2-2\,b^3\log\left(\frac{4\left(\tan(dx)^4\tan(c)^2-2\,\tan(dx)^3\tan(c)+\tan(dx)^2\tan(c)^2+\tan(d\right.}{\tan(c)^2+1}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/4*(2*a^3*d*x*tan(d*x)^2*tan(c)^2 + 6*a*b^2*d*x*tan(d*x)^2*tan(c)^2 - 2*b^
3*log(4*(tan(d*x)^4*tan(c)^2 - 2*tan(d*x)^3*tan(c) + tan(d*x)^2*tan(c)^2 +
tan(d*x)^2 - 2*tan(d*x)*tan(c) + 1)/(tan(c)^2 + 1))*tan(d*x)^2*tan(c)^2 + 2
*a^3*d*x*tan(d*x)^2 + 6*a*b^2*d*x*tan(d*x)^2 + 2*a^3*d*x*tan(c)^2 + 6*a*b^2
*d*x*tan(c)^2 - 3*a^2*b*tan(d*x)^2*tan(c)^2 + b^3*tan(d*x)^2*tan(c)^2 - 2*b
^3*log(4*(tan(d*x)^4*tan(c)^2 - 2*tan(d*x)^3*tan(c) + tan(d*x)^2*tan(c)^2 +
 tan(d*x)^2 - 2*tan(d*x)*tan(c) + 1)/(tan(c)^2 + 1))*tan(d*x)^2 - 2*a^3*tan
(d*x)^2*tan(c) + 6*a*b^2*tan(d*x)^2*tan(c) - 2*b^3*log(4*(tan(d*x)^4*tan(c)
^2 - 2*tan(d*x)^3*tan(c) + tan(d*x)^2*tan(c)^2 + tan(d*x)^2 - 2*tan(d*x)*ta
n(c) + 1)/(tan(c)^2 + 1))*tan(c)^2 - 2*a^3*tan(d*x)*tan(c)^2 + 6*a*b^2*tan(
d*x)*tan(c)^2 + 2*a^3*d*x + 6*a*b^2*d*x + 3*a^2*b*tan(d*x)^2 - b^3*tan(d*x)
^2 + 12*a^2*b*tan(d*x)*tan(c) - 4*b^3*tan(d*x)*tan(c) + 3*a^2*b*tan(c)^2 -
b^3*tan(c)^2 - 2*b^3*log(4*(tan(d*x)^4*tan(c)^2 - 2*tan(d*x)^3*tan(c) + tan
(d*x)^2*tan(c)^2 + tan(d*x)^2 - 2*tan(d*x)*tan(c) + 1)/(tan(c)^2 + 1)) + 2*
a^3*tan(d*x) - 6*a*b^2*tan(d*x) + 2*a^3*tan(c) - 6*a*b^2*tan(c) - 3*a^2*b +
 b^3)/(d*tan(d*x)^2*tan(c)^2 + d*tan(d*x)^2 + d*tan(c)^2 + d)
```

maple [A] time = 0.31, size = 123, normalized size = 1.43

$$\frac{a^3\cos(dx+c)\sin(dx+c)}{2d}+\frac{a^3x}{2}+\frac{a^3c}{2d}-\frac{3a^2\left(\cos^2(dx+c)\right)b}{2d}-\frac{3a\,b^2\cos(dx+c)\sin(dx+c)}{2d}+\frac{3a\,b^2x}{2}+\frac{3a\,b^2c}{2d}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2*(a+b*tan(d*x+c))^3,x)
```

```
[Out] 1/2*a^3*cos(d*x+c)*sin(d*x+c)/d+1/2*a^3*x+1/2/d*a^3*c-3/2/d*a^2*cos(d*x+c)^
2*b-3/2*a*b^2*cos(d*x+c)*sin(d*x+c)/d+3/2*a*b^2*x+3/2/d*a*b^2*c-1/2/d*sin(d
*x+c)^2*b^3-b^3*ln(cos(d*x+c))/d
```

maxima [A] time = 0.43, size = 81, normalized size = 0.94

$$\frac{b^3\log\left(\tan(dx+c)^2+1\right)+\left(a^3+3\,ab^2\right)(dx+c)-\frac{3\,a^2b-b^3-\left(a^3-3\,ab^2\right)\tan(dx+c)}{\tan(dx+c)^2+1}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/2*(b^3*log(tan(d*x + c)^2 + 1) + (a^3 + 3*a*b^2)*(d*x + c) - (3*a^2*b - b
^3 - (a^3 - 3*a*b^2)*tan(d*x + c))/(tan(d*x + c)^2 + 1))/d
```

mupad [B] time = 3.66, size = 141, normalized size = 1.64

$$\frac{b^3\,\ln\left(\frac{1}{\cos(c+d\,x)^2}\right)}{2\,d}+\frac{b^3\cos(c+d\,x)^2}{2\,d}+\frac{a^3\,\mathrm{atan}\left(\frac{\sin(c+d\,x)}{\cos(c+d\,x)}\right)}{2\,d}-\frac{3\,a^2\,b\cos(c+d\,x)^2}{2\,d}+\frac{3\,a\,b^2\,\mathrm{atan}\left(\frac{\sin(c+d\,x)}{\cos(c+d\,x)}\right)}{2\,d}+\frac{a^3\,\cos}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2*(a + b*tan(c + d*x))^3,x)
```

```
[Out] (b^3*log(1/cos(c + d*x)^2))/(2*d) + (b^3*cos(c + d*x)^2)/(2*d) + (a^3*atan(
sin(c + d*x)/cos(c + d*x)))/(2*d) - (3*a^2*b*cos(c + d*x)^2)/(2*d) + (3*a*b
^2*atan(sin(c + d*x)/cos(c + d*x)))/(2*d) + (a^3*cos(c + d*x)*sin(c + d*x))
/(2*d) - (3*a*b^2*cos(c + d*x)*sin(c + d*x))/(2*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a + b\tan(c + dx))^3 \cos^2(c + dx)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2*(a+b*tan(d*x+c))**3,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**3*cos(c + d*x)**2, x)
```

3.536 $\int \cos^4(c+dx)(a+b\tan(c+dx))^3\,dx$

Optimal. Leaf size=84

$$\frac{3}{8}ax\left(a^2+b^2\right)-\frac{3a\cos^2(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))}{8d}+\frac{\sin(c+dx)\cos^3(c+dx)(a+b\tan(c+d$$

```
[Out] 3/8*a*(a^2+b^2)*x-3/8*a*cos(d*x+c)^2*(b-a*tan(d*x+c))*(a+b*tan(d*x+c))/d+1/
4*cos(d*x+c)^3*sin(d*x+c)*(a+b*tan(d*x+c))^3/d
```

Rubi [A] time = 0.07, antiderivative size = 84, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {3506, 729, 723, 203}

$$\frac{3}{8}ax\left(a^2+b^2\right)-\frac{3a\cos^2(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))}{8d}+\frac{\sin(c+dx)\cos^3(c+dx)(a+b\tan(c+d$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (3*a*(a^2 + b^2)*x)/8 - (3*a*Cos[c + d*x]^2*(b - a*Tan[c + d*x])*(a + b*Tan
[c + d*x]))/(8*d) + (Cos[c + d*x]^3*Sin[c + d*x]*(a + b*Tan[c + d*x])^3)/(4
*d)
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 723

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m - 1)*(a*e - c*d*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)), x] +
 Dist[((2*p + 3)*(c*d^2 + a*e^2))/(2*a*c*(p + 1)), Int[(d + e*x)^(m - 2)*(a
 + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0
] && EqQ[m + 2*p + 2, 0] && LtQ[p, -1]
```

Rule 729

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^m*(2*c*x)*(a + c*x^2)^(p + 1))/(4*a*c*(p + 1)), x] - Dist[(m*(2
*c*d))/(4*a*c*(p + 1)), Int[(d + e*x)^(m - 1)*(a + c*x^2)^(p + 1), x], x] /
; FreeQ[{a, c, d, e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[m + 2*p + 3,
 0] && LtQ[p, -1]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^4(c+dx)(a+b\tan(c+dx))^3\,dx = \frac{\text{Subst}\left(\int \frac{(a+x)^3}{\left(1+\frac{x^2}{b^2}\right)^3}\,dx, x, b\tan(c+dx)\right)}{bd}$$

$$= \frac{\cos^3(c+dx)\sin(c+dx)(a+b\tan(c+dx))^3}{4d} + \frac{(3a)\,\text{Subst}\left(\int \frac{(a+x)^2}{\left(1+\frac{x^2}{b^2}\right)^2}\,dx,\right.}{4bd}$$

$$= -\frac{3a\cos^2(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))}{8d} + \frac{\cos^3(c+dx)\,\mathrm{si}}{}$$

$$= \frac{3}{8}a\left(a^2+b^2\right)x - \frac{3a\cos^2(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))}{8d} +$$

Mathematica [B] time = 3.58, size = 257, normalized size = 3.06

$$\frac{-24a^4b^4\tan^2(c+dx) - 3a\sqrt{-b^2}\left(a^2+b^2\right)^3\left(\log\left(\sqrt{-b^2}-b\tan(c+dx)\right) - \log\left(\sqrt{-b^2}+b\tan(c+dx)\right)\right) + 8a^2b^2}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (-3*a*Sqrt[-b^2]*(a^2 + b^2)^3*(Log[Sqrt[-b^2] - b*Tan[c + d*x]] - Log[Sqrt
[-b^2] + b*Tan[c + d*x]]) - 6*a*b^3*(6*a^4 + 3*a^2*b^2 + b^4)*Tan[c + d*x]
- 24*a^4*b^4*Tan[c + d*x]^2 + 2*a*b^5*(-3*a^2 + b^2)*Tan[c + d*x]^3 + 4*b*(
a^2 + b^2)*(a*Cos[c + d*x] + b*Sin[c + d*x])^4*(b + a*Tan[c + d*x]) + 8*a^2
*b^2*Cos[c + d*x]^2*(a + b*Tan[c + d*x])^4 + 2*a*b*(3*a^2 - b^2)*Cos[c + d*
x]*Sin[c + d*x]*(a + b*Tan[c + d*x])^4)/(16*b*(a^2 + b^2)^2*d)
```

fricas [A] time = 0.69, size = 100, normalized size = 1.19

$$-\frac{4\,b^3\cos\left(dx+c\right)^2 + 2\left(3\,a^2b-b^3\right)\cos\left(dx+c\right)^4 - 3\left(a^3+ab^2\right)dx - \left(2\left(a^3-3\,ab^2\right)\cos\left(dx+c\right)^3 + 3\left(a^3+ab^2\right)\mathrm{co}\right.}{8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] -1/8*(4*b^3*cos(d*x + c)^2 + 2*(3*a^2*b - b^3)*cos(d*x + c)^4 - 3*(a^3 + a*
b^2)*d*x - (2*(a^3 - 3*a*b^2)*cos(d*x + c)^3 + 3*(a^3 + a*b^2)*cos(d*x + c)
)*sin(d*x + c))/d
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError >> Unable to parse Giac output: Unabl
e to check sign: (2*pi/x/2)>(-2*pi/x/2)Unable to check sign: (2*pi/x/2)>(-2
*pi/x/2)Unable to check sign: (2*pi/x/2)>(-2*pi/x/2)Unable to check sign: (
2*pi/x/2)>(-2*pi/x/2)Unable to check sign: (2*pi/x/2)>(-2*pi/x/2)Unable to
```

check sign: (2*pi/x/2)>(-2*pi/x/2)Unable to check sign: (2*pi/x/2)>(-2*pi/x
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2*pi/x/2)Unable to check sign: (2*pi/x/2)>(-2*pi/x/2)Unable to check sign:
(2*pi/x/2)>(-2*pi/x/2)Unable to check sign: (2*pi/x/2)>(-2*pi/x/2)Unable to
check sign: (2*pi/x/2)>(-2*pi/x/2)Unable to check sign: (2*pi/x/2)>(-2*pi/
x/2)(24*a^3*d*x*tan(c)^4*tan(d*x)^4+48*a^3*d*x*tan(c)^4*tan(d*x)^2+24*a^3*d
*x*tan(c)^4+48*a^3*d*x*tan(c)^2*tan(d*x)^4+96*a^3*d*x*tan(c)^2*tan(d*x)^2+4
8*a^3*d*x*tan(c)^2+24*a^3*d*x*tan(d*x)^4+48*a^3*d*x*tan(d*x)^2+24*a^3*d*x-4
0*a^3*tan(c)^4*tan(d*x)^3-24*a^3*tan(c)^4*tan(d*x)-40*a^3*tan(c)^3*tan(d*x)
^4+48*a^3*tan(c)^3*tan(d*x)^2+24*a^3*tan(c)^3+48*a^3*tan(c)^2*tan(d*x)^3-48
*a^3*tan(c)^2*tan(d*x)-24*a^3*tan(c)*tan(d*x)^4-48*a^3*tan(c)*tan(d*x)^2+40
*a^3*tan(c)+24*a^3*tan(d*x)^3+40*a^3*tan(d*x)-30*a^2*b*tan(c)^4*tan(d*x)^4+
36*a^2*b*tan(c)^4*tan(d*x)^2+18*a^2*b*tan(c)^4+192*a^2*b*tan(c)^3*tan(d*x)^
3+36*a^2*b*tan(c)^2*tan(d*x)^4-216*a^2*b*tan(c)^2*tan(d*x)^2+36*a^2*b*tan(c
)^2+192*a^2*b*tan(c)*tan(d*x)+18*a^2*b*tan(d*x)^4+36*a^2*b*tan(d*x)^2-30*a^
2*b+24*a*b^2*d*x*tan(c)^4*tan(d*x)^4+48*a*b^2*d*x*tan(c)^4*tan(d*x)^2+24*a*
b^2*d*x*tan(c)^4+48*a*b^2*d*x*tan(c)^2*tan(d*x)^4+96*a*b^2*d*x*tan(c)^2*tan
(d*x)^2+48*a*b^2*d*x*tan(c)^2+24*a*b^2*d*x*tan(d*x)^4+48*a*b^2*d*x*tan(d*x)
^2+24*a*b^2*d*x+9*a*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^2-2*t
an(c)+2*tan(d*x))*sign(2*tan(c)^2*tan(d*x)^2-2)*tan(c)^4*tan(d*x)^4+18*a*b^
2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^2-2*tan(c)+2*tan(d*x))*sign
(2*tan(c)^2*tan(d*x)^2-2)*tan(c)^4*tan(d*x)^2+9*a*b^2*pi*sign(2*tan(c)^2*ta
n(d*x)-2*tan(c)*tan(d*x)^2-2*tan(c)+2*tan(d*x))*sign(2*tan(c)^2*tan(d*x)^2-
2)*tan(c)^4+18*a*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^2-2*tan(
c)+2*tan(d*x))*sign(2*tan(c)^2*tan(d*x)^2-2)*tan(c)^2*tan(d*x)^4+36*a*b^2*p
i*sign(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^2-2*tan(c)+2*tan(d*x))*sign(2*
tan(c)^2*tan(d*x)^2-2)*tan(c)^2*tan(d*x)^2+18*a*b^2*pi*sign(2*tan(c)^2*tan(
d*x)-2*tan(c)*tan(d*x)^2-2*tan(c)+2*tan(d*x))*sign(2*tan(c)^2*tan(d*x)^2-2)
*tan(c)^2+9*a*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^2-2*tan(c)+
2*tan(d*x))*sign(2*tan(c)^2*tan(d*x)^2-2)*tan(d*x)^4+18*a*b^2*pi*sign(2*tan
(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^2-2*tan(c)+2*tan(d*x))*sign(2*tan(c)^2*tan
(d*x)^2-2)*tan(d*x)^2+9*a*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*x)
^2-2*tan(c)+2*tan(d*x))*sign(2*tan(c)^2*tan(d*x)^2-2)+9*a*b^2*pi*sign(2*tan
(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^2-2*tan(c)+2*tan(d*x))*tan(c)^4*tan(d*x)^4
+18*a*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^2-2*tan(c)+2*tan(d*
x))*tan(c)^4*tan(d*x)^2+9*a*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*
x)^2-2*tan(c)+2*tan(d*x))*tan(c)^4+18*a*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*t
an(c)*tan(d*x)^2-2*tan(c)+2*tan(d*x))*tan(c)^2*tan(d*x)^4+36*a*b^2*pi*sign(
2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^2-2*tan(c)+2*tan(d*x))*tan(c)^2*tan(d
*x)^2+18*a*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^2-2*tan(c)+2*t
an(d*x))*tan(c)^2+9*a*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan(c)*tan(d*x)^2-2
*tan(c)+2*tan(d*x))*tan(d*x)^4+18*a*b^2*pi*sign(2*tan(c)^2*tan(d*x)-2*tan(c
)*tan(d*x)^2-2*tan(c)+2*tan(d*x))*tan(d*x)^2+9*a*b^2*pi*sign(2*tan(c)^2*tan
(d*x)-2*tan(c)*tan(d*x)^2-2*tan(c)+2*tan(d*x))+18*a*b^2*atan((tan(c)+tan(d*
x))/(tan(c)*tan(d*x)-1))*tan(c)^4*tan(d*x)^4+36*a*b^2*atan((tan(c)+tan(d*x)
)/(tan(c)*tan(d*x)-1))*tan(c)^4*tan(d*x)^2+18*a*b^2*atan((tan(c)+tan(d*x))/

```
(tan(c)*tan(d*x)-1))*tan(c)^4+36*a*b^2*atan((tan(c)+tan(d*x))/(tan(c)*tan(d
*x)-1))*tan(c)^2*tan(d*x)^4+72*a*b^2*atan((tan(c)+tan(d*x))/(tan(c)*tan(d*x
)-1))*tan(c)^2*tan(d*x)^2+36*a*b^2*atan((tan(c)+tan(d*x))/(tan(c)*tan(d*x)-
1))*tan(c)^2+18*a*b^2*atan((tan(c)+tan(d*x))/(tan(c)*tan(d*x)-1))*tan(d*x)^
4+36*a*b^2*atan((tan(c)+tan(d*x))/(tan(c)*tan(d*x)-1))*tan(d*x)^2+18*a*b^2*
atan((tan(c)+tan(d*x))/(tan(c)*tan(d*x)-1))-18*a*b^2*atan((tan(c)-tan(d*x))
/(tan(c)*tan(d*x)+1))*tan(c)^4*tan(d*x)^4-36*a*b^2*atan((tan(c)-tan(d*x))/(
tan(c)*tan(d*x)+1))*tan(c)^4*tan(d*x)^2-18*a*b^2*atan((tan(c)-tan(d*x))/(ta
n(c)*tan(d*x)+1))*tan(c)^4-36*a*b^2*atan((tan(c)-tan(d*x))/(tan(c)*tan(d*x)
+1))*tan(c)^2*tan(d*x)^4-72*a*b^2*atan((tan(c)-tan(d*x))/(tan(c)*tan(d*x)+1
))*tan(c)^2*tan(d*x)^2-36*a*b^2*atan((tan(c)-tan(d*x))/(tan(c)*tan(d*x)+1))
*tan(c)^2-18*a*b^2*atan((tan(c)-tan(d*x))/(tan(c)*tan(d*x)+1))*tan(d*x)^4-3
6*a*b^2*atan((tan(c)-tan(d*x))/(tan(c)*tan(d*x)+1))*tan(d*x)^2-18*a*b^2*ata
n((tan(c)-tan(d*x))/(tan(c)*tan(d*x)+1))+24*a*b^2*tan(c)^4*tan(d*x)^3-24*a*
b^2*tan(c)^4*tan(d*x)+24*a*b^2*tan(c)^3*tan(d*x)^4-144*a*b^2*tan(c)^3*tan(d
*x)^2+24*a*b^2*tan(c)^3-144*a*b^2*tan(c)^2*tan(d*x)^3+144*a*b^2*tan(c)^2*ta
n(d*x)-24*a*b^2*tan(c)*tan(d*x)^4+144*a*b^2*tan(c)*tan(d*x)^2-24*a*b^2*tan(
c)+24*a*b^2*tan(d*x)^3-24*a*b^2*tan(d*x)-6*b^3*tan(c)^4*tan(d*x)^4-12*b^3*t
an(c)^4*tan(d*x)^2+10*b^3*tan(c)^4+64*b^3*tan(c)^3*tan(d*x)-12*b^3*tan(c)^2
*tan(d*x)^4+72*b^3*tan(c)^2*tan(d*x)^2-12*b^3*tan(c)^2+64*b^3*tan(c)*tan(d*
x)^3+10*b^3*tan(d*x)^4-12*b^3*tan(d*x)^2-6*b^3)/(64*d*tan(c)^4*tan(d*x)^4+1
28*d*tan(c)^4*tan(d*x)^2+64*d*tan(c)^4+128*d*tan(c)^2*tan(d*x)^4+256*d*tan(
c)^2*tan(d*x)^2+128*d*tan(c)^2+64*d*tan(d*x)^4+128*d*tan(d*x)^2+64*d)
```

maple [A] time = 0.47, size = 114, normalized size = 1.36

$$\frac{\frac{b^{3}\left(\sin^{4}(dx+c)\right)}{4}+3b^{2}a\left(-\frac{\left(\cos^{3}(dx+c)\right)\sin(dx+c)}{4}+\frac{\cos(dx+c)\sin(dx+c)}{8}+\frac{dx}{8}+\frac{c}{8}\right)-\frac{3a^{2}b\left(\cos^{4}(dx+c)\right)}{4}+a^{3}\left(\frac{\left(\cos^{3}(dx+c)+\frac{3\cos(dx+c)}{2}\right)\mathrm{si}}{4}\right.}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4*(a+b*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(1/4*b^3*sin(d*x+c)^4+3*b^2*a*(-1/4*cos(d*x+c)^3*sin(d*x+c)+1/8*cos(d*x
+c)*sin(d*x+c)+1/8*d*x+1/8*c)-3/4*a^2*b*cos(d*x+c)^4+a^3*(1/4*(cos(d*x+c)^3
+3/2*cos(d*x+c))*sin(d*x+c)+3/8*d*x+3/8*c))
```

maxima [A] time = 0.44, size = 110, normalized size = 1.31

$$\frac{3\left(a^{3}+ab^{2}\right)(dx+c)-\frac{4\,b^{3}\tan(dx+c)^{2}-3\left(a^{3}+ab^{2}\right)\tan(dx+c)^{3}+6\,a^{2}b+2\,b^{3}-\left(5\,a^{3}-3\,ab^{2}\right)\tan(dx+c)}{\tan(dx+c)^{4}+2\,\tan(dx+c)^{2}+1}}{8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/8*(3*(a^3 + a*b^2)*(d*x + c) - (4*b^3*tan(d*x + c)^2 - 3*(a^3 + a*b^2)*ta
n(d*x + c)^3 + 6*a^2*b + 2*b^3 - (5*a^3 - 3*a*b^2)*tan(d*x + c))/(tan(d*x +
 c)^4 + 2*tan(d*x + c)^2 + 1))/d
```

mupad [B] time = 3.80, size = 109, normalized size = 1.30

$$\frac{3\,a^3\,x}{8}-\frac{6\,a^2\,b-{\tan\left(c+d\,x\right)}^3\,\left(3\,a^3+3\,a\,b^2\right)+2\,b^3+\tan\left(c+d\,x\right)\,\left(3\,a\,b^2-5\,a^3\right)+4\,b^3\,{\tan\left(c+d\,x\right)}^2}{d\,\left(8\,{\tan\left(c+d\,x\right)}^4+16\,{\tan\left(c+d\,x\right)}^2+8\right)}+\frac{3\,a\,b^2\,x}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4*(a + b*tan(c + d*x))^3,x)
```

```
[Out] (3*a^3*x)/8 - (6*a^2*b - tan(c + d*x)^3*(3*a*b^2 + 3*a^3) + 2*b^3 + tan(c +
 d*x)*(3*a*b^2 - 5*a^3) + 4*b^3*tan(c + d*x)^2)/(d*(16*tan(c + d*x)^2 + 8*t
an(c + d*x)^4 + 8)) + (3*a*b^2*x)/8
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int (a + b\tan(c + dx))^3 \cos^4(c + dx)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4*(a+b*tan(d*x+c))**3,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**3*cos(c + d*x)**4, x)
```

3.537 $\int \sec^5(c+dx)(a+b\tan(c+dx))^3\,dx$

Optimal. Leaf size=159

$$\frac{3a\left(2a^2-b^2\right)\tanh^{-1}(\sin(c+dx))}{16d}+\frac{b\sec^5(c+dx)\left(4\left(8a^2-b^2\right)+15ab\tan(c+dx)\right)}{70d}+\frac{a\left(2a^2-b^2\right)\tan(c+dx)\sec}{8d}$$

```
[Out] 3/16*a*(2*a^2-b^2)*arctanh(sin(d*x+c))/d+3/16*a*(2*a^2-b^2)*sec(d*x+c)*tan(
d*x+c)/d+1/8*a*(2*a^2-b^2)*sec(d*x+c)^3*tan(d*x+c)/d+1/7*b*sec(d*x+c)^5*(a+
b*tan(d*x+c))^2/d+1/70*b*sec(d*x+c)^5*(32*a^2-4*b^2+15*a*b*tan(d*x+c))/d
```

Rubi [A] time = 0.14, antiderivative size = 177, normalized size of antiderivative = 1.11, number of steps used = 6, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$, Rules used = {3512, 743, 780, 195, 215}

$$\frac{b\sec^5(c+dx)\left(4\left(8a^2-b^2\right)+15ab\tan(c+dx)\right)}{70d}+\frac{a\left(2a^2-b^2\right)\tan(c+dx)\sec^3(c+dx)}{8d}+\frac{3a\left(2a^2-b^2\right)\tan(c+dx}{16d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^5*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (3*a*(2*a^2 - b^2)*ArcSinh[Tan[c + d*x]]*Sec[c + d*x])/(16*d*Sqrt[Sec[c + d
*x]^2]) + (3*a*(2*a^2 - b^2)*Sec[c + d*x]*Tan[c + d*x])/(16*d) + (a*(2*a^2
- b^2)*Sec[c + d*x]^3*Tan[c + d*x])/(8*d) + (b*Sec[c + d*x]^5*(a + b*Tan[c
+ d*x])^2)/(7*d) + (b*Sec[c + d*x]^5*(4*(8*a^2 - b^2) + 15*a*b*Tan[c + d*x]
))/(70*d)
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 743

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m - 1)*(a + c*x^2)^(p + 1))/(c*(m + 2*p + 1)), x] + Dist[1/(c
*(m + 2*p + 1)), Int[(d + e*x)^(m - 2)*Simp[c*d^2*(m + 2*p + 1) - a*e^2*(m
- 1) + 2*c*d*e*(m + p)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m,
 p}, x] && NeQ[c*d^2 + a*e^2, 0] && If[RationalQ[m], GtQ[m, 1], SumSimplerQ
[m, -2]] && NeQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 780

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[(((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*(a + c*x^2)^(p
+ 1))/(2*c*(p + 1)*(2*p + 3)), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \sec^5(c+dx)(a+b\tan(c+dx))^3\,dx = \frac{\sec(c+dx)\,\text{Subst}\left(\int (a+x)^3\left(1+\frac{x^2}{b^2}\right)^{3/2}dx,x,b\tan(c+dx)\right)}{bd\sqrt{\sec^2(c+dx)}}$$

$$= \frac{b\sec^5(c+dx)(a+b\tan(c+dx))^2}{7d} + \frac{(b\sec(c+dx))\,\text{Subst}\left(\int (a+x)\right.}{}$$

$$= \frac{b\sec^5(c+dx)(a+b\tan(c+dx))^2}{7d} + \frac{b\sec^5(c+dx)\left(4\left(8a^2-b^2\right)+15\right.}{70d}$$

$$= \frac{a\left(2a^2-b^2\right)\sec^3(c+dx)\tan(c+dx)}{8d} + \frac{b\sec^5(c+dx)(a+b\tan(c+\right.}{7d}$$

$$= \frac{3a\left(2a^2-b^2\right)\sec(c+dx)\tan(c+dx)}{16d} + \frac{a\left(2a^2-b^2\right)\sec^3(c+dx)\tan}{8d}$$

$$= \frac{3a\left(2a^2-b^2\right)\sinh^{-1}(\tan(c+dx))\sec(c+dx)}{16d\sqrt{\sec^2(c+dx)}} + \frac{3a\left(2a^2-b^2\right)\sec(c+}{16d}$$

Mathematica [B] time = 2.19, size = 637, normalized size = 4.01

$$\frac{\sec^7(c+dx)\left(4340a^3\sin(2(c+dx))+2800a^3\sin(4(c+dx))+420a^3\sin(6(c+dx))-4410a^3\cos(3(c+dx))\log\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^5*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (Sec[c + d*x]^7*(10752*a^2*b + 1536*b^3 + 3584*(3*a^2*b - b^3)*Cos[2*(c + d
*x)] - 4410*a^3*Cos[3*(c + d*x)]*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] +
 2205*a*b^2*Cos[3*(c + d*x)]*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - 147
0*a^3*Cos[5*(c + d*x)]*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + 735*a*b^2
*Cos[5*(c + d*x)]*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - 210*a^3*Cos[7*
(c + d*x)]*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + 105*a*b^2*Cos[7*(c +
d*x)]*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - 3675*a*(2*a^2 - b^2)*Cos[c
 + d*x]*(Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - Log[Cos[(c + d*x)/2] +
Sin[(c + d*x)/2]]) + 4410*a^3*Cos[3*(c + d*x)]*Log[Cos[(c + d*x)/2] + Sin[(
c + d*x)/2]] - 2205*a*b^2*Cos[3*(c + d*x)]*Log[Cos[(c + d*x)/2] + Sin[(c +
d*x)/2]] + 1470*a^3*Cos[5*(c + d*x)]*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2
]] - 735*a*b^2*Cos[5*(c + d*x)]*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] +
210*a^3*Cos[7*(c + d*x)]*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] - 105*a*b
^2*Cos[7*(c + d*x)]*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] + 4340*a^3*Sin
```

```
[2*(c + d*x)] + 6790*a*b^2*Sin[2*(c + d*x)] + 2800*a^3*Sin[4*(c + d*x)] - 1
400*a*b^2*Sin[4*(c + d*x)] + 420*a^3*Sin[6*(c + d*x)] - 210*a*b^2*Sin[6*(c
+ d*x)]))/(35840*d)
```

fricas [A] time = 0.84, size = 170, normalized size = 1.07

$$\frac{105\left(2\,a^{3}-ab^{2}\right)\cos\left(dx+c\right)^{7}\log\left(\sin\left(dx+c\right)+1\right)-105\left(2\,a^{3}-ab^{2}\right)\cos\left(dx+c\right)^{7}\log\left(-\sin\left(dx+c\right)+1\right)+160}{1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/1120*(105*(2*a^3 - a*b^2)*cos(d*x + c)^7*log(sin(d*x + c) + 1) - 105*(2*a
^3 - a*b^2)*cos(d*x + c)^7*log(-sin(d*x + c) + 1) + 160*b^3 + 224*(3*a^2*b
- b^3)*cos(d*x + c)^2 + 70*(3*(2*a^3 - a*b^2)*cos(d*x + c)^5 + 8*a*b^2*cos(
d*x + c) + 2*(2*a^3 - a*b^2)*cos(d*x + c)^3)*sin(d*x + c))/(d*cos(d*x + c)^
7)
```

giac [B] time = 1.08, size = 465, normalized size = 2.92

$$105\left(2\,a^{3}-ab^{2}\right)\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)-105\left(2\,a^{3}-ab^{2}\right)\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)+\frac{2\left(350\,a^{3}\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^{13}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/560*(105*(2*a^3 - a*b^2)*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 105*(2*a^3
- a*b^2)*log(abs(tan(1/2*d*x + 1/2*c) - 1)) + 2*(350*a^3*tan(1/2*d*x + 1/2*
c)^13 + 105*a*b^2*tan(1/2*d*x + 1/2*c)^13 - 1680*a^2*b*tan(1/2*d*x + 1/2*c)
^12 - 840*a^3*tan(1/2*d*x + 1/2*c)^11 + 1540*a*b^2*tan(1/2*d*x + 1/2*c)^11
+ 3360*a^2*b*tan(1/2*d*x + 1/2*c)^10 - 1120*b^3*tan(1/2*d*x + 1/2*c)^10 + 6
30*a^3*tan(1/2*d*x + 1/2*c)^9 + 1085*a*b^2*tan(1/2*d*x + 1/2*c)^9 - 5040*a^
2*b*tan(1/2*d*x + 1/2*c)^8 - 1120*b^3*tan(1/2*d*x + 1/2*c)^8 + 6720*a^2*b*t
an(1/2*d*x + 1/2*c)^6 - 2240*b^3*tan(1/2*d*x + 1/2*c)^6 - 630*a^3*tan(1/2*d
*x + 1/2*c)^5 - 1085*a*b^2*tan(1/2*d*x + 1/2*c)^5 - 3696*a^2*b*tan(1/2*d*x
+ 1/2*c)^4 - 448*b^3*tan(1/2*d*x + 1/2*c)^4 + 840*a^3*tan(1/2*d*x + 1/2*c)^
3 - 1540*a*b^2*tan(1/2*d*x + 1/2*c)^3 + 672*a^2*b*tan(1/2*d*x + 1/2*c)^2 -
224*b^3*tan(1/2*d*x + 1/2*c)^2 - 350*a^3*tan(1/2*d*x + 1/2*c) - 105*a*b^2*t
an(1/2*d*x + 1/2*c) - 336*a^2*b + 32*b^3)/(tan(1/2*d*x + 1/2*c)^2 - 1)^7)/d
```

maple [B] time = 0.54, size = 328, normalized size = 2.06

$$\frac{a^{3}\left(\sec^{3}\left(dx+c\right)\right)\tan\left(dx+c\right)}{4d}+\frac{3a^{3}\sec\left(dx+c\right)\tan\left(dx+c\right)}{8d}+\frac{3a^{3}\ln\left(\sec\left(dx+c\right)+\tan\left(dx+c\right)\right)}{8d}+\frac{3a^{2}b}{5d\cos\left(dx+c\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^5*(a+b*tan(d*x+c))^3,x)
```

```
[Out] 1/4*a^3*sec(d*x+c)^3*tan(d*x+c)/d+3/8*a^3*sec(d*x+c)*tan(d*x+c)/d+3/8/d*a^3
*ln(sec(d*x+c)+tan(d*x+c))+3/5/d*a^2*b/cos(d*x+c)^5+1/2/d*b^2*a*sin(d*x+c)^
3/cos(d*x+c)^6+3/8/d*b^2*a*sin(d*x+c)^3/cos(d*x+c)^4+3/16/d*b^2*a*sin(d*x+c
)^3/cos(d*x+c)^2+3/16*a*b^2*sin(d*x+c)/d-3/16/d*b^2*a*ln(sec(d*x+c)+tan(d*x
+c))+1/7/d*b^3*sin(d*x+c)^4/cos(d*x+c)^7+3/35/d*b^3*sin(d*x+c)^4/cos(d*x+c)
^5+1/35/d*b^3*sin(d*x+c)^4/cos(d*x+c)^3-1/35/d*b^3*sin(d*x+c)^4/cos(d*x+c)-
1/35/d*b^3*cos(d*x+c)*sin(d*x+c)^2-2/35/d*b^3*cos(d*x+c)
```

maxima [A] time = 0.39, size = 208, normalized size = 1.31

$$\frac{35\,ab^2\left(\frac{2\left(3\,\sin(dx+c)^5-8\,\sin(dx+c)^3-3\,\sin(dx+c)\right)}{\sin(dx+c)^6-3\,\sin(dx+c)^4+3\,\sin(dx+c)^2-1}-3\,\log\left(\sin\left(dx+c\right)+1\right)+3\,\log\left(\sin\left(dx+c\right)-1\right)\right)-70\,a^3\left(\frac{2\left(3\,\sin(\cdots\right.}{\sin(dx+\cdots}\right.}{1120\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5*(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/1120*(35*a*b^2*(2*(3*sin(d*x + c)^5 - 8*sin(d*x + c)^3 - 3*sin(d*x + c))/
(sin(d*x + c)^6 - 3*sin(d*x + c)^4 + 3*sin(d*x + c)^2 - 1) - 3*log(sin(d*x
+ c) + 1) + 3*log(sin(d*x + c) - 1)) - 70*a^3*(2*(3*sin(d*x + c)^3 - 5*sin(
d*x + c))/(sin(d*x + c)^4 - 2*sin(d*x + c)^2 + 1) - 3*log(sin(d*x + c) + 1)
 + 3*log(sin(d*x + c) - 1)) + 672*a^2*b/cos(d*x + c)^5 - 32*(7*cos(d*x + c)
^2 - 5)*b^3/cos(d*x + c)^7)/d
```

mupad [B] time = 7.34, size = 423, normalized size = 2.66

$$\frac{3\,a\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)\,\left(2\,a^2-b^2\right)}{8\,d}-\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(\frac{5\,a^3}{4}+\frac{3\,a\,b^2}{8}\right)+\frac{6\,a^2\,b}{5}+\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3\,\left(\frac{11\,a\,b^2}{2}-3\,a^3\right)-\tan\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))^3/cos(c + d*x)^5,x)
```

```
[Out] (3*a*atanh(tan(c/2 + (d*x)/2))*(2*a^2 - b^2))/(8*d) - (tan(c/2 + (d*x)/2)*(
(3*a*b^2)/8 + (5*a^3)/4) + (6*a^2*b)/5 + tan(c/2 + (d*x)/2)^3*((11*a*b^2)/2
 - 3*a^3) - tan(c/2 + (d*x)/2)^11*((11*a*b^2)/2 - 3*a^3) - tan(c/2 + (d*x)/
2)^13*((3*a*b^2)/8 + (5*a^3)/4) + tan(c/2 + (d*x)/2)^5*((31*a*b^2)/8 + (9*a
^3)/4) - tan(c/2 + (d*x)/2)^9*((31*a*b^2)/8 + (9*a^3)/4) - tan(c/2 + (d*x)/
2)^10*(12*a^2*b - 4*b^3) - tan(c/2 + (d*x)/2)^2*((12*a^2*b)/5 - (4*b^3)/5)
+ tan(c/2 + (d*x)/2)^8*(18*a^2*b + 4*b^3) - tan(c/2 + (d*x)/2)^6*(24*a^2*b
- 8*b^3) + tan(c/2 + (d*x)/2)^4*((66*a^2*b)/5 + (8*b^3)/5) - (4*b^3)/35 + 6
*a^2*b*tan(c/2 + (d*x)/2)^12)/(d*(7*tan(c/2 + (d*x)/2)^2 - 21*tan(c/2 + (d*
x)/2)^4 + 35*tan(c/2 + (d*x)/2)^6 - 35*tan(c/2 + (d*x)/2)^8 + 21*tan(c/2 +
(d*x)/2)^10 - 7*tan(c/2 + (d*x)/2)^12 + tan(c/2 + (d*x)/2)^14 - 1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(a+b\tan\left(c+dx\right)\right)^3\sec^5\left(c+dx\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**5*(a+b*tan(d*x+c))**3,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**3*sec(c + d*x)**5, x)
```

3.538 $\int \sec^3(c+dx)(a+b\tan(c+dx))^3\,dx$

Optimal. Leaf size=126

$$\frac{a(4a^2-3b^2)\tanh^{-1}(\sin(c+dx))}{8d}+\frac{b\sec^3(c+dx)\left(8(6a^2-b^2)+21ab\tan(c+dx)\right)}{60d}+\frac{a(4a^2-3b^2)\tan(c+dx)\,\mathrm{se}}{8d}$$

```
[Out] 1/8*a*(4*a^2-3*b^2)*arctanh(sin(d*x+c))/d+1/8*a*(4*a^2-3*b^2)*sec(d*x+c)*ta
n(d*x+c)/d+1/5*b*sec(d*x+c)^3*(a+b*tan(d*x+c))^2/d+1/60*b*sec(d*x+c)^3*(48*
a^2-8*b^2+21*a*b*tan(d*x+c))/d
```

Rubi [A] time = 0.13, antiderivative size = 144, normalized size of antiderivative = 1.14, number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {3512, 743, 780, 195, 215}

$$\frac{b\sec^3(c+dx)\left(8(6a^2-b^2)+21ab\tan(c+dx)\right)}{60d}+\frac{a(4a^2-3b^2)\tan(c+dx)\sec(c+dx)}{8d}+\frac{a(4a^2-3b^2)\sec(c+dx}{8d\sqrt{\sec^2(c}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (a*(4*a^2 - 3*b^2)*ArcSinh[Tan[c + d*x]]*Sec[c + d*x])/(8*d*Sqrt[Sec[c + d*
x]^2]) + (a*(4*a^2 - 3*b^2)*Sec[c + d*x]*Tan[c + d*x])/(8*d) + (b*Sec[c + d
*x]^3*(a + b*Tan[c + d*x])^2)/(5*d) + (b*Sec[c + d*x]^3*(8*(6*a^2 - b^2) +
21*a*b*Tan[c + d*x]))/(60*d)
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 743

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m - 1)*(a + c*x^2)^(p + 1))/(c*(m + 2*p + 1)), x] + Dist[1/(c
*(m + 2*p + 1)), Int[(d + e*x)^(m - 2)*Simp[c*d^2*(m + 2*p + 1) - a*e^2*(m
- 1) + 2*c*d*e*(m + p)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m,
 p}, x] && NeQ[c*d^2 + a*e^2, 0] && If[RationalQ[m], GtQ[m, 1], SumSimplerQ
[m, -2]] && NeQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 780

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[(((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*(a + c*x^2)^(p
+ 1))/(2*c*(p + 1)*(2*p + 3)), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
```

```
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \sec^3(c+dx)(a+b\tan(c+dx))^3\,dx = \frac{\sec(c+dx)\,\text{Subst}\left(\int (a+x)^3\sqrt{1+\frac{x^2}{b^2}}\,dx, x, b\tan(c+dx)\right)}{bd\sqrt{\sec^2(c+dx)}}$$

$$= \frac{b\sec^3(c+dx)(a+b\tan(c+dx))^2}{5d} + \frac{(b\sec(c+dx))\,\text{Subst}\left(\int (a+x)\right.}{5}$$

$$= \frac{b\sec^3(c+dx)(a+b\tan(c+dx))^2}{5d} + \frac{b\sec^3(c+dx)\left(8\left(6a^2-b^2\right)+21\right.}{60d}$$

$$= \frac{a\left(4a^2-3b^2\right)\sec(c+dx)\tan(c+dx)}{8d} + \frac{b\sec^3(c+dx)(a+b\tan(c+}{5d}$$

$$= \frac{a\left(4a^2-3b^2\right)\sinh^{-1}(\tan(c+dx))\sec(c+dx)}{8d\sqrt{\sec^2(c+dx)}} + \frac{a\left(4a^2-3b^2\right)\sec(c+}{8d}$$

Mathematica [B] time = 1.30, size = 464, normalized size = 3.68

$$\frac{\sec^5(c+dx)\left(240a^3\sin(2(c+dx))+120a^3\sin(4(c+dx))-300a^3\cos(3(c+dx))\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^3*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (Sec[c + d*x]^5*(960*a^2*b + 64*b^3 + 320*(3*a^2*b - b^3)*Cos[2*(c + d*x)]
- 300*a^3*Cos[3*(c + d*x)]*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + 225*a
*b^2*Cos[3*(c + d*x)]*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - 60*a^3*Cos
[5*(c + d*x)]*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + 45*a*b^2*Cos[5*(c
+ d*x)]*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - 150*a*(4*a^2 - 3*b^2)*Co
s[c + d*x]*(Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - Log[Cos[(c + d*x)/2]
 + Sin[(c + d*x)/2]]) + 300*a^3*Cos[3*(c + d*x)]*Log[Cos[(c + d*x)/2] + Sin
[(c + d*x)/2]] - 225*a*b^2*Cos[3*(c + d*x)]*Log[Cos[(c + d*x)/2] + Sin[(c +
 d*x)/2]] + 60*a^3*Cos[5*(c + d*x)]*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]
] - 45*a*b^2*Cos[5*(c + d*x)]*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] + 24
0*a^3*Sin[2*(c + d*x)] + 540*a*b^2*Sin[2*(c + d*x)] + 120*a^3*Sin[4*(c + d*
x)] - 90*a*b^2*Sin[4*(c + d*x)]))/(1920*d)
```

fricas [A] time = 0.70, size = 147, normalized size = 1.17

$$\frac{15\left(4a^3-3ab^2\right)\cos(dx+c)^5\log(\sin(dx+c)+1)-15\left(4a^3-3ab^2\right)\cos(dx+c)^5\log(-\sin(dx+c)+1)+}{240\,d\cos(dx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/240*(15*(4*a^3 - 3*a*b^2)*cos(d*x + c)^5*log(sin(d*x + c) + 1) - 15*(4*a^
3 - 3*a*b^2)*cos(d*x + c)^5*log(-sin(d*x + c) + 1) + 48*b^3 + 80*(3*a^2*b -
 b^3)*cos(d*x + c)^2 + 30*(6*a*b^2*cos(d*x + c) + (4*a^3 - 3*a*b^2)*cos(d*x
 + c)^3)*sin(d*x + c))/(d*cos(d*x + c)^5)
```

giac [B] time = 2.61, size = 333, normalized size = 2.64

$$15\left(4a^3-3ab^2\right)\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right)-15\left(4a^3-3ab^2\right)\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right)+\frac{2\left(60a^3\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^9+\cdots\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/120*(15*(4*a^3 - 3*a*b^2)*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 15*(4*a^3
- 3*a*b^2)*log(abs(tan(1/2*d*x + 1/2*c) - 1)) + 2*(60*a^3*tan(1/2*d*x + 1/2
*c)^9 + 45*a*b^2*tan(1/2*d*x + 1/2*c)^9 - 360*a^2*b*tan(1/2*d*x + 1/2*c)^8
- 120*a^3*tan(1/2*d*x + 1/2*c)^7 + 270*a*b^2*tan(1/2*d*x + 1/2*c)^7 + 720*a
^2*b*tan(1/2*d*x + 1/2*c)^6 - 240*b^3*tan(1/2*d*x + 1/2*c)^6 - 480*a^2*b*ta
n(1/2*d*x + 1/2*c)^4 - 80*b^3*tan(1/2*d*x + 1/2*c)^4 + 120*a^3*tan(1/2*d*x
+ 1/2*c)^3 - 270*a*b^2*tan(1/2*d*x + 1/2*c)^3 + 240*a^2*b*tan(1/2*d*x + 1/2
*c)^2 - 80*b^3*tan(1/2*d*x + 1/2*c)^2 - 60*a^3*tan(1/2*d*x + 1/2*c) - 45*a*
b^2*tan(1/2*d*x + 1/2*c) - 120*a^2*b + 16*b^3)/(tan(1/2*d*x + 1/2*c)^2 - 1)
^5)/d
```

maple [B] time = 0.53, size = 256, normalized size = 2.03

$$\frac{a^3\sec(dx+c)\tan(dx+c)}{2d}+\frac{a^3\ln(\sec(dx+c)+\tan(dx+c))}{2d}+\frac{a^2b}{d\cos(dx+c)^3}+\frac{3b^2a\left(\sin^3(dx+c)\right)}{4d\cos(dx+c)^4}+\frac{3b^2a\left(\sin^3\cdots\right.}{8d\cos(\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3*(a+b*tan(d*x+c))^3,x)
```

```
[Out] 1/2*a^3*sec(d*x+c)*tan(d*x+c)/d+1/2/d*a^3*ln(sec(d*x+c)+tan(d*x+c))+1/d*a^2
*b/cos(d*x+c)^3+3/4/d*b^2*a*sin(d*x+c)^3/cos(d*x+c)^4+3/8/d*b^2*a*sin(d*x+c
)^3/cos(d*x+c)^2+3/8*a*b^2*sin(d*x+c)/d-3/8/d*b^2*a*ln(sec(d*x+c)+tan(d*x+c
))+1/5/d*b^3*sin(d*x+c)^4/cos(d*x+c)^5+1/15/d*b^3*sin(d*x+c)^4/cos(d*x+c)^3
-1/15/d*b^3*sin(d*x+c)^4/cos(d*x+c)-1/15/d*b^3*cos(d*x+c)*sin(d*x+c)^2-2/15
/d*b^3*cos(d*x+c)
```

maxima [A] time = 0.38, size = 157, normalized size = 1.25

$$\frac{45ab^2\left(\frac{2\left(\sin(dx+c)^3+\sin(dx+c)\right)}{\sin(dx+c)^4-2\sin(dx+c)^2+1}-\log(\sin(dx+c)+1)+\log(\sin(dx+c)-1)\right)-60a^3\left(\frac{2\sin(dx+c)}{\sin(dx+c)^2-1}-\log(\sin(dx+\cdots\right.}{240d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/240*(45*a*b^2*(2*(sin(d*x + c)^3 + sin(d*x + c))/(sin(d*x + c)^4 - 2*sin(
d*x + c)^2 + 1) - log(sin(d*x + c) + 1) + log(sin(d*x + c) - 1)) - 60*a^3*(
2*sin(d*x + c)/(sin(d*x + c)^2 - 1) - log(sin(d*x + c) + 1) + log(sin(d*x +
 c) - 1)) + 240*a^2*b/cos(d*x + c)^3 - 16*(5*cos(d*x + c)^2 - 3)*b^3/cos(d*
x + c)^5)/d
```

mupad [B] time = 7.32, size = 293, normalized size = 2.33

$$\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^9\left(a^3+\frac{3ab^2}{4}\right)-2a^2b-\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^3\left(\frac{9ab^2}{2}-2a^3\right)+\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^7\left(\frac{9ab^2}{2}-2a^3\right)+\tan\left(\frac{c}{2}+\frac{dx}{2}\right.}{d\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{10}-5\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))^3/cos(c + d*x)^3,x)
```

```
[Out] (tan(c/2 + (d*x)/2)^9*((3*a*b^2)/4 + a^3) - 2*a^2*b - tan(c/2 + (d*x)/2)^3*
((9*a*b^2)/2 - 2*a^3) + tan(c/2 + (d*x)/2)^7*((9*a*b^2)/2 - 2*a^3) + tan(c/
2 + (d*x)/2)^2*(4*a^2*b - (4*b^3)/3) - tan(c/2 + (d*x)/2)^4*(8*a^2*b + (4*b
^3)/3) + tan(c/2 + (d*x)/2)^6*(12*a^2*b - 4*b^3) + (4*b^3)/15 - tan(c/2 + (
d*x)/2)*((3*a*b^2)/4 + a^3) - 6*a^2*b*tan(c/2 + (d*x)/2)^8)/(d*(5*tan(c/2 +
 (d*x)/2)^2 - 10*tan(c/2 + (d*x)/2)^4 + 10*tan(c/2 + (d*x)/2)^6 - 5*tan(c/2
 + (d*x)/2)^8 + tan(c/2 + (d*x)/2)^10 - 1)) - (atanh(tan(c/2 + (d*x)/2))*((
3*a*b^2)/4 - a^3))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+b\tan(c+dx))^3\sec^3(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3*(a+b*tan(d*x+c))**3,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**3*sec(c + d*x)**3, x)
```

3.539 $\int \sec(c+dx)(a+b\tan(c+dx))^3\,dx$

Optimal. Leaf size=91

$$\frac{a\left(2a^2-3b^2\right)\tanh^{-1}(\sin(c+dx))}{2d}+\frac{b\sec(c+dx)\left(4\left(4a^2-b^2\right)+5ab\tan(c+dx)\right)}{6d}+\frac{b\sec(c+dx)(a+b\tan(c+dx)}{3d}$$

```
[Out] 1/2*a*(2*a^2-3*b^2)*arctanh(sin(d*x+c))/d+1/3*b*sec(d*x+c)*(a+b*tan(d*x+c))
^2/d+1/6*b*sec(d*x+c)*(16*a^2-4*b^2+5*a*b*tan(d*x+c))/d
```

Rubi [A] time = 0.09, antiderivative size = 109, normalized size of antiderivative = 1.20, number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {3512, 743, 780, 215}

$$\frac{b\sec(c+dx)\left(4\left(4a^2-b^2\right)+5ab\tan(c+dx)\right)}{6d}+\frac{a\left(2a^2-3b^2\right)\sec(c+dx)\sinh^{-1}(\tan(c+dx))}{2d\sqrt{\sec^2(c+dx)}}+\frac{b\sec(c+dx)(a+}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (a*(2*a^2 - 3*b^2)*ArcSinh[Tan[c + d*x]]*Sec[c + d*x])/(2*d*Sqrt[Sec[c + d*
x]^2]) + (b*Sec[c + d*x]*(a + b*Tan[c + d*x])^2)/(3*d) + (b*Sec[c + d*x]*(4
*(4*a^2 - b^2) + 5*a*b*Tan[c + d*x]))/(6*d)
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 743

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m - 1)*(a + c*x^2)^(p + 1))/(c*(m + 2*p + 1)), x] + Dist[1/(c
*(m + 2*p + 1)), Int[(d + e*x)^(m - 2)*Simp[c*d^2*(m + 2*p + 1) - a*e^2*(m
- 1) + 2*c*d*e*(m + p)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m,
 p}, x] && NeQ[c*d^2 + a*e^2, 0] && If[RationalQ[m], GtQ[m, 1], SumSimplerQ
[m, -2]] && NeQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 780

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[(((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*(a + c*x^2)^(p
+ 1))/(2*c*(p + 1)*(2*p + 3)), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \sec(c+dx)(a+b\tan(c+dx))^3\,dx = \frac{\sec(c+dx)\,\text{Subst}\left(\int \frac{(a+x)^3}{\sqrt{1+\frac{x^2}{b^2}}}\,dx, x, b\tan(c+dx)\right)}{bd\sqrt{\sec^2(c+dx)}}$$

$$= \frac{b\sec(c+dx)(a+b\tan(c+dx))^2}{3d} + \frac{(b\sec(c+dx))\,\text{Subst}\left(\int \frac{(a+x)\left(-2+\frac{3}{\ldots}\right.}{\sqrt{1+\ldots}}\right.}{3d\sqrt{\sec^2(c-\ldots}}$$

$$= \frac{b\sec(c+dx)(a+b\tan(c+dx))^2}{3d} + \frac{b\sec(c+dx)\left(4\left(4a^2-b^2\right)+5ab\,\text{t}\ldots\right.}{6d}$$

$$= \frac{a\left(2a^2-3b^2\right)\sinh^{-1}(\tan(c+dx))\sec(c+dx)}{2d\sqrt{\sec^2(c+dx)}} + \frac{b\sec(c+dx)(a+b\,\text{ta}\ldots}{3d}$$

Mathematica [B] time = 1.59, size = 293, normalized size = 3.22

$$12a^3\log\left(\sin\left(\frac{1}{2}(c+dx)\right)+\cos\left(\frac{1}{2}(c+dx)\right)\right)-6a\left(2a^2-3b^2\right)\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)+2b\sin\ldots$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (36*a^2*b - 10*b^3 - 6*a*(2*a^2 - 3*b^2)*Log[Cos[(c + d*x)/2] - Sin[(c + d*
x)/2]] + 12*a^3*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]] - 18*a*b^2*Log[Cos
[(c + d*x)/2] + Sin[(c + d*x)/2]] + (9*a*b^2)/(Cos[(c + d*x)/2] - Sin[(c +
d*x)/2])^2 + b^3/(Cos[(c + d*x)/2] - Sin[(c + d*x)/2])^2 + 2*b*(18*a^2 - b^
2 + 2*b^2*Cos[c + d*x] + (18*a^2 - 5*b^2)*Cos[2*(c + d*x)])*Sec[c + d*x]^3*
Sin[(c + d*x)/2]^2 - (9*a*b^2)/(Cos[(c + d*x)/2] + Sin[(c + d*x)/2])^2 + b^
3/(Cos[(c + d*x)/2] + Sin[(c + d*x)/2])^2)/(12*d)
```

fricas [A] time = 0.71, size = 123, normalized size = 1.35

$$\frac{3\left(2a^3-3ab^2\right)\cos(dx+c)^3\log(\sin(dx+c)+1)-3\left(2a^3-3ab^2\right)\cos(dx+c)^3\log(-\sin(dx+c)+1)+18\ldots}{12\,d\cos(dx+c)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/12*(3*(2*a^3 - 3*a*b^2)*cos(d*x + c)^3*log(sin(d*x + c) + 1) - 3*(2*a^3 -
 3*a*b^2)*cos(d*x + c)^3*log(-sin(d*x + c) + 1) + 18*a*b^2*cos(d*x + c)*sin
(d*x + c) + 4*b^3 + 12*(3*a^2*b - b^3)*cos(d*x + c)^2)/(d*cos(d*x + c)^3)
```

giac [B] time = 4.31, size = 171, normalized size = 1.88

$$\frac{3\left(2a^3-3ab^2\right)\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right)-3\left(2a^3-3ab^2\right)\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right)+\frac{2\left(9ab^2\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^5-\ldots\right.}{\ldots}}{6\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/6*(3*(2*a^3 - 3*a*b^2)*log(abs(tan(1/2*d*x + 1/2*c) + 1)) - 3*(2*a^3 - 3*
a*b^2)*log(abs(tan(1/2*d*x + 1/2*c) - 1)) + 2*(9*a*b^2*tan(1/2*d*x + 1/2*c)
^5 - 18*a^2*b*tan(1/2*d*x + 1/2*c)^4 + 36*a^2*b*tan(1/2*d*x + 1/2*c)^2 - 12
*b^3*tan(1/2*d*x + 1/2*c)^2 - 9*a*b^2*tan(1/2*d*x + 1/2*c) - 18*a^2*b + 4*b
^3)/(tan(1/2*d*x + 1/2*c)^2 - 1)^3)/d
```

maple [B] time = 0.30, size = 187, normalized size = 2.05

$$\frac{a^3 \ln(\sec(dx+c)+\tan(dx+c))}{d}+\frac{3a^2b}{d\cos(dx+c)}+\frac{3b^2a\left(\sin^3(dx+c)\right)}{2d\cos(dx+c)^2}+\frac{3a\,b^2\sin(dx+c)}{2d}-\frac{3b^2a\ln(\sec(dx+c)}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)*(a+b*tan(d*x+c))^3,x)
```

```
[Out] 1/d*a^3*ln(sec(d*x+c)+tan(d*x+c))+3/d*a^2*b/cos(d*x+c)+3/2/d*b^2*a*sin(d*x+
c)^3/cos(d*x+c)^2+3/2*a*b^2*sin(d*x+c)/d-3/2/d*b^2*a*ln(sec(d*x+c)+tan(d*x+
c))+1/3/d*b^3*sin(d*x+c)^4/cos(d*x+c)^3-1/3/d*b^3*sin(d*x+c)^4/cos(d*x+c)-1
/3/d*b^3*cos(d*x+c)*sin(d*x+c)^2-2/3/d*b^3*cos(d*x+c)
```

maxima [A] time = 0.37, size = 111, normalized size = 1.22

$$-\frac{9\,ab^2\left(\frac{2\sin(dx+c)}{\sin(dx+c)^2-1}+\log(\sin(dx+c)+1)-\log(\sin(dx+c)-1)\right)-12\,a^3\log(\sec(dx+c)+\tan(dx+c))-\frac{36}{\cos(}}{12\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/12*(9*a*b^2*(2*sin(d*x + c)/(sin(d*x + c)^2 - 1) + log(sin(d*x + c) + 1)
 - log(sin(d*x + c) - 1)) - 12*a^3*log(sec(d*x + c) + tan(d*x + c)) - 36*a^
2*b/cos(d*x + c) + 4*(3*cos(d*x + c)^2 - 1)*b^3/cos(d*x + c)^3)/d
```

mupad [B] time = 5.53, size = 160, normalized size = 1.76

$$-\frac{\operatorname{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)\left(3\,a\,b^2-2\,a^3\right)}{d}-\frac{6\,a^2\,b-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2\left(12\,a^2\,b-4\,b^3\right)-\frac{4\,b^3}{3}+3\,a\,b^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+6\,a^2\,}{d\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6-3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+3\tan\left(\frac{c}{2}\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))^3/cos(c + d*x),x)
```

```
[Out] - (atanh(tan(c/2 + (d*x)/2))*(3*a*b^2 - 2*a^3))/d - (6*a^2*b - tan(c/2 + (d
*x)/2)^2*(12*a^2*b - 4*b^3) - (4*b^3)/3 + 3*a*b^2*tan(c/2 + (d*x)/2) + 6*a^
2*b*tan(c/2 + (d*x)/2)^4 - 3*a*b^2*tan(c/2 + (d*x)/2)^5)/(d*(3*tan(c/2 + (d
*x)/2)^2 - 3*tan(c/2 + (d*x)/2)^4 + tan(c/2 + (d*x)/2)^6 - 1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+b\tan(c+dx))^3\sec(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+b*tan(d*x+c))**3,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**3*sec(c + d*x), x)
```

3.540 $\int \cos(c+dx)(a+b\tan(c+dx))^3\,dx$

Optimal. Leaf size=84

$$-\frac{b\sec(c+dx)\left(2\left(a^2-b^2\right)+ab\tan(c+dx)\right)}{d}+\frac{3ab^2\tanh^{-1}(\sin(c+dx))}{d}-\frac{\cos(c+dx)(b-a\tan(c+dx))(a+b}{d}$$

```
[Out] 3*a*b^2*arctanh(sin(d*x+c))/d-cos(d*x+c)*(b-a*tan(d*x+c))*(a+b*tan(d*x+c))^
2/d-b*sec(d*x+c)*(2*a^2-2*b^2+a*b*tan(d*x+c))/d
```

Rubi [A] time = 0.08, antiderivative size = 102, normalized size of antiderivative = 1.21, number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.210$, Rules used = {3512, 739, 780, 215}

$$-\frac{b\sec(c+dx)\left(2\left(a^2-b^2\right)+ab\tan(c+dx)\right)}{d}+\frac{3ab^2\cos(c+dx)\sqrt{\sec^2(c+dx)}\sinh^{-1}(\tan(c+dx))}{d}-\cos(c+d$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (3*a*b^2*ArcSinh[Tan[c + d*x]]*Cos[c + d*x]*Sqrt[Sec[c + d*x]^2])/d - (Cos[
c + d*x]*(b - a*Tan[c + d*x])*(a + b*Tan[c + d*x])^2)/d - (b*Sec[c + d*x]*(
2*(a^2 - b^2) + a*b*Tan[c + d*x]))/d
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 739

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m - 1)*(a*e - c*d*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)), x] +
 Dist[1/((p + 1)*(-2*a*c)), Int[(d + e*x)^(m - 2)*Simp[a*e^2*(m - 1) - c*d^
2*(2*p + 3) - d*c*e*(m + 2*p + 2)*x, x]*(a + c*x^2)^(p + 1), x], x] /; Free
Q[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && I
ntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 780

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[(((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*(a + c*x^2)^(p
+ 1))/(2*c*(p + 1)*(2*p + 3)), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \cos(c+dx)(a+b\tan(c+dx))^3\,dx = \frac{\left(\cos(c+dx)\sqrt{\sec^2(c+dx)}\right)\text{Subst}\left(\int \frac{(a+x)^3}{\left(1+\frac{x^2}{b^2}\right)^{3/2}}dx, x, b\tan(c+dx)\right)}{bd}$$

$$= -\frac{\cos(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))^2}{d} + \frac{\left(b\cos(c+dx)\sqrt{\text{se}\right.}{}$$

$$= -\frac{\cos(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))^2}{d} - \frac{b\sec(c+dx)\left(2\left(a\right.\right.}{}$$

$$= \frac{3ab^2\sinh^{-1}(\tan(c+dx))\cos(c+dx)\sqrt{\sec^2(c+dx)}}{d} - \frac{\cos(c+dx)(b-a}{}$$

Mathematica [A] time = 1.05, size = 131, normalized size = 1.56

$$\frac{\sec(c+dx)\left(a^3\sin(2(c+dx)) + \left(b^3-3a^2b\right)\cos(2(c+dx)) - 3a^2b - 3ab^2\sin(2(c+dx)) - 6ab^2\cos(c+dx)\left(\log\left(\right.\right.\right.}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (Sec[c + d*x]*(-3*a^2*b + 3*b^3 + (-3*a^2*b + b^3)*Cos[2*(c + d*x)] - 6*a*b
^2*Cos[c + d*x]*(Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - Log[Cos[(c + d*
x)/2] + Sin[(c + d*x)/2]]) + a^3*Sin[2*(c + d*x)] - 3*a*b^2*Sin[2*(c + d*x)
]))/(2*d)
```

fricas [A] time = 0.77, size = 109, normalized size = 1.30

$$\frac{3\,ab^2\cos(dx+c)\log(\sin(dx+c)+1) - 3\,ab^2\cos(dx+c)\log(-\sin(dx+c)+1) + 2\,b^3 - 2\left(3\,a^2b-b^3\right)\cos\left(dx\right.}{2\,d\cos(dx+c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/2*(3*a*b^2*cos(d*x + c)*log(sin(d*x + c) + 1) - 3*a*b^2*cos(d*x + c)*log(
-sin(d*x + c) + 1) + 2*b^3 - 2*(3*a^2*b - b^3)*cos(d*x + c)^2 + 2*(a^3 - 3*
a*b^2)*cos(d*x + c)*sin(d*x + c))/(d*cos(d*x + c))
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: NotImplementedError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] Exception raised: NotImplementedError >> Unable to parse Giac output: Unabl
e to check sign: (4*pi/x/2)>(-4*pi/x/2)Unable to check sign: (4*pi/x/2)>(-4
*pi/x/2)Unable to check sign: (4*pi/x/2)>(-4*pi/x/2)Unable to check sign: (
4*pi/x/2)>(-4*pi/x/2)Unable to check sign: (4*pi/x/2)>(-4*pi/x/2)Unable to
check sign: (4*pi/x/2)>(-4*pi/x/2)Unable to check sign: (4*pi/x/2)>(-4*pi/x
/2)Unable to check sign: (4*pi/x/2)>(-4*pi/x/2)(-8*a^3*tan(c/2)^4*tan(d*x/2
```

)^3+8*a^3*tan(c/2)^4*tan(d*x/2)-8*a^3*tan(c/2)^3*tan(d*x/2)^4+48*a^3*tan(c/
2)^3*tan(d*x/2)^2-8*a^3*tan(c/2)^3+48*a^3*tan(c/2)^2*tan(d*x/2)^3-48*a^3*ta
n(c/2)^2*tan(d*x/2)+8*a^3*tan(c/2)*tan(d*x/2)^4-48*a^3*tan(c/2)*tan(d*x/2)^
2+8*a^3*tan(c/2)-8*a^3*tan(d*x/2)^3+8*a^3*tan(d*x/2)-3*a^2*b*pi*sign(tan(c/
2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)
^4*tan(d*x/2)^4+3*a^2*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/
2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^4+12*a^2*b*pi*sign(tan(c/2)^2*tan(d*
x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)^3*tan(d*x/
2)^3+12*a^2*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x
/2)-tan(d*x/2)^2+1)*tan(c/2)^3*tan(d*x/2)+12*a^2*b*pi*sign(tan(c/2)^2*tan(d
*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(c/2)*tan(d*x/2
)^3+12*a^2*b*pi*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/
2)-tan(d*x/2)^2+1)*tan(c/2)*tan(d*x/2)+3*a^2*b*pi*sign(tan(c/2)^2*tan(d*x/2
)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^2+1)*tan(d*x/2)^4-3*a^2*b*p
i*sign(tan(c/2)^2*tan(d*x/2)^2-tan(c/2)^2-4*tan(c/2)*tan(d*x/2)-tan(d*x/2)^
2+1)+3*a^2*b*pi*tan(c/2)^4*tan(d*x/2)^4-3*a^2*b*pi*tan(c/2)^4-12*a^2*b*pi*t
an(c/2)^3*tan(d*x/2)^3-12*a^2*b*pi*tan(c/2)^3*tan(d*x/2)-12*a^2*b*pi*tan(c/
2)*tan(d*x/2)^3-12*a^2*b*pi*tan(c/2)*tan(d*x/2)-3*a^2*b*pi*tan(d*x/2)^4+3*a
^2*b*pi+6*a^2*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*
tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^4*tan(d*x/2)^4-6*a^2*b*atan((ta
n(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(
d*x/2)-1))*tan(c/2)^4-24*a^2*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2
)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^3*tan(d*x/2)^3-2
4*a^2*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/
2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)^3*tan(d*x/2)-24*a^2*b*atan((tan(c/2)*ta
n(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)
)*tan(c/2)*tan(d*x/2)^3-24*a^2*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x
/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))*tan(c/2)*tan(d*x/2)-6*a
^2*b*atan((tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-
tan(c/2)-tan(d*x/2)-1))*tan(d*x/2)^4+6*a^2*b*atan((tan(c/2)*tan(d*x/2)+tan(
c/2)+tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1))+6*a^2*b*ata
n((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)
+tan(d*x/2)-1))*tan(c/2)^4*tan(d*x/2)^4-6*a^2*b*atan((tan(c/2)*tan(d*x/2)-t
an(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)
^4-24*a^2*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(
d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)^3*tan(d*x/2)^3-24*a^2*b*atan((tan(c
/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x
/2)-1))*tan(c/2)^3*tan(d*x/2)-24*a^2*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-t
an(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)*tan(d*x/
2)^3-24*a^2*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*ta
n(d*x/2)+tan(c/2)+tan(d*x/2)-1))*tan(c/2)*tan(d*x/2)-6*a^2*b*atan((tan(c/2)
*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)
-1))*tan(d*x/2)^4+6*a^2*b*atan((tan(c/2)*tan(d*x/2)-tan(c/2)-tan(d*x/2)-1)/
(tan(c/2)*tan(d*x/2)+tan(c/2)+tan(d*x/2)-1))-12*a^2*b*tan(c/2)^4*tan(d*x/2)
^4+24*a^2*b*tan(c/2)^4*tan(d*x/2)^2-12*a^2*b*tan(c/2)^4+96*a^2*b*tan(c/2)^3
*tan(d*x/2)^3-96*a^2*b*tan(c/2)^3*tan(d*x/2)+24*a^2*b*tan(c/2)^2*tan(d*x/2)
^4-240*a^2*b*tan(c/2)^2*tan(d*x/2)^2+24*a^2*b*tan(c/2)^2-96*a^2*b*tan(c/2)*
tan(d*x/2)^3+96*a^2*b*tan(c/2)*tan(d*x/2)-12*a^2*b*tan(d*x/2)^4+24*a^2*b*ta
n(d*x/2)^2-12*a^2*b-6*a*b^2*ln((2*tan(c/2)^2*tan(d*x/2)^4+4*tan(c/2)^2*tan(
d*x/2)^3+4*tan(c/2)^2*tan(d*x/2)^2+4*tan(c/2)^2*tan(d*x/2)+2*tan(c/2)^2+4*t
an(c/2)*tan(d*x/2)^4-4*tan(c/2)+2*tan(d*x/2)^4-4*tan(d*x/2)^3+4*tan(d*x/2)^
2-4*tan(d*x/2)+2)/(tan(c/2)^2+1))*tan(c/2)^4*tan(d*x/2)^4+6*a*b^2*ln((2*tan
(c/2)^2*tan(d*x/2)^4+4*tan(c/2)^2*tan(d*x/2)^3+4*tan(c/2)^2*tan(d*x/2)^2+4*
tan(c/2)^2*tan(d*x/2)+2*tan(c/2)^2+4*tan(c/2)*tan(d*x/2)^4-4*tan(c/2)+2*tan
(d*x/2)^4-4*tan(d*x/2)^3+4*tan(d*x/2)^2-4*tan(d*x/2)+2)/(tan(c/2)^2+1))*tan
(c/2)^4+24*a*b^2*ln((2*tan(c/2)^2*tan(d*x/2)^4+4*tan(c/2)^2*tan(d*x/2)^3+4*
tan(c/2)^2*tan(d*x/2)^2+4*tan(c/2)^2*tan(d*x/2)+2*tan(c/2)^2+4*tan(c/2)*tan
(d*x/2)^4-4*tan(c/2)+2*tan(d*x/2)^4-4*tan(d*x/2)^3+4*tan(d*x/2)^2-4*tan(d*x
/2)+2)/(tan(c/2)^2+1))*tan(c/2)^3*tan(d*x/2)^3+24*a*b^2*ln((2*tan(c/2)^2*ta

```
n(d*x/2)^4+4*tan(c/2)^2*tan(d*x/2)^3+4*tan(c/2)^2*tan(d*x/2)^2+4*tan(c/2)^2
*tan(d*x/2)+2*tan(c/2)^2+4*tan(c/2)*tan(d*x/2)^4-4*tan(c/2)+2*tan(d*x/2)^4-
4*tan(d*x/2)^3+4*tan(d*x/2)^2-4*tan(d*x/2)+2)/(tan(c/2)^2+1))*tan(c/2)^3*ta
n(d*x/2)+24*a*b^2*ln((2*tan(c/2)^2*tan(d*x/2)^4+4*tan(c/2)^2*tan(d*x/2)^3+4
*tan(c/2)^2*tan(d*x/2)^2+4*tan(c/2)^2*tan(d*x/2)+2*tan(c/2)^2+4*tan(c/2)*ta
n(d*x/2)^4-4*tan(c/2)+2*tan(d*x/2)^4-4*tan(d*x/2)^3+4*tan(d*x/2)^2-4*tan(d*
x/2)+2)/(tan(c/2)^2+1))*tan(c/2)*tan(d*x/2)^3+24*a*b^2*ln((2*tan(c/2)^2*tan
(d*x/2)^4+4*tan(c/2)^2*tan(d*x/2)^3+4*tan(c/2)^2*tan(d*x/2)^2+4*tan(c/2)^2*
tan(d*x/2)+2*tan(c/2)^2+4*tan(c/2)*tan(d*x/2)^4-4*tan(c/2)+2*tan(d*x/2)^4-4
*tan(d*x/2)^3+4*tan(d*x/2)^2-4*tan(d*x/2)+2)/(tan(c/2)^2+1))*tan(c/2)*tan(d
*x/2)+6*a*b^2*ln((2*tan(c/2)^2*tan(d*x/2)^4+4*tan(c/2)^2*tan(d*x/2)^3+4*tan
(c/2)^2*tan(d*x/2)^2+4*tan(c/2)^2*tan(d*x/2)+2*tan(c/2)^2+4*tan(c/2)*tan(d*
x/2)^4-4*tan(c/2)+2*tan(d*x/2)^4-4*tan(d*x/2)^3+4*tan(d*x/2)^2-4*tan(d*x/2)
+2)/(tan(c/2)^2+1))*tan(d*x/2)^4-6*a*b^2*ln((2*tan(c/2)^2*tan(d*x/2)^4+4*ta
n(c/2)^2*tan(d*x/2)^3+4*tan(c/2)^2*tan(d*x/2)^2+4*tan(c/2)^2*tan(d*x/2)+2*t
an(c/2)^2+4*tan(c/2)*tan(d*x/2)^4-4*tan(c/2)+2*tan(d*x/2)^4-4*tan(d*x/2)^3+
4*tan(d*x/2)^2-4*tan(d*x/2)+2)/(tan(c/2)^2+1))+6*a*b^2*ln((2*tan(c/2)^2*tan
(d*x/2)^4-4*tan(c/2)^2*tan(d*x/2)^3+4*tan(c/2)^2*tan(d*x/2)^2-4*tan(c/2)^2*
tan(d*x/2)+2*tan(c/2)^2-4*tan(c/2)*tan(d*x/2)^4+4*tan(c/2)+2*tan(d*x/2)^4+4
*tan(d*x/2)^3+4*tan(d*x/2)^2+4*tan(d*x/2)+2)/(tan(c/2)^2+1))*tan(c/2)^4*tan
(d*x/2)^4-6*a*b^2*ln((2*tan(c/2)^2*tan(d*x/2)^4-4*tan(c/2)^2*tan(d*x/2)^3+4
*tan(c/2)^2*tan(d*x/2)^2-4*tan(c/2)^2*tan(d*x/2)+2*tan(c/2)^2-4*tan(c/2)*ta
n(d*x/2)^4+4*tan(c/2)+2*tan(d*x/2)^4+4*tan(d*x/2)^3+4*tan(d*x/2)^2+4*tan(d*
x/2)+2)/(tan(c/2)^2+1))*tan(c/2)^4-24*a*b^2*ln((2*tan(c/2)^2*tan(d*x/2)^4-4
*tan(c/2)^2*tan(d*x/2)^3+4*tan(c/2)^2*tan(d*x/2)^2-4*tan(c/2)^2*tan(d*x/2)+
2*tan(c/2)^2-4*tan(c/2)*tan(d*x/2)^4+4*tan(c/2)+2*tan(d*x/2)^4+4*tan(d*x/2)
^3+4*tan(d*x/2)^2+4*tan(d*x/2)+2)/(tan(c/2)^2+1))*tan(c/2)^3*tan(d*x/2)^3-2
4*a*b^2*ln((2*tan(c/2)^2*tan(d*x/2)^4-4*tan(c/2)^2*tan(d*x/2)^3+4*tan(c/2)^
2*tan(d*x/2)^2-4*tan(c/2)^2*tan(d*x/2)+2*tan(c/2)^2-4*tan(c/2)*tan(d*x/2)^4
+4*tan(c/2)+2*tan(d*x/2)^4+4*tan(d*x/2)^3+4*tan(d*x/2)^2+4*tan(d*x/2)+2)/(t
an(c/2)^2+1))*tan(c/2)^3*tan(d*x/2)-24*a*b^2*ln((2*tan(c/2)^2*tan(d*x/2)^4-
4*tan(c/2)^2*tan(d*x/2)^3+4*tan(c/2)^2*tan(d*x/2)^2-4*tan(c/2)^2*tan(d*x/2)
+2*tan(c/2)^2-4*tan(c/2)*tan(d*x/2)^4+4*tan(c/2)+2*tan(d*x/2)^4+4*tan(d*x/2
)^3+4*tan(d*x/2)^2+4*tan(d*x/2)+2)/(tan(c/2)^2+1))*tan(c/2)*tan(d*x/2)^3-24
*a*b^2*ln((2*tan(c/2)^2*tan(d*x/2)^4-4*tan(c/2)^2*tan(d*x/2)^3+4*tan(c/2)^2
*tan(d*x/2)^2-4*tan(c/2)^2*tan(d*x/2)+2*tan(c/2)^2-4*tan(c/2)*tan(d*x/2)^4+
4*tan(c/2)+2*tan(d*x/2)^4+4*tan(d*x/2)^3+4*tan(d*x/2)^2+4*tan(d*x/2)+2)/(ta
n(c/2)^2+1))*tan(c/2)*tan(d*x/2)-6*a*b^2*ln((2*tan(c/2)^2*tan(d*x/2)^4-4*ta
n(c/2)^2*tan(d*x/2)^3+4*tan(c/2)^2*tan(d*x/2)^2-4*tan(c/2)^2*tan(d*x/2)+2*t
an(c/2)^2-4*tan(c/2)*tan(d*x/2)^4+4*tan(c/2)+2*tan(d*x/2)^4+4*tan(d*x/2)^3+
4*tan(d*x/2)^2+4*tan(d*x/2)+2)/(tan(c/2)^2+1))*tan(d*x/2)^4+6*a*b^2*ln((2*t
an(c/2)^2*tan(d*x/2)^4-4*tan(c/2)^2*tan(d*x/2)^3+4*tan(c/2)^2*tan(d*x/2)^2-
4*tan(c/2)^2*tan(d*x/2)+2*tan(c/2)^2-4*tan(c/2)*tan(d*x/2)^4+4*tan(c/2)+2*t
an(d*x/2)^4+4*tan(d*x/2)^3+4*tan(d*x/2)^2+4*tan(d*x/2)+2)/(tan(c/2)^2+1))+2
4*a*b^2*tan(c/2)^4*tan(d*x/2)^3-24*a*b^2*tan(c/2)^4*tan(d*x/2)+24*a*b^2*tan
(c/2)^3*tan(d*x/2)^4-144*a*b^2*tan(c/2)^3*tan(d*x/2)^2+24*a*b^2*tan(c/2)^3-
144*a*b^2*tan(c/2)^2*tan(d*x/2)^3+144*a*b^2*tan(c/2)^2*tan(d*x/2)-24*a*b^2*
tan(c/2)*tan(d*x/2)^4+144*a*b^2*tan(c/2)*tan(d*x/2)^2-24*a*b^2*tan(c/2)+24*
a*b^2*tan(d*x/2)^3-24*a*b^2*tan(d*x/2)+8*b^3*tan(c/2)^4*tan(d*x/2)^4+8*b^3*
tan(c/2)^4-32*b^3*tan(c/2)^3*tan(d*x/2)^3+32*b^3*tan(c/2)^3*tan(d*x/2)+96*b
^3*tan(c/2)^2*tan(d*x/2)^2+32*b^3*tan(c/2)*tan(d*x/2)^3-32*b^3*tan(c/2)*tan
(d*x/2)+8*b^3*tan(d*x/2)^4+8*b^3)/(4*d*tan(c/2)^4*tan(d*x/2)^4-4*d*tan(c/2)
^4-16*d*tan(c/2)^3*tan(d*x/2)^3-16*d*tan(c/2)^3*tan(d*x/2)-16*d*tan(c/2)*ta
n(d*x/2)^3-16*d*tan(c/2)*tan(d*x/2)-4*d*tan(d*x/2)^4+4*d)
```

maple [A] time = 0.37, size = 126, normalized size = 1.50

$$\frac{a^3 \sin(dx+c)}{d} - \frac{3a^2 b\cos(dx+c)}{d} - \frac{3a b^2 \sin(dx+c)}{d} + \frac{3b^2 a\ln(\sec(dx+c)+\tan(dx+c))}{d} + \frac{b^3\left(\sin^4(dx+c)\right)}{d\cos(dx+c)} + b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)*(a+b*tan(d*x+c))^3,x)
```

```
[Out] a^3*sin(d*x+c)/d-3/d*a^2*b*cos(d*x+c)-3*a*b^2*sin(d*x+c)/d+3/d*b^2*a*ln(sec
(d*x+c)+tan(d*x+c))+1/d*b^3*sin(d*x+c)^4/cos(d*x+c)+1/d*b^3*cos(d*x+c)*sin(
d*x+c)^2+2/d*b^3*cos(d*x+c)
```

maxima [A] time = 0.36, size = 84, normalized size = 1.00

$$\frac{2\,b^3\left(\frac{1}{\cos(dx+c)}+\cos\left(dx+c\right)\right)+3\,ab^2\left(\log\left(\sin\left(dx+c\right)+1\right)-\log\left(\sin\left(dx+c\right)-1\right)-2\,\sin\left(dx+c\right)\right)-6\,a^2b\,\mathrm{co}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/2*(2*b^3*(1/cos(d*x + c) + cos(d*x + c)) + 3*a*b^2*(log(sin(d*x + c) + 1)
 - log(sin(d*x + c) - 1) - 2*sin(d*x + c)) - 6*a^2*b*cos(d*x + c) + 2*a^3*s
in(d*x + c))/d
```

mupad [B] time = 4.25, size = 116, normalized size = 1.38

$$\frac{6\,a\,b^2\,\mathrm{atanh}\left(\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}{d}-\frac{{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^3\,\left(6\,a\,b^2-2\,a^3\right)-6\,a^2\,b-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(6\,a\,b^2-2\,a^3\right)+4\,b^3+6\,a^2}{d\,\left({\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^4-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)*(a + b*tan(c + d*x))^3,x)
```

```
[Out] (6*a*b^2*atanh(tan(c/2 + (d*x)/2)))/d - (tan(c/2 + (d*x)/2)^3*(6*a*b^2 - 2*
a^3) - 6*a^2*b - tan(c/2 + (d*x)/2)*(6*a*b^2 - 2*a^3) + 4*b^3 + 6*a^2*b*tan
(c/2 + (d*x)/2)^2)/(d*(tan(c/2 + (d*x)/2)^4 - 1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a+b\tan\left(c+dx\right)\right)^3\cos\left(c+dx\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+b*tan(d*x+c))**3,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**3*cos(c + d*x), x)
```

3.541 $\int \cos^3(c+dx)(a+b\tan(c+dx))^3\,dx$

Optimal. Leaf size=70

$$-\frac{2\left(a^2+b^2\right)\cos(c+dx)(b-a\tan(c+dx))}{3d}-\frac{\cos^3(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))^2}{3d}$$

```
[Out] -2/3*(a^2+b^2)*cos(d*x+c)*(b-a*tan(d*x+c))/d-1/3*cos(d*x+c)^3*(b-a*tan(d*x+
c))*(a+b*tan(d*x+c))^2/d
```

Rubi [A] time = 0.07, antiderivative size = 70, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3512, 723, 637}

$$-\frac{2\left(a^2+b^2\right)\cos(c+dx)(b-a\tan(c+dx))}{3d}-\frac{\cos^3(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))^2}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (-2*(a^2 + b^2)*Cos[c + d*x]*(b - a*Tan[c + d*x]))/(3*d) - (Cos[c + d*x]^3*
(b - a*Tan[c + d*x])*(a + b*Tan[c + d*x])^2)/(3*d)
```

Rule 637

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[(-(a
*e) + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 723

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m - 1)*(a*e - c*d*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)), x] +
 Dist[((2*p + 3)*(c*d^2 + a*e^2))/(2*a*c*(p + 1)), Int[(d + e*x)^(m - 2)*(a
 + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0
] && EqQ[m + 2*p + 2, 0] && LtQ[p, -1]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] && !IntegerQ[m/2]
```

Rubi steps

$$\int \cos^3(c+dx)(a+b\tan(c+dx))^3\,dx=\frac{\left(\cos(c+dx)\sqrt{\sec^2(c+dx)}\right)\text{Subst}\left(\int \frac{(a+x)^3}{\left(1+\frac{x^2}{b^2}\right)^{5/2}}\,dx,x,b\tan(c+dx)\right)}{bd}$$

$$=-\frac{\cos^3(c+dx)(b-a\tan(c+dx))(a+b\tan(c+dx))^2}{3d}+\frac{\left(2\left(a^2+b^2\right)\cos\right.}{}$$

$$=-\frac{2\left(a^2+b^2\right)\cos(c+dx)(b-a\tan(c+dx))}{3d}-\frac{\cos^3(c+dx)(b-a\tan(c+}{3d}$$

Mathematica [A] time = 0.38, size = 81, normalized size = 1.16

$$\frac{\left(b^3-3a^2b\right)\cos(3(c+dx))-9b\left(a^2+b^2\right)\cos(c+dx)+2a\sin(c+dx)\left(\left(a^2-3b^2\right)\cos(2(c+dx))+5a^2+3b^2\right)}{12d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (-9*b*(a^2 + b^2)*Cos[c + d*x] + (-3*a^2*b + b^3)*Cos[3*(c + d*x)] + 2*a*(5
*a^2 + 3*b^2 + (a^2 - 3*b^2)*Cos[2*(c + d*x)])*Sin[c + d*x])/(12*d)
```

fricas [A] time = 1.54, size = 77, normalized size = 1.10

$$-\frac{3\,b^3\cos\left(dx+c\right)+\left(3\,a^2b-b^3\right)\cos\left(dx+c\right)^3-\left(2\,a^3+3\,ab^2+\left(a^3-3\,ab^2\right)\cos\left(dx+c\right)^2\right)\sin\left(dx+c\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] -1/3*(3*b^3*cos(d*x + c) + (3*a^2*b - b^3)*cos(d*x + c)^3 - (2*a^3 + 3*a*b^
2 + (a^3 - 3*a*b^2)*cos(d*x + c)^2)*sin(d*x + c))/d
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.49, size = 75, normalized size = 1.07

$$\frac{-\frac{b^3\left(2+\sin^2(dx+c)\right)\cos(dx+c)}{3}+b^2a\left(\sin^3\left(dx+c\right)\right)-a^2b\left(\cos^3\left(dx+c\right)\right)+\frac{a^3\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{3}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3*(a+b*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(-1/3*b^3*(2+sin(d*x+c)^2)*cos(d*x+c)+b^2*a*sin(d*x+c)^3-a^2*b*cos(d*x+
c)^3+1/3*a^3*(2+cos(d*x+c)^2)*sin(d*x+c))
```

maxima [A] time = 0.35, size = 77, normalized size = 1.10

$$-\frac{3\,a^2b\cos\left(dx+c\right)^3-3\,ab^2\sin\left(dx+c\right)^3+\left(\sin\left(dx+c\right)^3-3\,\sin\left(dx+c\right)\right)a^3-\left(\cos\left(dx+c\right)^3-3\,\cos\left(dx+c\right)\right.}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/3*(3*a^2*b*cos(d*x + c)^3 - 3*a*b^2*sin(d*x + c)^3 + (sin(d*x + c)^3 - 3
*sin(d*x + c))*a^3 - (cos(d*x + c)^3 - 3*cos(d*x + c))*b^3)/d
```

mupad [B] time = 3.71, size = 104, normalized size = 1.49

$$\frac{\frac{\sin(c+d\,x)\,a^3\cos(c+d\,x)^2}{3}+\frac{2\,\sin(c+d\,x)\,a^3}{3}-a^2\,b\cos\left(c+d\,x\right)^3-\sin\left(c+d\,x\right)\,a\,b^2\cos\left(c+d\,x\right)^2+\sin\left(c+d\,x\right)\,a\,b^2+\frac{b}{}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3*(a + b*tan(c + d*x))^3,x)
```

```
[Out] ((2*a^3*sin(c + d*x))/3 - b^3*cos(c + d*x) + (b^3*cos(c + d*x)^3)/3 - a^2*b
*cos(c + d*x)^3 + (a^3*cos(c + d*x)^2*sin(c + d*x))/3 + a*b^2*sin(c + d*x)
- a*b^2*cos(c + d*x)^2*sin(c + d*x))/d
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a + b \tan (c + dx))^3 \cos^3 (c + dx) \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3*(a+b*tan(d*x+c))**3,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**3*cos(c + d*x)**3, x)
```

3.542 $\int \cos^5(c+dx)(a+b\tan(c+dx))^3\,dx$

Optimal. Leaf size=105

$$-\frac{2\left(4a^2+b^2\right)\cos(c+dx)(b-a\tan(c+dx))}{15d}-\frac{\cos^3(c+dx)(b-4a\tan(c+dx))(a+b\tan(c+dx))^2}{15d}+\frac{\sin(c+d\ldots}{}$$

```
[Out] -2/15*(4*a^2+b^2)*cos(d*x+c)*(b-a*tan(d*x+c))/d-1/15*cos(d*x+c)^3*(b-4*a*ta
n(d*x+c))*(a+b*tan(d*x+c))^2/d+1/5*cos(d*x+c)^4*sin(d*x+c)*(a+b*tan(d*x+c))
^3/d
```

Rubi [A] time = 0.09, antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {3512, 737, 805, 637}

$$-\frac{2\left(4a^2+b^2\right)\cos(c+dx)(b-a\tan(c+dx))}{15d}-\frac{\cos^3(c+dx)(b-4a\tan(c+dx))(a+b\tan(c+dx))^2}{15d}+\frac{\sin(c+d\ldots}{}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^5*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (-2*(4*a^2 + b^2)*Cos[c + d*x]*(b - a*Tan[c + d*x]))/(15*d) - (Cos[c + d*x]
^3*(b - 4*a*Tan[c + d*x])*(a + b*Tan[c + d*x])^2)/(15*d) + (Cos[c + d*x]^4*
Sin[c + d*x]*(a + b*Tan[c + d*x])^3)/(5*d)
```

Rule 637

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2)^(3/2), x_Symbol] :> Simp[(-(a
*e) + c*d*x)/(a*c*Sqrt[a + c*x^2]), x] /; FreeQ[{a, c, d, e}, x]
```

Rule 737

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[(x*(d + e*x)^m*(a + c*x^2)^(p + 1))/(2*a*(p + 1)), x] + Dist[1/(2*a*(p + 1
)), Int[(d + e*x)^(m - 1)*(d*(2*p + 3) + e*(m + 2*p + 3)*x)*(a + c*x^2)^(p
+ 1), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && LtQ[p, -
1] && GtQ[m, 0] && (LtQ[m, 1] || (ILtQ[m + 2*p + 3, 0] && NeQ[m, 2])) && In
tQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 805

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_), x_Symbol] :> Simp[((d + e*x)^m*(a + c*x^2)^(p + 1)*(a*g - c*f*x))/(2*a*
c*(p + 1)), x] - Dist[(m*(c*d*f + a*e*g))/(2*a*c*(p + 1)), Int[(d + e*x)^(m
 - 1)*(a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*
d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0] && LtQ[p, -1]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \cos^5(c+dx)(a+b\tan(c+dx))^3\,dx = \frac{\left(\cos(c+dx)\sqrt{\sec^2(c+dx)}\right)\operatorname{Subst}\left(\int \frac{(a+x)^3}{\left(1+\frac{x^2}{b^2}\right)^{7/2}}dx, x, b\tan(c+dx)\right)}{bd}$$

$$= \frac{\cos^4(c+dx)\sin(c+dx)(a+b\tan(c+dx))^3}{5d} - \frac{\left(\cos(c+dx)\sqrt{\sec^2(c+d}{}$$

$$= -\frac{\cos^3(c+dx)(b-4a\tan(c+dx))(a+b\tan(c+dx))^2}{15d} + \frac{\cos^4(c+dx)\,\mathrm{si}}{}$$

$$= -\frac{2\left(4a^2+b^2\right)\cos(c+dx)(b-a\tan(c+dx))}{15d} - \frac{\cos^3(c+dx)(b-4a\tan(}{}$$

Mathematica [A] time = 0.71, size = 150, normalized size = 1.43

$$\frac{150a^3\sin(c+dx)+25a^3\sin(3(c+dx))+3a^3\sin(5(c+dx))-5\left(9a^2b+b^3\right)\cos(3(c+dx))-30b\left(3a^2+b^2\right)\cos(}{2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^5*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (-30*b*(3*a^2 + b^2)*Cos[c + d*x] - 5*(9*a^2*b + b^3)*Cos[3*(c + d*x)] - 9*
a^2*b*Cos[5*(c + d*x)] + 3*b^3*Cos[5*(c + d*x)] + 150*a^3*Sin[c + d*x] + 90
*a*b^2*Sin[c + d*x] + 25*a^3*Sin[3*(c + d*x)] - 15*a*b^2*Sin[3*(c + d*x)] +
 3*a^3*Sin[5*(c + d*x)] - 9*a*b^2*Sin[5*(c + d*x)])/(240*d)
```

fricas [A] time = 0.66, size = 102, normalized size = 0.97

$$-\frac{5\,b^3\cos(dx+c)^3+3\left(3\,a^2b-b^3\right)\cos(dx+c)^5-\left(3\left(a^3-3\,ab^2\right)\cos(dx+c)^4+8\,a^3+6\,ab^2+\left(4\,a^3+3\,ab^2\right)\mathrm{co}}{15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] -1/15*(5*b^3*cos(d*x + c)^3 + 3*(3*a^2*b - b^3)*cos(d*x + c)^5 - (3*(a^3 -
3*a*b^2)*cos(d*x + c)^4 + 8*a^3 + 6*a*b^2 + (4*a^3 + 3*a*b^2)*cos(d*x + c)^
2)*sin(d*x + c))/d
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.56, size = 125, normalized size = 1.19

$$\frac{b^3\left(-\frac{\left(\cos^3(dx+c)\right)\left(\sin^2(dx+c)\right)}{5}-\frac{2\left(\cos^3(dx+c)\right)}{15}\right)+3b^2a\left(-\frac{\sin(dx+c)\left(\cos^4(dx+c)\right)}{5}+\frac{\left(2+\cos^2(dx+c)\right)\sin(dx+c)}{15}\right)-\frac{3a^2b\left(\cos^5(dx+c)\right)}{5}+\frac{a}{}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^5*(a+b*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(b^3*(-1/5*cos(d*x+c)^3*sin(d*x+c)^2-2/15*cos(d*x+c)^3)+3*b^2*a*(-1/5*s
in(d*x+c)*cos(d*x+c)^4+1/15*(2+cos(d*x+c)^2)*sin(d*x+c))-3/5*a^2*b*cos(d*x+
c)^5+1/5*a^3*(8/3+cos(d*x+c)^4+4/3*cos(d*x+c)^2)*sin(d*x+c))
```

maxima [A] time = 0.36, size = 107, normalized size = 1.02

$$-\frac{9\,a^2b\cos\left(dx+c\right)^5-\left(3\,\sin\left(dx+c\right)^5-10\,\sin\left(dx+c\right)^3+15\,\sin\left(dx+c\right)\right)a^3+3\left(3\,\sin\left(dx+c\right)^5-5\,\sin\left(dx\right.\right.}{15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^5*(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/15*(9*a^2*b*cos(d*x + c)^5 - (3*sin(d*x + c)^5 - 10*sin(d*x + c)^3 + 15*
sin(d*x + c))*a^3 + 3*(3*sin(d*x + c)^5 - 5*sin(d*x + c)^3)*a*b^2 - (3*cos(
d*x + c)^5 - 5*cos(d*x + c)^3)*b^3)/d
```

mupad [B] time = 3.81, size = 147, normalized size = 1.40

$$\frac{2\left(\frac{3\,\sin(c+d\,x)\,a^3\cos(c+d\,x)^4}{2}+2\,\sin\left(c+d\,x\right)\,a^3\cos\left(c+d\,x\right)^2+4\,\sin\left(c+d\,x\right)\,a^3-\frac{9\,a^2\,b\cos(c+d\,x)^5}{2}-\frac{9\,\sin(c+d\,x)\,a\,b^2\,c}{2}\right.}{15\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^5*(a + b*tan(c + d*x))^3,x)
```

```
[Out] (2*(4*a^3*sin(c + d*x) - (5*b^3*cos(c + d*x)^3)/2 + (3*b^3*cos(c + d*x)^5)/
2 - (9*a^2*b*cos(c + d*x)^5)/2 + 2*a^3*cos(c + d*x)^2*sin(c + d*x) + (3*a^3
*cos(c + d*x)^4*sin(c + d*x))/2 + 3*a*b^2*sin(c + d*x) + (3*a*b^2*cos(c + d
*x)^2*sin(c + d*x))/2 - (9*a*b^2*cos(c + d*x)^4*sin(c + d*x))/2))/(15*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(a+b\tan\left(c+dx\right)\right)^3\cos^5\left(c+dx\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**5*(a+b*tan(d*x+c))**3,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**3*cos(c + d*x)**5, x)
```

3.543 $\int \cos^7(c+dx)(a+b\tan(c+dx))^3\,dx$

Optimal. Leaf size=142

$$\frac{8a\left(2a^2+b^2\right)\sin(c+dx)}{35d}-\frac{2\cos^3(c+dx)\left(b\left(6a^2+b^2\right)-a\left(4a^2-b^2\right)\tan(c+dx)\right)}{35d}-\frac{3\cos^5(c+dx)(b-2a\tan(c+}{35d}$$

```
[Out] 8/35*a*(2*a^2+b^2)*sin(d*x+c)/d-3/35*cos(d*x+c)^5*(b-2*a*tan(d*x+c))*(a+b*t
an(d*x+c))^2/d+1/7*cos(d*x+c)^6*sin(d*x+c)*(a+b*tan(d*x+c))^3/d-2/35*cos(d*
x+c)^3*(b*(6*a^2+b^2)-a*(4*a^2-b^2)*tan(d*x+c))/d
```

Rubi [A] time = 0.15, antiderivative size = 142, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$, Rules used = {3512, 737, 821, 778, 191}

$$\frac{8a\left(2a^2+b^2\right)\sin(c+dx)}{35d}-\frac{2\cos^3(c+dx)\left(b\left(6a^2+b^2\right)-a\left(4a^2-b^2\right)\tan(c+dx)\right)}{35d}-\frac{3\cos^5(c+dx)(b-2a\tan(c+}{35d}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^7*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (8*a*(2*a^2 + b^2)*Sin[c + d*x])/(35*d) - (3*Cos[c + d*x]^5*(b - 2*a*Tan[c
+ d*x])*(a + b*Tan[c + d*x])^2)/(35*d) + (Cos[c + d*x]^6*Sin[c + d*x]*(a +
b*Tan[c + d*x])^3)/(7*d) - (2*Cos[c + d*x]^3*(b*(6*a^2 + b^2) - a*(4*a^2 -
b^2)*Tan[c + d*x]))/(35*d)
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 737

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[(x*(d + e*x)^m*(a + c*x^2)^(p + 1))/(2*a*(p + 1)), x] + Dist[1/(2*a*(p + 1
)), Int[(d + e*x)^(m - 1)*(d*(2*p + 3) + e*(m + 2*p + 3)*x)*(a + c*x^2)^(p
+ 1), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && LtQ[p, -
1] && GtQ[m, 0] && (LtQ[m, 1] || (ILtQ[m + 2*p + 3, 0] && NeQ[m, 2])) && In
tQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 778

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[((a*(e*f + d*g) - (c*d*f - a*e*g)*x)*(a + c*x^2)^(p + 1))/
(2*a*c*(p + 1)), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(2*a*c*(p + 1)), Int[(
a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, f, g}, x] && LtQ[p, -1]
```

Rule 821

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_), x_Symbol] :> Simp[((d + e*x)^m*(a + c*x^2)^(p + 1)*(a*g - c*f*x))/(2*a*
c*(p + 1)), x] - Dist[1/(2*a*c*(p + 1)), Int[(d + e*x)^(m - 1)*(a + c*x^2)^
(p + 1)*Simp[a*e*g*m - c*d*f*(2*p + 3) - c*e*f*(m + 2*p + 3)*x, x], x], x]
/; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && G
tQ[m, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
```

```
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \cos^7(c+dx)(a+b\tan(c+dx))^3\,dx = \frac{\left(\cos(c+dx)\sqrt{\sec^2(c+dx)}\right)\text{Subst}\left(\int \frac{(a+x)^3}{\left(1+\frac{x^2}{b^2}\right)^{9/2}}\,dx, x, b\tan(c+dx)\right)}{bd}$$

$$= \frac{\cos^6(c+dx)\sin(c+dx)(a+b\tan(c+dx))^3}{7d} - \frac{\left(\cos(c+dx)\sqrt{\sec^2(c\right.}{}$$

$$= -\frac{3\cos^5(c+dx)(b-2a\tan(c+dx))(a+b\tan(c+dx))^2}{35d} + \frac{\cos^6(c+d}{}$$

$$= -\frac{3\cos^5(c+dx)(b-2a\tan(c+dx))(a+b\tan(c+dx))^2}{35d} + \frac{\cos^6(c+d}{}$$

$$= \frac{8a\left(2a^2+b^2\right)\sin(c+dx)}{35d} - \frac{3\cos^5(c+dx)(b-2a\tan(c+dx))(a+b}{35d}$$

Mathematica [A] time = 1.07, size = 204, normalized size = 1.44

$$\frac{1225a^3\sin(c+dx)+245a^3\sin(3(c+dx))+49a^3\sin(5(c+dx))+5a^3\sin(7(c+dx))-35\left(9a^2b+b^3\right)\cos(3(c}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^7*(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (-105*b*(5*a^2 + b^2)*Cos[c + d*x] - 35*(9*a^2*b + b^3)*Cos[3*(c + d*x)] -
105*a^2*b*Cos[5*(c + d*x)] + 7*b^3*Cos[5*(c + d*x)] - 15*a^2*b*Cos[7*(c + d
*x)] + 5*b^3*Cos[7*(c + d*x)] + 1225*a^3*Sin[c + d*x] + 525*a*b^2*Sin[c + d
*x] + 245*a^3*Sin[3*(c + d*x)] - 35*a*b^2*Sin[3*(c + d*x)] + 49*a^3*Sin[5*(
c + d*x)] - 63*a*b^2*Sin[5*(c + d*x)] + 5*a^3*Sin[7*(c + d*x)] - 15*a*b^2*S
in[7*(c + d*x)])/(2240*d)
```

fricas [A] time = 0.96, size = 123, normalized size = 0.87

$$-\frac{7\,b^3\cos(dx+c)^5+5\left(3\,a^2b-b^3\right)\cos(dx+c)^7-\left(5\left(a^3-3\,ab^2\right)\cos(dx+c)^6+3\left(2\,a^3+ab^2\right)\cos(dx+c)^4\right.}{35\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] -1/35*(7*b^3*cos(d*x + c)^5 + 5*(3*a^2*b - b^3)*cos(d*x + c)^7 - (5*(a^3 -
3*a*b^2)*cos(d*x + c)^6 + 3*(2*a^3 + a*b^2)*cos(d*x + c)^4 + 16*a^3 + 8*a*b
^2 + 4*(2*a^3 + a*b^2)*cos(d*x + c)^2)*sin(d*x + c))/d
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.57, size = 145, normalized size = 1.02

$$\frac{b^3\left(-\frac{\left(\sin^2(dx+c)\right)\left(\cos^5(dx+c)\right)}{7}-\frac{2\left(\cos^5(dx+c)\right)}{35}\right)+3b^2a\left(-\frac{\sin(dx+c)\left(\cos^6(dx+c)\right)}{7}+\frac{\left(\frac{8}{3}+\cos^4(dx+c)+\frac{4\left(\cos^2(dx+c)\right)}{3}\right)\sin(dx+c)}{35}\right)-\frac{3a^2b(\cos}{}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^7*(a+b*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(b^3*(-1/7*sin(d*x+c)^2*cos(d*x+c)^5-2/35*cos(d*x+c)^5)+3*b^2*a*(-1/7*s
in(d*x+c)*cos(d*x+c)^6+1/35*(8/3+cos(d*x+c)^4+4/3*cos(d*x+c)^2)*sin(d*x+c))
-3/7*a^2*b*cos(d*x+c)^7+1/7*a^3*(16/5+cos(d*x+c)^6+6/5*cos(d*x+c)^4+8/5*cos
(d*x+c)^2)*sin(d*x+c))
```

maxima [A] time = 0.36, size = 126, normalized size = 0.89

$$-\frac{15\,a^2b\cos\left(dx+c\right)^7+\left(5\,\sin\left(dx+c\right)^7-21\,\sin\left(dx+c\right)^5+35\,\sin\left(dx+c\right)^3-35\,\sin\left(dx+c\right)\right)a^3-\left(15\,\sin\left(dx+\right.\right.}{35\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^7*(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/35*(15*a^2*b*cos(d*x + c)^7 + (5*sin(d*x + c)^7 - 21*sin(d*x + c)^5 + 35
*sin(d*x + c)^3 - 35*sin(d*x + c))*a^3 - (15*sin(d*x + c)^7 - 42*sin(d*x +
c)^5 + 35*sin(d*x + c)^3)*a*b^2 - (5*cos(d*x + c)^7 - 7*cos(d*x + c)^5)*b^3
)/d
```

mupad [B] time = 3.94, size = 214, normalized size = 1.51

$$\frac{16\,a^3\,\sin\left(c+d\,x\right)}{35\,d}-\frac{b^3\cos\left(c+d\,x\right)^5}{5\,d}+\frac{b^3\cos\left(c+d\,x\right)^7}{7\,d}-\frac{3\,a^2\,b\cos\left(c+d\,x\right)^7}{7\,d}+\frac{8\,a^3\cos\left(c+d\,x\right)^2\,\sin\left(c+d\,x\right)}{35\,d}+\frac{6\,a}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^7*(a + b*tan(c + d*x))^3,x)
```

```
[Out] (16*a^3*sin(c + d*x))/(35*d) - (b^3*cos(c + d*x)^5)/(5*d) + (b^3*cos(c + d*
x)^7)/(7*d) - (3*a^2*b*cos(c + d*x)^7)/(7*d) + (8*a^3*cos(c + d*x)^2*sin(c
+ d*x))/(35*d) + (6*a^3*cos(c + d*x)^4*sin(c + d*x))/(35*d) + (a^3*cos(c +
d*x)^6*sin(c + d*x))/(7*d) + (8*a*b^2*sin(c + d*x))/(35*d) + (4*a*b^2*cos(c
 + d*x)^2*sin(c + d*x))/(35*d) + (3*a*b^2*cos(c + d*x)^4*sin(c + d*x))/(35*
d) - (3*a*b^2*cos(c + d*x)^6*sin(c + d*x))/(7*d)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**7*(a+b*tan(d*x+c))**3,x)
```

```
[Out] Timed out
```

3.544 $\int \frac{\sec^6(c+dx)}{a+b\tan(c+dx)}\,dx$

Optimal. Leaf size=116

$$\frac{(a^2+b^2)^2\log(a+b\tan(c+dx))}{b^5d}-\frac{a(a^2+2b^2)\tan(c+dx)}{b^4d}+\frac{(a^2+2b^2)\tan^2(c+dx)}{2b^3d}-\frac{a\tan^3(c+dx)}{3b^2d}+\frac{\tan^4(c+dx)}{4bd}$$

```
[Out] (a^2+b^2)^2*ln(a+b*tan(d*x+c))/b^5/d-a*(a^2+2*b^2)*tan(d*x+c)/b^4/d+1/2*(a^
2+2*b^2)*tan(d*x+c)^2/b^3/d-1/3*a*tan(d*x+c)^3/b^2/d+1/4*tan(d*x+c)^4/b/d
```

Rubi [A] time = 0.10, antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {3506, 697}

$$\frac{(a^2+2b^2)\tan^2(c+dx)}{2b^3d}-\frac{a(a^2+2b^2)\tan(c+dx)}{b^4d}+\frac{(a^2+b^2)^2\log(a+b\tan(c+dx))}{b^5d}-\frac{a\tan^3(c+dx)}{3b^2d}+\frac{\tan^4(c+dx)}{4bd}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6/(a + b*Tan[c + d*x]),x]
```

```
[Out] ((a^2 + b^2)^2*Log[a + b*Tan[c + d*x]])/(b^5*d) - (a*(a^2 + 2*b^2)*Tan[c +
d*x])/(b^4*d) + ((a^2 + 2*b^2)*Tan[c + d*x]^2)/(2*b^3*d) - (a*Tan[c + d*x]^
3)/(3*b^2*d) + Tan[c + d*x]^4/(4*b*d)
```

Rule 697

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m},
 x] && NeQ[c*d^2 + a*e^2, 0] && IGtQ[p, 0]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^6(c+dx)}{a+b\tan(c+dx)}\,dx&=\frac{\text{Subst}\left(\int \frac{\left(1+\frac{x^2}{b^2}\right)^2}{a+x}\,dx,x,b\tan(c+dx)\right)}{bd}\\&=\frac{\text{Subst}\left(\int \left(\frac{a(-a^2-2b^2)}{b^4}+\frac{(a^2+2b^2)x}{b^4}-\frac{ax^2}{b^4}+\frac{x^3}{b^4}+\frac{(a^2+b^2)^2}{b^4(a+x)}\right)dx,x,b\tan(c+dx)\right)}{bd}\\&=\frac{(a^2+b^2)^2\log(a+b\tan(c+dx))}{b^5d}-\frac{a(a^2+2b^2)\tan(c+dx)}{b^4d}+\frac{(a^2+2b^2)\tan^2(c+dx)}{2b^3d}\end{aligned}$$

Mathematica [A] time = 1.18, size = 99, normalized size = 0.85

$$\frac{6b^2(a^2+b^2)\tan^2(c+dx)-12ab(a^2+2b^2)\tan(c+dx)+12(a^2+b^2)^2\log(a+b\tan(c+dx))-4ab^3\tan^3(c+dx)}{12b^5d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6/(a + b*Tan[c + d*x]),x]
```

```
[Out] (12*(a^2 + b^2)^2*Log[a + b*Tan[c + d*x]] + 3*b^4*Sec[c + d*x]^4 - 12*a*b*(
a^2 + 2*b^2)*Tan[c + d*x] + 6*b^2*(a^2 + b^2)*Tan[c + d*x]^2 - 4*a*b^3*Tan[
c + d*x]^3)/(12*b^5*d)
```

fricas [A] time = 0.60, size = 183, normalized size = 1.58

$$\frac{6\left(a^4+2a^2b^2+b^4\right)\cos(dx+c)^4\log\left(2ab\cos(dx+c)\sin(dx+c)+\left(a^2-b^2\right)\cos(dx+c)^2+b^2\right)-6\left(a^4+2a^2b\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+b*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/12*(6*(a^4 + 2*a^2*b^2 + b^4)*cos(d*x + c)^4*log(2*a*b*cos(d*x + c)*sin(d
*x + c) + (a^2 - b^2)*cos(d*x + c)^2 + b^2) - 6*(a^4 + 2*a^2*b^2 + b^4)*cos
(d*x + c)^4*log(cos(d*x + c)^2) + 3*b^4 + 6*(a^2*b^2 + b^4)*cos(d*x + c)^2
- 4*(a*b^3*cos(d*x + c) + (3*a^3*b + 5*a*b^3)*cos(d*x + c)^3)*sin(d*x + c))
/(b^5*d*cos(d*x + c)^4)
```

giac [A] time = 0.83, size = 120, normalized size = 1.03

$$\frac{\frac{3\,b^3\tan(dx+c)^4-4\,ab^2\tan(dx+c)^3+6\,a^2b\tan(dx+c)^2+12\,b^3\tan(dx+c)^2-12\,a^3\tan(dx+c)-24\,ab^2\tan(dx+c)}{b^4}+\frac{12\left(a^4+2\,a^2b^2+b^4\right)\log(|b\tan(dx+c)+a|)}{b^5}}{12\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+b*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/12*((3*b^3*tan(d*x + c)^4 - 4*a*b^2*tan(d*x + c)^3 + 6*a^2*b*tan(d*x + c)
^2 + 12*b^3*tan(d*x + c)^2 - 12*a^3*tan(d*x + c) - 24*a*b^2*tan(d*x + c))/b
^4 + 12*(a^4 + 2*a^2*b^2 + b^4)*log(abs(b*tan(d*x + c) + a))/b^5)/d
```

maple [A] time = 0.46, size = 162, normalized size = 1.40

$$\frac{\tan^4(dx+c)}{4bd}-\frac{a\left(\tan^3(dx+c)\right)}{3b^2d}+\frac{a^2\left(\tan^2(dx+c)\right)}{2d\,b^3}+\frac{\tan^2(dx+c)}{bd}-\frac{a^3\tan(dx+c)}{d\,b^4}-\frac{2a\tan(dx+c)}{b^2d}+\frac{\ln(a+b\,\mathrm{ta}}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6/(a+b*tan(d*x+c)),x)
```

```
[Out] 1/4*tan(d*x+c)^4/b/d-1/3*a*tan(d*x+c)^3/b^2/d+1/2/d/b^3*a^2*tan(d*x+c)^2+ta
n(d*x+c)^2/b/d-1/d/b^4*a^3*tan(d*x+c)-2*a*tan(d*x+c)/b^2/d+1/d/b^5*ln(a+b*t
an(d*x+c))*a^4+2/d/b^3*ln(a+b*tan(d*x+c))*a^2+ln(a+b*tan(d*x+c))/b/d
```

maxima [A] time = 0.34, size = 108, normalized size = 0.93

$$\frac{\frac{3\,b^3\tan(dx+c)^4-4\,ab^2\tan(dx+c)^3+6\left(a^2b+2\,b^3\right)\tan(dx+c)^2-12\left(a^3+2\,ab^2\right)\tan(dx+c)}{b^4}+\frac{12\left(a^4+2\,a^2b^2+b^4\right)\log(b\tan(dx+c)+a)}{b^5}}{12\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+b*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/12*((3*b^3*tan(d*x + c)^4 - 4*a*b^2*tan(d*x + c)^3 + 6*(a^2*b + 2*b^3)*ta
n(d*x + c)^2 - 12*(a^3 + 2*a*b^2)*tan(d*x + c))/b^4 + 12*(a^4 + 2*a^2*b^2 +
 b^4)*log(b*tan(d*x + c) + a)/b^5)/d
```

mupad [B] time = 3.73, size = 119, normalized size = 1.03

$$\frac{\tan(c+d\,x)^4}{4\,b\,d}+\frac{\tan(c+d\,x)^2\,\left(\frac{1}{b}+\frac{a^2}{2\,b^3}\right)}{d}+\frac{\ln(a+b\tan(c+d\,x))\,\left(a^4+2\,a^2\,b^2+b^4\right)}{b^5\,d}-\frac{a\tan(c+d\,x)^3}{3\,b^2\,d}-\frac{a\tan(c}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^6*(a + b*tan(c + d*x))),x)
```

```
[Out] tan(c + d*x)^4/(4*b*d) + (tan(c + d*x)^2*(1/b + a^2/(2*b^3)))/d + (log(a +
b*tan(c + d*x))*(a^4 + b^4 + 2*a^2*b^2))/(b^5*d) - (a*tan(c + d*x)^3)/(3*b^
2*d) - (a*tan(c + d*x)*(2/b + a^2/b^3))/(b*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^6(c+dx)}{a+b\tan(c+dx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6/(a+b*tan(d*x+c)),x)
```

```
[Out] Integral(sec(c + d*x)**6/(a + b*tan(c + d*x)), x)
```

3.545 $\int \frac{\sec^4(c+dx)}{a+b\tan(c+dx)}\,dx$

Optimal. Leaf size=59

$$\frac{(a^2+b^2)\log(a+b\tan(c+dx))}{b^3d}-\frac{a\tan(c+dx)}{b^2d}+\frac{\tan^2(c+dx)}{2bd}$$

```
[Out] (a^2+b^2)*ln(a+b*tan(d*x+c))/b^3/d-a*tan(d*x+c)/b^2/d+1/2*tan(d*x+c)^2/b/d
```

Rubi [A] time = 0.06, antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {3506, 697}

$$\frac{(a^2+b^2)\log(a+b\tan(c+dx))}{b^3d}-\frac{a\tan(c+dx)}{b^2d}+\frac{\tan^2(c+dx)}{2bd}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4/(a + b*Tan[c + d*x]),x]
```

```
[Out] ((a^2 + b^2)*Log[a + b*Tan[c + d*x]])/(b^3*d) - (a*Tan[c + d*x])/(b^2*d) +
Tan[c + d*x]^2/(2*b*d)
```

Rule 697

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m},
 x] && NeQ[c*d^2 + a*e^2, 0] && IGtQ[p, 0]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sec^4(c+dx)}{a+b\tan(c+dx)}\,dx &= \frac{\text{Subst}\left(\int \frac{1+\frac{x^2}{b^2}}{a+x}\,dx, x, b\tan(c+dx)\right)}{bd}\\
&= \frac{\text{Subst}\left(\int \left(-\frac{a}{b^2}+\frac{x}{b^2}+\frac{a^2+b^2}{b^2(a+x)}\right)dx, x, b\tan(c+dx)\right)}{bd}\\
&= \frac{(a^2+b^2)\log(a+b\tan(c+dx))}{b^3d}-\frac{a\tan(c+dx)}{b^2d}+\frac{\tan^2(c+dx)}{2bd}
\end{aligned}$$

Mathematica [A] time = 0.14, size = 52, normalized size = 0.88

$$\frac{(a^2+b^2)\log(a+b\tan(c+dx))-ab\tan(c+dx)+\frac{1}{2}b^2\tan^2(c+dx)}{b^3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4/(a + b*Tan[c + d*x]),x]
```

```
[Out] ((a^2 + b^2)*Log[a + b*Tan[c + d*x]] - a*b*Tan[c + d*x] + (b^2*Tan[c + d*x]
^2)/2)/(b^3*d)
```

fricas [B] time = 0.83, size = 117, normalized size = 1.98

$$\frac{\left(a^{2}+b^{2}\right)\cos\left(dx+c\right)^{2}\log\left(2\,ab\cos\left(dx+c\right)\sin\left(dx+c\right)+\left(a^{2}-b^{2}\right)\cos\left(dx+c\right)^{2}+b^{2}\right)-\left(a^{2}+b^{2}\right)\cos\left(dx+\right.}{2\,b^{3}d\cos\left(dx+c\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+b*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/2*((a^2 + b^2)*cos(d*x + c)^2*log(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2
- b^2)*cos(d*x + c)^2 + b^2) - (a^2 + b^2)*cos(d*x + c)^2*log(cos(d*x + c)^
2) - 2*a*b*cos(d*x + c)*sin(d*x + c) + b^2)/(b^3*d*cos(d*x + c)^2)
```

giac [A] time = 0.77, size = 54, normalized size = 0.92

$$\frac{\frac{b\tan\left(dx+c\right)^{2}-2\,a\tan\left(dx+c\right)}{b^{2}}+\frac{2\,\left(a^{2}+b^{2}\right)\log\left(\left|b\tan\left(dx+c\right)+a\right|\right)}{b^{3}}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+b*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/2*((b*tan(d*x + c)^2 - 2*a*tan(d*x + c))/b^2 + 2*(a^2 + b^2)*log(abs(b*ta
n(d*x + c) + a))/b^3)/d
```

maple [A] time = 0.43, size = 72, normalized size = 1.22

$$\frac{\tan^{2}\left(dx+c\right)}{2bd}-\frac{a\tan\left(dx+c\right)}{b^{2}d}+\frac{\ln\left(a+b\tan\left(dx+c\right)\right)a^{2}}{d\,b^{3}}+\frac{\ln\left(a+b\tan\left(dx+c\right)\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4/(a+b*tan(d*x+c)),x)
```

```
[Out] 1/2*tan(d*x+c)^2/b/d-a*tan(d*x+c)/b^2/d+1/d/b^3*ln(a+b*tan(d*x+c))*a^2+ln(a
+b*tan(d*x+c))/b/d
```

maxima [A] time = 0.33, size = 53, normalized size = 0.90

$$\frac{\frac{b\tan\left(dx+c\right)^{2}-2\,a\tan\left(dx+c\right)}{b^{2}}+\frac{2\,\left(a^{2}+b^{2}\right)\log\left(b\tan\left(dx+c\right)+a\right)}{b^{3}}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+b*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/2*((b*tan(d*x + c)^2 - 2*a*tan(d*x + c))/b^2 + 2*(a^2 + b^2)*log(b*tan(d*
x + c) + a)/b^3)/d
```

mupad [B] time = 3.59, size = 57, normalized size = 0.97

$$\frac{\tan\left(c+d\,x\right)^{2}}{2\,b\,d}+\frac{\ln\left(a+b\tan\left(c+d\,x\right)\right)\,\left(a^{2}+b^{2}\right)}{b^{3}\,d}-\frac{a\tan\left(c+d\,x\right)}{b^{2}\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^4*(a + b*tan(c + d*x))),x)
```

```
[Out] tan(c + d*x)^2/(2*b*d) + (log(a + b*tan(c + d*x))*(a^2 + b^2))/(b^3*d) - (a
*tan(c + d*x))/(b^2*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^4(c+dx)}{a+b\tan(c+dx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4/(a+b*tan(d*x+c)),x)
```

```
[Out] Integral(sec(c + d*x)**4/(a + b*tan(c + d*x)), x)
```

3.546 $\int \frac{\sec^2(c+dx)}{a+b\tan(c+dx)}\,dx$

Optimal. Leaf size=18

$$\frac{\log(a+b\tan(c+dx))}{bd}$$

```
[Out] ln(a+b*tan(d*x+c))/b/d
```

Rubi [A] time = 0.04, antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {3506, 31}

$$\frac{\log(a+b\tan(c+dx))}{bd}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2/(a + b*Tan[c + d*x]),x]
```

```
[Out] Log[a + b*Tan[c + d*x]]/(b*d)
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^2(c+dx)}{a+b\tan(c+dx)}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{a+x}\,dx, x, b\tan(c+dx)\right)}{bd}\\ &= \frac{\log(a+b\tan(c+dx))}{bd}\end{aligned}$$

Mathematica [A] time = 0.02, size = 18, normalized size = 1.00

$$\frac{\log(a+b\tan(c+dx))}{bd}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2/(a + b*Tan[c + d*x]),x]
```

```
[Out] Log[a + b*Tan[c + d*x]]/(b*d)
```

fricas [B] time = 0.54, size = 59, normalized size = 3.28

$$\frac{\log\left(2\,ab\cos\left(dx+c\right)\sin\left(dx+c\right)+\left(a^2-b^2\right)\cos\left(dx+c\right)^2+b^2\right)-\log\left(\cos\left(dx+c\right)^2\right)}{2\,bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+b*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/2*(log(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 + b^2
) - log(cos(d*x + c)^2))/(b*d)
```

giac [A] time = 0.71, size = 19, normalized size = 1.06

$$\frac{\log\left(|b\tan\left(dx+c\right)+a|\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+b*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] log(abs(b*tan(d*x + c) + a))/(b*d)
```

maple [A] time = 0.33, size = 19, normalized size = 1.06

$$\frac{\ln\left(a+b\tan\left(dx+c\right)\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2/(a+b*tan(d*x+c)),x)
```

```
[Out] ln(a+b*tan(d*x+c))/b/d
```

maxima [A] time = 0.34, size = 18, normalized size = 1.00

$$\frac{\log\left(b\tan\left(dx+c\right)+a\right)}{bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+b*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] log(b*tan(d*x + c) + a)/(b*d)
```

mupad [B] time = 3.59, size = 18, normalized size = 1.00

$$\frac{\ln\left(a+b\tan\left(c+d\,x\right)\right)}{b\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^2*(a + b*tan(c + d*x))),x)
```

```
[Out] log(a + b*tan(c + d*x))/(b*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\sec^2\left(c+dx\right)}{a+b\tan\left(c+dx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2/(a+b*tan(d*x+c)),x)
```

```
[Out] Integral(sec(c + d*x)**2/(a + b*tan(c + d*x)), x)
```

3.547 $\int \frac{\cos^2(c+dx)}{a+b\tan(c+dx)}\,dx$

Optimal. Leaf size=93

$$\frac{\cos^2(c+dx)(a\tan(c+dx)+b)}{2d\left(a^2+b^2\right)}+\frac{ax\left(a^2+3b^2\right)}{2\left(a^2+b^2\right)^2}+\frac{b^3\log(a\cos(c+dx)+b\sin(c+dx))}{d\left(a^2+b^2\right)^2}$$

```
[Out] 1/2*a*(a^2+3*b^2)*x/(a^2+b^2)^2+b^3*ln(a*cos(d*x+c)+b*sin(d*x+c))/(a^2+b^2)
^2/d+1/2*cos(d*x+c)^2*(b+a*tan(d*x+c))/(a^2+b^2)/d
```

Rubi [A] time = 0.14, antiderivative size = 93, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {3506, 741, 801, 635, 203, 260}

$$\frac{\cos^2(c+dx)(a\tan(c+dx)+b)}{2d\left(a^2+b^2\right)}+\frac{b^3\log(a\cos(c+dx)+b\sin(c+dx))}{d\left(a^2+b^2\right)^2}+\frac{ax\left(a^2+3b^2\right)}{2\left(a^2+b^2\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2/(a + b*Tan[c + d*x]),x]
```

```
[Out] (a*(a^2 + 3*b^2)*x)/(2*(a^2 + b^2)^2) + (b^3*Log[a*Cos[c + d*x] + b*Sin[c +
 d*x]])/((a^2 + b^2)^2*d) + (Cos[c + d*x]^2*(b + a*Tan[c + d*x]))/(2*(a^2 +
 b^2)*d)
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 741

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(a*e + c*d*x)*(a + c*x^2)^(p + 1))/(2*a*(p + 1)*(c*d^2
+ a*e^2)), x] + Dist[1/(2*a*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*Simp[
c*d^2*(2*p + 3) + a*e^2*(m + 2*p + 3) + c*e*d*(m + 2*p + 4)*x, x]*(a + c*x^
2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] &&
 LtQ[p, -1] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 801

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_) + (c_.)*(x_)^2),
 x_Symbol] :> Int[ExpandIntegrand[((d + e*x)^m*(f + g*x))/(a + c*x^2), x],
x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] && IntegerQ[m]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^2(c+dx)}{a+b\tan(c+dx)}\,dx = \frac{\text{Subst}\left(\int \frac{1}{(a+x)\left(1+\frac{x^2}{b^2}\right)^2}\,dx, x, b\tan(c+dx)\right)}{bd}$$

$$= \frac{\cos^2(c+dx)(b+a\tan(c+dx))}{2\left(a^2+b^2\right)d} - \frac{b\,\text{Subst}\left(\int \frac{-2-\frac{a^2}{b^2}-\frac{ax}{b^2}}{(a+x)\left(1+\frac{x^2}{b^2}\right)}\,dx, x, b\tan(c+dx)\right)}{2\left(a^2+b^2\right)d}$$

$$= \frac{\cos^2(c+dx)(b+a\tan(c+dx))}{2\left(a^2+b^2\right)d} - \frac{b\,\text{Subst}\left(\int \left(-\frac{2b^2}{\left(a^2+b^2\right)(a+x)} + \frac{-a^3-3ab^2+2b^2x}{\left(a^2+b^2\right)\left(b^2+x^2\right)}\right)dx, x, b\tan\right.}{2\left(a^2+b^2\right)d}$$

$$= \frac{b^3\log(a+b\tan(c+dx))}{\left(a^2+b^2\right)^2 d} + \frac{\cos^2(c+dx)(b+a\tan(c+dx))}{2\left(a^2+b^2\right)d} - \frac{b\,\text{Subst}\left(\int \frac{-a^3-3ab^2+2b^2x}{b^2+x^2}\right.}{2\left(a^2+b\right.}$$

$$= \frac{b^3\log(a+b\tan(c+dx))}{\left(a^2+b^2\right)^2 d} + \frac{\cos^2(c+dx)(b+a\tan(c+dx))}{2\left(a^2+b^2\right)d} - \frac{b^3\,\text{Subst}\left(\int \frac{x}{b^2+x^2}\,dx, x,\right.}{\left(a^2+b^2\right)^2}$$

$$= \frac{a\left(a^2+3b^2\right)x}{2\left(a^2+b^2\right)^2} + \frac{b^3\log(\cos(c+dx))}{\left(a^2+b^2\right)^2 d} + \frac{b^3\log(a+b\tan(c+dx))}{\left(a^2+b^2\right)^2 d} + \frac{\cos^2(c+dx)(b+a}{2\left(a^2+b^2\right.}$$

Mathematica [C] time = 0.24, size = 143, normalized size = 1.54

$$\frac{a^3\sin(2(c+dx)) + 2a^3c + 2a^3dx + b\left(a^2+b^2\right)\cos(2(c+dx)) + 2b^3\log\left((a\cos(c+dx)+b\sin(c+dx))^2\right) + ab^2\,\text{s}}{4d\left(a^2+b^2\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2/(a + b*Tan[c + d*x]),x]
```

```
[Out] (2*a^3*c + 6*a*b^2*c + (4*I)*b^3*c + 2*a^3*d*x + 6*a*b^2*d*x + (4*I)*b^3*d*
x - (4*I)*b^3*ArcTan[Tan[c + d*x]] + b*(a^2 + b^2)*Cos[2*(c + d*x)] + 2*b^3
*Log[(a*Cos[c + d*x] + b*Sin[c + d*x])^2] + a^3*Sin[2*(c + d*x)] + a*b^2*Si
n[2*(c + d*x)])/(4*(a^2 + b^2)^2*d)
```

fricas [A] time = 0.46, size = 119, normalized size = 1.28

$$\frac{b^3\log\left(2\,ab\cos(dx+c)\sin(dx+c) + \left(a^2-b^2\right)\cos(dx+c)^2 + b^2\right) + \left(a^3+3\,ab^2\right)dx + \left(a^2b+b^3\right)\cos(dx+c)^2 +}{2\left(a^4+2\,a^2b^2+b^4\right)d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+b*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/2*(b^3*log(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 +
 b^2) + (a^3 + 3*a*b^2)*d*x + (a^2*b + b^3)*cos(d*x + c)^2 + (a^3 + a*b^2)*
cos(d*x + c)*sin(d*x + c))/((a^4 + 2*a^2*b^2 + b^4)*d)
```

giac [B] time = 1.11, size = 182, normalized size = 1.96

$$\frac{\frac{2\,b^4\log(|b\tan(dx+c)+a|)}{a^4b+2\,a^2b^3+b^5}-\frac{b^3\log\left(\tan(dx+c)^2+1\right)}{a^4+2\,a^2b^2+b^4}+\frac{\left(a^3+3\,ab^2\right)(dx+c)}{a^4+2\,a^2b^2+b^4}+\frac{b^3\tan(dx+c)^2+a^3\tan(dx+c)+ab^2\tan(dx+c)+a^2b+2\,b^3}{\left(a^4+2\,a^2b^2+b^4\right)\left(\tan(dx+c)^2+1\right)}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+b*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/2*(2*b^4*log(abs(b*tan(d*x + c) + a))/(a^4*b + 2*a^2*b^3 + b^5) - b^3*log
(tan(d*x + c)^2 + 1)/(a^4 + 2*a^2*b^2 + b^4) + (a^3 + 3*a*b^2)*(d*x + c)/(a
^4 + 2*a^2*b^2 + b^4) + (b^3*tan(d*x + c)^2 + a^3*tan(d*x + c) + a*b^2*tan(
d*x + c) + a^2*b + 2*b^3)/((a^4 + 2*a^2*b^2 + b^4)*(tan(d*x + c)^2 + 1)))/d
```

maple [B] time = 0.56, size = 236, normalized size = 2.54

$$\frac{b^3\ln\left(a+b\tan\left(dx+c\right)\right)}{d\left(a^2+b^2\right)^2}+\frac{\tan\left(dx+c\right)a^3}{2d\left(a^2+b^2\right)^2\left(1+\tan^2\left(dx+c\right)\right)}+\frac{\tan\left(dx+c\right)b^2a}{2d\left(a^2+b^2\right)^2\left(1+\tan^2\left(dx+c\right)\right)}+\frac{}{2d\left(a^2+b^2\right)^2\left(\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2/(a+b*tan(d*x+c)),x)
```

```
[Out] 1/d*b^3/(a^2+b^2)^2*ln(a+b*tan(d*x+c))+1/2/d/(a^2+b^2)^2/(1+tan(d*x+c)^2)*t
an(d*x+c)*a^3+1/2/d/(a^2+b^2)^2/(1+tan(d*x+c)^2)*tan(d*x+c)*b^2*a+1/2/d/(a^
2+b^2)^2/(1+tan(d*x+c)^2)*a^2*b+1/2/d/(a^2+b^2)^2/(1+tan(d*x+c)^2)*b^3-1/2/
d/(a^2+b^2)^2*b^3*ln(1+tan(d*x+c)^2)+3/2/d/(a^2+b^2)^2*arctan(tan(d*x+c))*b
^2*a+1/2/d/(a^2+b^2)^2*arctan(tan(d*x+c))*a^3
```

maxima [A] time = 0.47, size = 141, normalized size = 1.52

$$\frac{\frac{2\,b^3\log(b\tan(dx+c)+a)}{a^4+2\,a^2b^2+b^4}-\frac{b^3\log\left(\tan(dx+c)^2+1\right)}{a^4+2\,a^2b^2+b^4}+\frac{\left(a^3+3\,ab^2\right)(dx+c)}{a^4+2\,a^2b^2+b^4}+\frac{a\tan(dx+c)+b}{\left(a^2+b^2\right)\tan(dx+c)^2+a^2+b^2}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+b*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/2*(2*b^3*log(b*tan(d*x + c) + a)/(a^4 + 2*a^2*b^2 + b^4) - b^3*log(tan(d*
x + c)^2 + 1)/(a^4 + 2*a^2*b^2 + b^4) + (a^3 + 3*a*b^2)*(d*x + c)/(a^4 + 2*
a^2*b^2 + b^4) + (a*tan(d*x + c) + b)/((a^2 + b^2)*tan(d*x + c)^2 + a^2 + b
^2))/d
```

mupad [B] time = 3.90, size = 156, normalized size = 1.68

$$\frac{\cos\left(c+d\,x\right)^2\,\left(\frac{b}{2\,\left(a^2+b^2\right)}+\frac{a\,\tan(c+d\,x)}{2\,\left(a^2+b^2\right)}\right)}{d}-\frac{\ln\left(\tan\left(c+d\,x\right)+1\mathrm{i}\right)\,\left(2\,b+a\,1\mathrm{i}\right)}{4\,d\,\left(-a^2+a\,b\,2\mathrm{i}+b^2\right)}-\frac{\ln\left(\tan\left(c+d\,x\right)-\mathrm{i}\right)\,\left(a+b\,2\mathrm{i}\right)}{4\,d\,\left(-a^2\,1\mathrm{i}+2\,a\,b+b^2\,1\mathrm{i}\right)}+\frac{b^3\,\ln}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2/(a + b*tan(c + d*x)),x)
```

```
[Out] (cos(c + d*x)^2*(b/(2*(a^2 + b^2)) + (a*tan(c + d*x))/(2*(a^2 + b^2))))/d -
 (log(tan(c + d*x) + 1i)*(a*1i + 2*b))/(4*d*(a*b*2i - a^2 + b^2)) - (log(ta
n(c + d*x) - 1i)*(a + b*2i))/(4*d*(2*a*b - a^2*1i + b^2*1i)) + (b^3*log(a +
 b*tan(c + d*x)))/(d*(a^2 + b^2)^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos^2(c+dx)}{a+b\tan(c+dx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2/(a+b*tan(d*x+c)),x)
```

```
[Out] Integral(cos(c + d*x)**2/(a + b*tan(c + d*x)), x)
```

3.548 $\int \frac{\cos^4(c+dx)}{a+b\tan(c+dx)}\,dx$

Optimal. Leaf size=152

$$\frac{\cos^4(c+dx)(a\tan(c+dx)+b)}{4d\left(a^2+b^2\right)}+\frac{b^5\log(a\cos(c+dx)+b\sin(c+dx))}{d\left(a^2+b^2\right)^3}+\frac{\cos^2(c+dx)\left(a\left(3a^2+7b^2\right)\tan(c+dx\right.}{8d\left(a^2+b^2\right)^2}$$

```
[Out] 1/8*a*(3*a^4+10*a^2*b^2+15*b^4)*x/(a^2+b^2)^3+b^5*ln(a*cos(d*x+c)+b*sin(d*x
+c))/(a^2+b^2)^3/d+1/4*cos(d*x+c)^4*(b+a*tan(d*x+c))/(a^2+b^2)/d+1/8*cos(d*
x+c)^2*(4*b^3+a*(3*a^2+7*b^2)*tan(d*x+c))/(a^2+b^2)^2/d
```

Rubi [A] time = 0.20, antiderivative size = 152, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {3506, 741, 823, 801, 635, 203, 260}

$$\frac{\cos^4(c+dx)(a\tan(c+dx)+b)}{4d\left(a^2+b^2\right)}+\frac{\cos^2(c+dx)\left(a\left(3a^2+7b^2\right)\tan(c+dx)+4b^3\right)}{8d\left(a^2+b^2\right)^2}+\frac{b^5\log(a\cos(c+dx)+b\sin}{d\left(a^2+b^2\right)^3}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4/(a + b*Tan[c + d*x]),x]
```

```
[Out] (a*(3*a^4 + 10*a^2*b^2 + 15*b^4)*x)/(8*(a^2 + b^2)^3) + (b^5*Log[a*Cos[c +
d*x] + b*Sin[c + d*x]])/((a^2 + b^2)^3*d) + (Cos[c + d*x]^4*(b + a*Tan[c +
d*x]))/(4*(a^2 + b^2)*d) + (Cos[c + d*x]^2*(4*b^3 + a*(3*a^2 + 7*b^2)*Tan[c
 + d*x]))/(8*(a^2 + b^2)^2*d)
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 741

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(a*e + c*d*x)*(a + c*x^2)^(p + 1))/(2*a*(p + 1)*(c*d^2
+ a*e^2)), x] + Dist[1/(2*a*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*Simp[
c*d^2*(2*p + 3) + a*e^2*(m + 2*p + 3) + c*e*d*(m + 2*p + 4)*x, x]*(a + c*x^
2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] &&
 LtQ[p, -1] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 801

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_) + (c_.)*(x_)^2),
 x_Symbol] :> Int[ExpandIntegrand[((d + e*x)^m*(f + g*x))/(a + c*x^2), x],
```

```
x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] && IntegerQ[m]
```

Rule 823

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_), x_Symbol] :> -Simp[((d + e*x)^(m + 1)*(f*a*c*e - a*g*c*d + c*(c*d*f + a
*e*g)*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)*(c*d^2 + a*e^2)), x] + Dist[1/
(2*a*c*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*(a + c*x^2)^(p + 1)*Simp[f
*(c^2*d^2*(2*p + 3) + a*c*e^2*(m + 2*p + 3)) - a*c*d*e*g*m + c*e*(c*d*f + a
*e*g)*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*
d^2 + a*e^2, 0] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2
*m, 2*p])
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^4(c+dx)}{a+b\tan(c+dx)}\,dx = \frac{\text{Subst}\left(\int \frac{1}{(a+x)\left(1+\frac{x^2}{b^2}\right)^3}\,dx, x, b\tan(c+dx)\right)}{bd}$$

$$= \frac{\cos^4(c+dx)(b+a\tan(c+dx))}{4\left(a^2+b^2\right)d} - \frac{b\,\text{Subst}\left(\int \frac{-4-\frac{3a^2}{b^2}-\frac{3ax}{b^2}}{(a+x)\left(1+\frac{x^2}{b^2}\right)^2}\,dx, x, b\tan(c+dx)\right)}{4\left(a^2+b^2\right)d}$$

$$= \frac{\cos^4(c+dx)(b+a\tan(c+dx))}{4\left(a^2+b^2\right)d} + \frac{\cos^2(c+dx)\left(4b^3+a\left(3a^2+7b^2\right)\tan(c+dx)\right)}{8\left(a^2+b^2\right)^2 d} + \frac{b^5}{\cdots}$$

$$= \frac{\cos^4(c+dx)(b+a\tan(c+dx))}{4\left(a^2+b^2\right)d} + \frac{\cos^2(c+dx)\left(4b^3+a\left(3a^2+7b^2\right)\tan(c+dx)\right)}{8\left(a^2+b^2\right)^2 d} + \frac{b^5}{\cdots}$$

$$= \frac{b^5\log(a+b\tan(c+dx))}{\left(a^2+b^2\right)^3 d} + \frac{\cos^4(c+dx)(b+a\tan(c+dx))}{4\left(a^2+b^2\right)d} + \frac{\cos^2(c+dx)\left(4b^3+a\left(3\cdots\right.\right.}{8\left(a^2+\cdots\right.}$$

$$= \frac{b^5\log(a+b\tan(c+dx))}{\left(a^2+b^2\right)^3 d} + \frac{\cos^4(c+dx)(b+a\tan(c+dx))}{4\left(a^2+b^2\right)d} + \frac{\cos^2(c+dx)\left(4b^3+a\left(3\cdots\right.\right.}{8\left(a^2+\cdots\right.}$$

$$= \frac{a\left(3a^4+10a^2b^2+15b^4\right)x}{8\left(a^2+b^2\right)^3} + \frac{b^5\log(\cos(c+dx))}{\left(a^2+b^2\right)^3 d} + \frac{b^5\log(a+b\tan(c+dx))}{\left(a^2+b^2\right)^3 d} + \frac{\cos^4(c\cdots}{\cdots}$$

Mathematica [A] time = 0.41, size = 218, normalized size = 1.43

$$8a^5\sin(2(c+dx)) + a^5\sin(4(c+dx)) + 12a^5c + 12a^5dx + 24a^3b^2\sin(2(c+dx)) + 2a^3b^2\sin(4(c+dx)) + 40a^3b^2\cdots$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4/(a + b*Tan[c + d*x]),x]
```

```
[Out] (12*a^5*c + 40*a^3*b^2*c + 60*a*b^4*c + 12*a^5*d*x + 40*a^3*b^2*d*x + 60*a*
b^4*d*x + 4*b*(a^4 + 4*a^2*b^2 + 3*b^4)*Cos[2*(c + d*x)] + b*(a^2 + b^2)^2*
Cos[4*(c + d*x)] + 32*b^5*Log[a*Cos[c + d*x] + b*Sin[c + d*x]] + 8*a^5*Sin[
2*(c + d*x)] + 24*a^3*b^2*Sin[2*(c + d*x)] + 16*a*b^4*Sin[2*(c + d*x)] + a^
5*Sin[4*(c + d*x)] + 2*a^3*b^2*Sin[4*(c + d*x)] + a*b^4*Sin[4*(c + d*x)])/(
32*(a^2 + b^2)^3*d)
```

fricas [A] time = 1.00, size = 208, normalized size = 1.37

$$\frac{4\,b^{5}\log\left(2\,ab\cos\left(dx+c\right)\sin\left(dx+c\right)+\left(a^{2}-b^{2}\right)\cos\left(dx+c\right)^{2}+b^{2}\right)+2\left(a^{4}b+2\,a^{2}b^{3}+b^{5}\right)\cos\left(dx+c\right)^{4}+ (\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+b*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/8*(4*b^5*log(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2
 + b^2) + 2*(a^4*b + 2*a^2*b^3 + b^5)*cos(d*x + c)^4 + (3*a^5 + 10*a^3*b^2
+ 15*a*b^4)*d*x + 4*(a^2*b^3 + b^5)*cos(d*x + c)^2 + (2*(a^5 + 2*a^3*b^2 +
a*b^4)*cos(d*x + c)^3 + (3*a^5 + 10*a^3*b^2 + 7*a*b^4)*cos(d*x + c))*sin(d*
x + c))/((a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6)*d)
```

giac [B] time = 1.63, size = 322, normalized size = 2.12

$$\frac{\frac{8\,b^{6}\log\left(\left|b\tan\left(dx+c\right)+a\right|\right)}{a^{6}b+3\,a^{4}b^{3}+3\,a^{2}b^{5}+b^{7}}-\frac{4\,b^{5}\log\left(\tan\left(dx+c\right)^{2}+1\right)}{a^{6}+3\,a^{4}b^{2}+3\,a^{2}b^{4}+b^{6}}+\frac{\left(3\,a^{5}+10\,a^{3}b^{2}+15\,ab^{4}\right)\left(dx+c\right)}{a^{6}+3\,a^{4}b^{2}+3\,a^{2}b^{4}+b^{6}}+\frac{6\,b^{5}\tan\left(dx+c\right)^{4}+3\,a^{5}\tan\left(dx+c\right)^{3}+10\,a^{3}b^{2}\tan\left(dx+c\right)^{3}+7\cdots}{\cdots}}{8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+b*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] 1/8*(8*b^6*log(abs(b*tan(d*x + c) + a))/(a^6*b + 3*a^4*b^3 + 3*a^2*b^5 + b^
7) - 4*b^5*log(tan(d*x + c)^2 + 1)/(a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6) + (3
*a^5 + 10*a^3*b^2 + 15*a*b^4)*(d*x + c)/(a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6)
 + (6*b^5*tan(d*x + c)^4 + 3*a^5*tan(d*x + c)^3 + 10*a^3*b^2*tan(d*x + c)^3
 + 7*a*b^4*tan(d*x + c)^3 + 4*a^2*b^3*tan(d*x + c)^2 + 16*b^5*tan(d*x + c)^
2 + 5*a^5*tan(d*x + c) + 14*a^3*b^2*tan(d*x + c) + 9*a*b^4*tan(d*x + c) + 2
*a^4*b + 8*a^2*b^3 + 12*b^5)/((a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6)*(tan(d*x
+ c)^2 + 1)^2))/d
```

maple [B] time = 0.54, size = 524, normalized size = 3.45

$$\frac{b^{5}\ln\left(a+b\tan\left(dx+c\right)\right)}{d\left(a^{2}+b^{2}\right)^{3}}+\frac{3\left(\tan^{3}\left(dx+c\right)\right)a^{5}}{8d\left(a^{2}+b^{2}\right)^{3}\left(1+\tan^{2}\left(dx+c\right)\right)^{2}}+\frac{5\left(\tan^{3}\left(dx+c\right)\right)b^{2}a^{3}}{4d\left(a^{2}+b^{2}\right)^{3}\left(1+\tan^{2}\left(dx+c\right)\right)^{2}}+\frac{7\left(\tan\cdots\right.}{8d\left(a^{2}+b^{2}\right)^{3}\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4/(a+b*tan(d*x+c)),x)
```

```
[Out] 1/d*b^5/(a^2+b^2)^3*ln(a+b*tan(d*x+c))+3/8/d/(a^2+b^2)^3/(1+tan(d*x+c)^2)^2
*tan(d*x+c)^3*a^5+5/4/d/(a^2+b^2)^3/(1+tan(d*x+c)^2)^2*tan(d*x+c)^3*b^2*a^3
+7/8/d/(a^2+b^2)^3/(1+tan(d*x+c)^2)^2*tan(d*x+c)^3*a*b^4+1/2/d/(a^2+b^2)^3/
(1+tan(d*x+c)^2)^2*tan(d*x+c)^2*a^2*b^3+1/2/d/(a^2+b^2)^3/(1+tan(d*x+c)^2)^
2*tan(d*x+c)^2*b^5+7/4/d/(a^2+b^2)^3/(1+tan(d*x+c)^2)^2*tan(d*x+c)*b^2*a^3+
9/8/d/(a^2+b^2)^3/(1+tan(d*x+c)^2)^2*tan(d*x+c)*a*b^4+5/8/d/(a^2+b^2)^3/(1+
tan(d*x+c)^2)^2*tan(d*x+c)*a^5+1/4/d/(a^2+b^2)^3/(1+tan(d*x+c)^2)^2*a^4*b+1
```

```
/d/(a^2+b^2)^3/(1+tan(d*x+c)^2)^2*a^2*b^3+3/4/d/(a^2+b^2)^3/(1+tan(d*x+c)^2
)^2*b^5-1/2/d/(a^2+b^2)^3*b^5*ln(1+tan(d*x+c)^2)+15/8/d/(a^2+b^2)^3*arctan(
tan(d*x+c))*a*b^4+3/8/d/(a^2+b^2)^3*arctan(tan(d*x+c))*a^5+5/4/d/(a^2+b^2)^
3*arctan(tan(d*x+c))*b^2*a^3
```

maxima [A] time = 0.47, size = 271, normalized size = 1.78

$$\frac{\frac{8\,b^5\log(b\tan(dx+c)+a)}{a^6+3\,a^4b^2+3\,a^2b^4+b^6}-\frac{4\,b^5\log\left(\tan(dx+c)^2+1\right)}{a^6+3\,a^4b^2+3\,a^2b^4+b^6}+\frac{\left(3\,a^5+10\,a^3b^2+15\,ab^4\right)(dx+c)}{a^6+3\,a^4b^2+3\,a^2b^4+b^6}+\frac{4\,b^3\tan(dx+c)^2+\left(3\,a^3+7\,ab^2\right)\tan(dx+c)^3+2\,a^2b+6\,b^3+\left(5\,a^3+\right.}{\left(a^4+2\,a^2b^2+b^4\right)\tan(dx+c)^4+a^4+2\,a^2b^2+b^4+2\left(a^4+2\,a^2b^2+\right.}}{8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+b*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/8*(8*b^5*log(b*tan(d*x + c) + a)/(a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6) - 4*
b^5*log(tan(d*x + c)^2 + 1)/(a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6) + (3*a^5 +
10*a^3*b^2 + 15*a*b^4)*(d*x + c)/(a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6) + (4*b
^3*tan(d*x + c)^2 + (3*a^3 + 7*a*b^2)*tan(d*x + c)^3 + 2*a^2*b + 6*b^3 + (5
*a^3 + 9*a*b^2)*tan(d*x + c))/((a^4 + 2*a^2*b^2 + b^4)*tan(d*x + c)^4 + a^4
 + 2*a^2*b^2 + b^4 + 2*(a^4 + 2*a^2*b^2 + b^4)*tan(d*x + c)^2))/d
```

mupad [B] time = 4.20, size = 318, normalized size = 2.09

$$\frac{\frac{a^2\,b+3\,b^3}{4\left(a^4+2\,a^2\,b^2+b^4\right)}+\frac{b^3\tan(c+d\,x)^2}{2\left(a^4+2\,a^2\,b^2+b^4\right)}+\frac{\tan(c+d\,x)^3\left(3\,a^3+7\,a\,b^2\right)}{8\left(a^4+2\,a^2\,b^2+b^4\right)}+\frac{\tan(c+d\,x)\left(5\,a^3+9\,a\,b^2\right)}{8\left(a^4+2\,a^2\,b^2+b^4\right)}}{d\,\left(\tan\left(c+d\,x\right)^4+2\tan\left(c+d\,x\right)^2+1\right)}-\frac{\ln\left(\tan\left(c+d\,x\right)-\mathrm{i}\right)\left(-a^2\,3\mathrm{i}+9\,a\,b+\right.}{16\,d\,\left(-a^3-a^2\,b\,3\mathrm{i}+3\,a\,b^2+b^3\,1\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4/(a + b*tan(c + d*x)),x)
```

```
[Out] ((a^2*b + 3*b^3)/(4*(a^4 + b^4 + 2*a^2*b^2)) + (b^3*tan(c + d*x)^2)/(2*(a^4
 + b^4 + 2*a^2*b^2)) + (tan(c + d*x)^3*(7*a*b^2 + 3*a^3))/(8*(a^4 + b^4 + 2
*a^2*b^2)) + (tan(c + d*x)*(9*a*b^2 + 5*a^3))/(8*(a^4 + b^4 + 2*a^2*b^2)))/
(d*(2*tan(c + d*x)^2 + tan(c + d*x)^4 + 1)) - (log(tan(c + d*x) - 1i)*(9*a*
b - a^2*3i + b^2*8i))/(16*d*(3*a*b^2 - a^2*b*3i - a^3 + b^3*1i)) + (b^5*log
(a + b*tan(c + d*x)))/(d*(a^2 + b^2)^3) - (log(tan(c + d*x) + 1i)*(a*b*9i -
 3*a^2 + 8*b^2))/(16*d*(a*b^2*3i - 3*a^2*b - a^3*1i + b^3))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos^4(c+dx)}{a+b\tan(c+dx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4/(a+b*tan(d*x+c)),x)
```

```
[Out] Integral(cos(c + d*x)**4/(a + b*tan(c + d*x)), x)
```

3.549 $\int \frac{\sec^5(c+dx)}{a+b\tan(c+dx)}\,dx$

Optimal. Leaf size=140

$$-\frac{a\left(2a^2+3b^2\right)\tanh^{-1}(\sin(c+dx))}{2b^4d}-\frac{\left(a^2+b^2\right)^{3/2}\tanh^{-1}\left(\frac{\cos(c+dx)(b-a\tan(c+dx))}{\sqrt{a^2+b^2}}\right)}{b^4d}+\frac{\left(a^2+b^2\right)\sec(c+dx)}{b^3d}-\frac{a\tan(}{}$$

```
[Out] -1/2*a*(2*a^2+3*b^2)*arctanh(sin(d*x+c))/b^4/d-(a^2+b^2)^(3/2)*arctanh(cos(
d*x+c)*(b-a*tan(d*x+c))/(a^2+b^2)^(1/2))/b^4/d+(a^2+b^2)*sec(d*x+c)/b^3/d+1
/3*sec(d*x+c)^3/b/d-1/2*a*sec(d*x+c)*tan(d*x+c)/b^2/d
```

Rubi [A] time = 0.20, antiderivative size = 152, normalized size of antiderivative = 1.09, number of steps used = 9, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {3510, 3486, 3768, 3770, 3509, 206}

$$\frac{\left(a^2+b^2\right)\sec(c+dx)}{b^3d}-\frac{a\left(a^2+b^2\right)\tanh^{-1}(\sin(c+dx))}{b^4d}-\frac{\left(a^2+b^2\right)^{3/2}\tanh^{-1}\left(\frac{\cos(c+dx)(b-a\tan(c+dx))}{\sqrt{a^2+b^2}}\right)}{b^4d}-\frac{a\tanh^{-1}(s}{2}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^5/(a + b*Tan[c + d*x]),x]
```

```
[Out] -(a*ArcTanh[Sin[c + d*x]])/(2*b^2*d) - (a*(a^2 + b^2)*ArcTanh[Sin[c + d*x]]
)/(b^4*d) - ((a^2 + b^2)^(3/2)*ArcTanh[(Cos[c + d*x]*(b - a*Tan[c + d*x]))/
Sqrt[a^2 + b^2]])/(b^4*d) + ((a^2 + b^2)*Sec[c + d*x])/(b^3*d) + Sec[c + d*
x]^3/(3*b*d) - (a*Sec[c + d*x]*Tan[c + d*x])/(2*b^2*d)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3509

```
Int[sec[(e_.) + (f_.)*(x_)]/((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]), x_Symbo
l] :> -Dist[f^(-1), Subst[Int[1/(a^2 + b^2 - x^2), x], x, (b - a*Tan[e + f*
x])/Sec[e + f*x]], x] /; FreeQ[{a, b, e, f}, x] && NeQ[a^2 + b^2, 0]
```

Rule 3510

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)/((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)]), x_Symbol] :> -Dist[d^2/b^2, Int[(d*Sec[e + f*x])^(m - 2)*(a - b*Tan[e
 + f*x]), x], x] + Dist[(d^2*(a^2 + b^2))/b^2, Int[(d*Sec[e + f*x])^(m - 2)
/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 + b^2
, 0] && IGtQ[m, 1]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
```

```
IntegerQ[2*n]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \frac{\sec^5(c+dx)}{a+b\tan(c+dx)}\,dx = -\frac{\int \sec^3(c+dx)(a-b\tan(c+dx))\,dx}{b^2}+\frac{\left(a^2+b^2\right)\int \frac{\sec^3(c+dx)}{a+b\tan(c+dx)}\,dx}{b^2}$$

$$= \frac{\sec^3(c+dx)}{3bd}-\frac{a\int \sec^3(c+dx)\,dx}{b^2}-\frac{\left(a^2+b^2\right)\int \sec(c+dx)(a-b\tan(c+dx))\,dx}{b^4}+ \ldots$$

$$= \frac{\left(a^2+b^2\right)\sec(c+dx)}{b^3d}+\frac{\sec^3(c+dx)}{3bd}-\frac{a\sec(c+dx)\tan(c+dx)}{2b^2d}-\frac{a\int \sec(c+dx)\,dx}{2b^2} \ldots$$

$$= -\frac{a\tanh^{-1}(\sin(c+dx))}{2b^2d}-\frac{a\left(a^2+b^2\right)\tanh^{-1}(\sin(c+dx))}{b^4d}-\frac{\left(a^2+b^2\right)^{3/2}\tanh^{-1}\left(\frac{\cos(c+\ldots}{\ldots}\right.}{b^4d} \ldots$$

Mathematica [B] time = 2.00, size = 321, normalized size = 2.29

$$\frac{48\left(a^2+b^2\right)^{3/2}\tanh^{-1}\left(\frac{a\tan\left(\frac{1}{2}(c+dx)\right)-b}{\sqrt{a^2+b^2}}\right)+\sec^3(c+dx)\left(6a^3\cos(3(c+dx))\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right) \ldots}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^5/(a + b*Tan[c + d*x]),x]
```

```
[Out] (48*(a^2 + b^2)^(3/2)*ArcTanh[(-b + a*Tan[(c + d*x)/2])/Sqrt[a^2 + b^2]] +
Sec[c + d*x]^3*(12*a^2*b + 20*b^3 + 12*b*(a^2 + b^2)*Cos[2*(c + d*x)] + 6*a
^3*Cos[3*(c + d*x)]*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + 9*a*b^2*Cos[
3*(c + d*x)]*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] + 9*a*(2*a^2 + 3*b^2)
*Cos[c + d*x]*(Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - Log[Cos[(c + d*x)
/2] + Sin[(c + d*x)/2]]) - 6*a^3*Cos[3*(c + d*x)]*Log[Cos[(c + d*x)/2] + Si
n[(c + d*x)/2]] - 9*a*b^2*Cos[3*(c + d*x)]*Log[Cos[(c + d*x)/2] + Sin[(c +
d*x)/2]] - 6*a*b^2*Sin[2*(c + d*x)]))/(24*b^4*d)
```

fricas [A] time = 1.89, size = 259, normalized size = 1.85

$$\frac{6\left(a^2+b^2\right)^{\frac{3}{2}}\cos(dx+c)^3\log\left(-\frac{2ab\cos(dx+c)\sin(dx+c)+\left(a^2-b^2\right)\cos(dx+c)^2-2a^2-b^2+2\sqrt{a^2+b^2}\,(b\cos(dx+c)-a\sin(dx+c))}{2ab\cos(dx+c)\sin(dx+c)+\left(a^2-b^2\right)\cos(dx+c)^2+b^2}\right)-3\left(2a^3 \ldots\right.}{\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+b*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/12*(6*(a^2 + b^2)^(3/2)*cos(d*x + c)^3*log(-(2*a*b*cos(d*x + c)*sin(d*x +
 c) + (a^2 - b^2)*cos(d*x + c)^2 - 2*a^2 - b^2 + 2*sqrt(a^2 + b^2)*(b*cos(d
*x + c) - a*sin(d*x + c)))/(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*c
os(d*x + c)^2 + b^2)) - 3*(2*a^3 + 3*a*b^2)*cos(d*x + c)^3*log(sin(d*x + c)
 + 1) + 3*(2*a^3 + 3*a*b^2)*cos(d*x + c)^3*log(-sin(d*x + c) + 1) - 6*a*b^2
*cos(d*x + c)*sin(d*x + c) + 4*b^3 + 12*(a^2*b + b^3)*cos(d*x + c)^2)/(b^4*
d*cos(d*x + c)^3)
```

giac [B] time = 0.81, size = 278, normalized size = 1.99

$$-\frac{\frac{3\left(2a^3+3ab^2\right)\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right)}{b^4}-\frac{3\left(2a^3+3ab^2\right)\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right)}{b^4}+\frac{6\left(a^4+2a^2b^2+b^4\right)\log\left(\frac{\left|2a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-2b-2\sqrt{a^2+b^2}\right|}{\left|2a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-2b+2\sqrt{a^2+b^2}\right|}\right)}{\sqrt{a^2+b^2}\,b^4}+\cdots}{6\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+b*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/6*(3*(2*a^3 + 3*a*b^2)*log(abs(tan(1/2*d*x + 1/2*c) + 1))/b^4 - 3*(2*a^3
 + 3*a*b^2)*log(abs(tan(1/2*d*x + 1/2*c) - 1))/b^4 + 6*(a^4 + 2*a^2*b^2 + b
^4)*log(abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b - 2*sqrt(a^2 + b^2))/abs(2*a*tan
(1/2*d*x + 1/2*c) - 2*b + 2*sqrt(a^2 + b^2)))/(sqrt(a^2 + b^2)*b^4) + 2*(3*
a*b*tan(1/2*d*x + 1/2*c)^5 + 6*a^2*tan(1/2*d*x + 1/2*c)^4 + 12*b^2*tan(1/2*
d*x + 1/2*c)^4 - 12*a^2*tan(1/2*d*x + 1/2*c)^2 - 12*b^2*tan(1/2*d*x + 1/2*c
)^2 - 3*a*b*tan(1/2*d*x + 1/2*c) + 6*a^2 + 8*b^2)/((tan(1/2*d*x + 1/2*c)^2
- 1)^3*b^3))/d
```

maple [B] time = 0.47, size = 488, normalized size = 3.49

$$\frac{2\,\mathrm{arctanh}\left(\frac{2a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-2b}{2\sqrt{a^2+b^2}}\right)a^4}{d\,b^4\sqrt{a^2+b^2}}+\frac{4\,\mathrm{arctanh}\left(\frac{2a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-2b}{2\sqrt{a^2+b^2}}\right)a^2}{d\,b^2\sqrt{a^2+b^2}}+\frac{2\,\mathrm{arctanh}\left(\frac{2a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-2b}{2\sqrt{a^2+b^2}}\right)}{d\sqrt{a^2+b^2}}-\frac{1}{3db\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^5/(a+b*tan(d*x+c)),x)
```

```
[Out] 2/d/b^4/(a^2+b^2)^(1/2)*arctanh(1/2*(2*a*tan(1/2*d*x+1/2*c)-2*b)/(a^2+b^2)^
(1/2))*a^4+4/d/b^2/(a^2+b^2)^(1/2)*arctanh(1/2*(2*a*tan(1/2*d*x+1/2*c)-2*b)
/(a^2+b^2)^(1/2))*a^2+2/d/(a^2+b^2)^(1/2)*arctanh(1/2*(2*a*tan(1/2*d*x+1/2*
c)-2*b)/(a^2+b^2)^(1/2))-1/3/d/b/(tan(1/2*d*x+1/2*c)-1)^3-1/2/d/b^2/(tan(1/
2*d*x+1/2*c)-1)^2*a-1/2/d/b/(tan(1/2*d*x+1/2*c)-1)^2-1/d/b^3/(tan(1/2*d*x+1
/2*c)-1)*a^2-1/2/d/b^2/(tan(1/2*d*x+1/2*c)-1)*a-3/2/d/b/(tan(1/2*d*x+1/2*c)
-1)+1/d*a^3/b^4*ln(tan(1/2*d*x+1/2*c)-1)+3/2/d*a/b^2*ln(tan(1/2*d*x+1/2*c)-
1)+1/3/d/b/(tan(1/2*d*x+1/2*c)+1)^3+1/2/d/b^2/(tan(1/2*d*x+1/2*c)+1)^2*a-1/
2/d/b/(tan(1/2*d*x+1/2*c)+1)^2+1/d/b^3/(tan(1/2*d*x+1/2*c)+1)*a^2-1/2/d/b^2
/(tan(1/2*d*x+1/2*c)+1)*a+3/2/d/b/(tan(1/2*d*x+1/2*c)+1)-1/d*a^3/b^4*ln(tan
(1/2*d*x+1/2*c)+1)-3/2/d*a/b^2*ln(tan(1/2*d*x+1/2*c)+1)
```

maxima [B] time = 0.45, size = 361, normalized size = 2.58

$$\frac{\frac{2\left(6a^2+8b^2-\frac{3ab\sin(dx+c)}{\cos(dx+c)+1}+\frac{3ab\sin(dx+c)^5}{(\cos(dx+c)+1)^5}-\frac{12\left(a^2+b^2\right)\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{6\left(a^2+2b^2\right)\sin(dx+c)^4}{(\cos(dx+c)+1)^4}\right)}{b^3-\frac{3b^3\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{3b^3\sin(dx+c)^4}{(\cos(dx+c)+1)^4}-\frac{b^3\sin(dx+c)^6}{(\cos(dx+c)+1)^6}}-\frac{3\left(2a^3+3ab^2\right)\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{b^4}+\frac{3\left(2a^3+3ab^2\right)\log\left(\cdots\right.}{b^4}}{6d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+b*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] 1/6*(2*(6*a^2 + 8*b^2 - 3*a*b*sin(d*x + c)/(cos(d*x + c) + 1) + 3*a*b*sin(d
*x + c)^5/(cos(d*x + c) + 1)^5 - 12*(a^2 + b^2)*sin(d*x + c)^2/(cos(d*x + c
) + 1)^2 + 6*(a^2 + 2*b^2)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4)/(b^3 - 3*b^
3*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 3*b^3*sin(d*x + c)^4/(cos(d*x + c)
+ 1)^4 - b^3*sin(d*x + c)^6/(cos(d*x + c) + 1)^6) - 3*(2*a^3 + 3*a*b^2)*log
```

```
(sin(d*x + c)/(cos(d*x + c) + 1) + 1)/b^4 + 3*(2*a^3 + 3*a*b^2)*log(sin(d*x
 + c)/(cos(d*x + c) + 1) - 1)/b^4 - 6*(a^4 + 2*a^2*b^2 + b^4)*log((b - a*si
n(d*x + c)/(cos(d*x + c) + 1) + sqrt(a^2 + b^2))/(b - a*sin(d*x + c)/(cos(d
*x + c) + 1) - sqrt(a^2 + b^2)))/(sqrt(a^2 + b^2)*b^4))/d
```

mupad [B] time = 5.40, size = 724, normalized size = 5.17

$$b^3\left(\cos\left(c+d\,x\right)+\frac{\cos(2\,c+2\,d\,x)}{2}+\frac{\cos(3\,c+3\,d\,x)}{3}+\frac{5}{6}\right)-b^2\left(\frac{a\,\sin(2\,c+2\,d\,x)}{4}+\frac{3\,a\,\mathrm{atanh}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)\cos(3\,c+3\,d\,x)}{4}+\frac{9\,a\,\cos(c+d\,x)\ldots}{\ldots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^5*(a + b*tan(c + d*x))),x)
```

```
[Out] (b^3*(cos(c + d*x) + cos(2*c + 2*d*x)/2 + cos(3*c + 3*d*x)/3 + 5/6) - b^2*(
(a*sin(2*c + 2*d*x))/4 + (3*a*atanh(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2))*
cos(3*c + 3*d*x))/4 + (9*a*cos(c + d*x)*atanh(sin(c/2 + (d*x)/2)/cos(c/2 +
(d*x)/2)))/4) + b*((3*a^2*cos(c + d*x))/4 + a^2/2 + (a^2*cos(2*c + 2*d*x))/
2 + (a^2*cos(3*c + 3*d*x))/4) + (atanh((a^2*sin(c/2 + (d*x)/2)*(a^6 + b^6 +
 3*a^2*b^4 + 3*a^4*b^2)^(1/2) + 2*b^2*sin(c/2 + (d*x)/2)*(a^6 + b^6 + 3*a^2
*b^4 + 3*a^4*b^2)^(1/2) + a*b*cos(c/2 + (d*x)/2)*(a^6 + b^6 + 3*a^2*b^4 + 3
*a^4*b^2)^(1/2))/(a^5*cos(c/2 + (d*x)/2) + 2*b^5*sin(c/2 + (d*x)/2) + a*b^4
*cos(c/2 + (d*x)/2) + 2*a^4*b*sin(c/2 + (d*x)/2) + 2*a^3*b^2*cos(c/2 + (d*x
)/2) + 4*a^2*b^3*sin(c/2 + (d*x)/2)))*cos(3*c + 3*d*x)*((a^2 + b^2)^3)^(1/2
))/2 - (3*a^3*cos(c + d*x)*atanh(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2)))/2
- (a^3*atanh(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2))*cos(3*c + 3*d*x))/2 + (
3*cos(c + d*x)*atanh((a^2*sin(c/2 + (d*x)/2)*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4
*b^2)^(1/2) + 2*b^2*sin(c/2 + (d*x)/2)*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2)^
(1/2) + a*b*cos(c/2 + (d*x)/2)*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2)^(1/2))/(
a^5*cos(c/2 + (d*x)/2) + 2*b^5*sin(c/2 + (d*x)/2) + a*b^4*cos(c/2 + (d*x)/2
) + 2*a^4*b*sin(c/2 + (d*x)/2) + 2*a^3*b^2*cos(c/2 + (d*x)/2) + 4*a^2*b^3*s
in(c/2 + (d*x)/2)))*((a^2 + b^2)^3)^(1/2))/2)/(b^4*d*((3*cos(c + d*x))/4 +
cos(3*c + 3*d*x)/4))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^5\left(c+dx\right)}{a+b\tan\left(c+dx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**5/(a+b*tan(d*x+c)),x)
```

```
[Out] Integral(sec(c + d*x)**5/(a + b*tan(c + d*x)), x)
```

3.550 $\int \frac{\sec^3(c+dx)}{a+b\tan(c+dx)}\,dx$

Optimal. Leaf size=79

$$-\frac{\sqrt{a^2+b^2}\tanh^{-1}\left(\frac{\cos(c+dx)(b-a\tan(c+dx))}{\sqrt{a^2+b^2}}\right)}{b^2d}-\frac{a\tanh^{-1}(\sin(c+dx))}{b^2d}+\frac{\sec(c+dx)}{bd}$$

```
[Out] -a*arctanh(sin(d*x+c))/b^2/d+sec(d*x+c)/b/d-arctanh(cos(d*x+c)*(b-a*tan(d*x
+c))/(a^2+b^2)^(1/2))*(a^2+b^2)^(1/2)/b^2/d
```

Rubi [A] time = 0.09, antiderivative size = 79, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {3510, 3486, 3770, 3509, 206}

$$-\frac{\sqrt{a^2+b^2}\tanh^{-1}\left(\frac{\cos(c+dx)(b-a\tan(c+dx))}{\sqrt{a^2+b^2}}\right)}{b^2d}-\frac{a\tanh^{-1}(\sin(c+dx))}{b^2d}+\frac{\sec(c+dx)}{bd}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3/(a + b*Tan[c + d*x]),x]
```

```
[Out] -((a*ArcTanh[Sin[c + d*x]])/(b^2*d)) - (Sqrt[a^2 + b^2]*ArcTanh[(Cos[c + d*
x]*(b - a*Tan[c + d*x]))/Sqrt[a^2 + b^2]])/(b^2*d) + Sec[c + d*x]/(b*d)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3509

```
Int[sec[(e_.) + (f_.)*(x_)]/((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]), x_Symbo
l] :> -Dist[f^(-1), Subst[Int[1/(a^2 + b^2 - x^2), x], x, (b - a*Tan[e + f*
x])/Sec[e + f*x]], x] /; FreeQ[{a, b, e, f}, x] && NeQ[a^2 + b^2, 0]
```

Rule 3510

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)/((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)]), x_Symbol] :> -Dist[d^2/b^2, Int[(d*Sec[e + f*x])^(m - 2)*(a - b*Tan[e
 + f*x]), x], x] + Dist[(d^2*(a^2 + b^2))/b^2, Int[(d*Sec[e + f*x])^(m - 2)
/(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 + b^2
, 0] && IGtQ[m, 1]
```

Rule 3770

```
Int[csc[(c_.) + (d_.)*(x_)], x_Symbol] :> -Simp[ArcTanh[Cos[c + d*x]]/d, x]
 /; FreeQ[{c, d}, x]
```

Rubi steps

$$\int \frac{\sec^3(c+dx)}{a+b\tan(c+dx)}\,dx = -\frac{\int \sec(c+dx)(a-b\tan(c+dx))\,dx}{b^2} + \frac{(a^2+b^2)\int \frac{\sec(c+dx)}{a+b\tan(c+dx)}\,dx}{b^2}$$
$$= \frac{\sec(c+dx)}{bd} - \frac{a\int \sec(c+dx)\,dx}{b^2} - \frac{(a^2+b^2)\,\mathrm{Subst}\left(\int \frac{1}{a^2+b^2-x^2}\,dx, x, \cos(c+dx)(b-a$$
$$= -\frac{a\tanh^{-1}(\sin(c+dx))}{b^2d} - \frac{\sqrt{a^2+b^2}\,\tanh^{-1}\left(\frac{\cos(c+dx)(b-a\tan(c+dx))}{\sqrt{a^2+b^2}}\right)}{b^2d} + \frac{\sec(c+dx)}{bd}$$

Mathematica [A] time = 0.16, size = 109, normalized size = 1.38

$$\frac{2\sqrt{a^2+b^2}\,\tanh^{-1}\left(\frac{a\tan\left(\frac{1}{2}(c+dx)\right)-b}{\sqrt{a^2+b^2}}\right) + a\left(\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)-\log\left(\sin\left(\frac{1}{2}(c+dx)\right)+\cos\left(\frac{1}{2}(c\right.\right.\right.}{b^2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^3/(a + b*Tan[c + d*x]),x]
```

```
[Out] (2*Sqrt[a^2 + b^2]*ArcTanh[(-b + a*Tan[(c + d*x)/2])/Sqrt[a^2 + b^2]] + a*(
Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - Log[Cos[(c + d*x)/2] + Sin[(c +
d*x)/2]]) + b*Sec[c + d*x])/(b^2*d)
```

fricas [B] time = 0.78, size = 191, normalized size = 2.42

$$-\frac{a\cos(dx+c)\log(\sin(dx+c)+1) - a\cos(dx+c)\log(-\sin(dx+c)+1) - \sqrt{a^2+b^2}\,\cos(dx+c)\log\left(-\frac{2\,ab\,\mathrm{co}}{}\right.}{2\,b^2d\cos(dx+c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+b*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] -1/2*(a*cos(d*x + c)*log(sin(d*x + c) + 1) - a*cos(d*x + c)*log(-sin(d*x +
c) + 1) - sqrt(a^2 + b^2)*cos(d*x + c)*log(-(2*a*b*cos(d*x + c)*sin(d*x + c
) + (a^2 - b^2)*cos(d*x + c)^2 - 2*a^2 - b^2 + 2*sqrt(a^2 + b^2)*(b*cos(d*x
 + c) - a*sin(d*x + c)))/(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos
(d*x + c)^2 + b^2)) - 2*b)/(b^2*d*cos(d*x + c))
```

giac [A] time = 1.53, size = 136, normalized size = 1.72

$$-\frac{\frac{a\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+1\right|\right)}{b^2} - \frac{a\log\left(\left|\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-1\right|\right)}{b^2} + \frac{\sqrt{a^2+b^2}\,\log\left(\frac{\left|2\,a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-2\,b-2\,\sqrt{a^2+b^2}\right|}{\left|2\,a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-2\,b+2\,\sqrt{a^2+b^2}\right|}\right)}{b^2} + \frac{2}{\left(\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-1\right)b}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+b*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] -(a*log(abs(tan(1/2*d*x + 1/2*c) + 1))/b^2 - a*log(abs(tan(1/2*d*x + 1/2*c)
 - 1))/b^2 + sqrt(a^2 + b^2)*log(abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b - 2*sqr
t(a^2 + b^2))/abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b + 2*sqrt(a^2 + b^2)))/b^2
+ 2/((tan(1/2*d*x + 1/2*c)^2 - 1)*b))/d
```

maple [B] time = 0.45, size = 174, normalized size = 2.20

$$\frac{2\,\mathrm{arctanh}\left(\frac{2a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-2b}{2\sqrt{a^2+b^2}}\right)a^2}{d\,b^2\sqrt{a^2+b^2}}+\frac{2\,\mathrm{arctanh}\left(\frac{2a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-2b}{2\sqrt{a^2+b^2}}\right)}{d\sqrt{a^2+b^2}}-\frac{1}{db\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}+\frac{a\ln\left(\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-1\right)}{d\,b^2}+\ldots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3/(a+b*tan(d*x+c)),x)
```

```
[Out] 2/d/b^2/(a^2+b^2)^(1/2)*arctanh(1/2*(2*a*tan(1/2*d*x+1/2*c)-2*b)/(a^2+b^2)^
(1/2))*a^2+2/d/(a^2+b^2)^(1/2)*arctanh(1/2*(2*a*tan(1/2*d*x+1/2*c)-2*b)/(a^
2+b^2)^(1/2))-1/d/b/(tan(1/2*d*x+1/2*c)-1)+1/d*a/b^2*ln(tan(1/2*d*x+1/2*c)-
1)+1/d/b/(tan(1/2*d*x+1/2*c)+1)-1/d*a/b^2*ln(tan(1/2*d*x+1/2*c)+1)
```

maxima [B] time = 0.44, size = 163, normalized size = 2.06

$$-\frac{\frac{a\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{b^2}-\frac{a\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right)}{b^2}+\frac{\sqrt{a^2+b^2}\,\log\left(\frac{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}+\sqrt{a^2+b^2}}{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}-\sqrt{a^2+b^2}}\right)}{b^2}-\frac{2}{b-\frac{b\sin(dx+c)^2}{(\cos(dx+c)+1)^2}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+b*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] -(a*log(sin(d*x + c)/(cos(d*x + c) + 1) + 1)/b^2 - a*log(sin(d*x + c)/(cos(
d*x + c) + 1) - 1)/b^2 + sqrt(a^2 + b^2)*log((b - a*sin(d*x + c)/(cos(d*x +
 c) + 1) + sqrt(a^2 + b^2))/(b - a*sin(d*x + c)/(cos(d*x + c) + 1) - sqrt(a
^2 + b^2)))/b^2 - 2/(b - b*sin(d*x + c)^2/(cos(d*x + c) + 1)^2))/d
```

mupad [B] time = 3.87, size = 310, normalized size = 3.92

$$\frac{2\,\mathrm{atanh}\left(\frac{64\,a^2\,\sqrt{a^2+b^2}}{64\,a^2\,b+\frac{64\,a^4}{b}+128\,a^3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+128\,a\,b^2\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}+\frac{128\,a\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\sqrt{a^2+b^2}}{64\,a^2+\frac{64\,a^4}{b^2}+\frac{128\,a^3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{b}+128\,a\,b\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}+\frac{64\ldots}{64\,a^4+128\,\tan\left(\frac{c}{2}+\ldots\right.}\ldots\right.}{b^2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^3*(a + b*tan(c + d*x))),x)
```

```
[Out] (2*atanh((64*a^2*(a^2 + b^2)^(1/2))/(64*a^2*b + (64*a^4)/b + 128*a^3*tan(c/
2 + (d*x)/2) + 128*a*b^2*tan(c/2 + (d*x)/2)) + (128*a*tan(c/2 + (d*x)/2)*(a
^2 + b^2)^(1/2))/(64*a^2 + (64*a^4)/b^2 + (128*a^3*tan(c/2 + (d*x)/2))/b +
128*a*b*tan(c/2 + (d*x)/2)) + (64*a^3*tan(c/2 + (d*x)/2)*(a^2 + b^2)^(1/2))
/(64*a^4 + 64*a^2*b^2 + 128*a*b^3*tan(c/2 + (d*x)/2) + 128*a^3*b*tan(c/2 +
(d*x)/2)))*(a^2 + b^2)^(1/2))/(b^2*d) - (2*a*atanh((64*a^2*tan(c/2 + (d*x)/
2))/(64*a^2 + (64*a^4)/b^2) + (64*a^4*tan(c/2 + (d*x)/2))/(64*a^4 + 64*a^2*
b^2)))/(b^2*d) - 2/(b*d*(tan(c/2 + (d*x)/2)^2 - 1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^3(c+dx)}{a+b\tan(c+dx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3/(a+b*tan(d*x+c)),x)
```

```
[Out] Integral(sec(c + d*x)**3/(a + b*tan(c + d*x)), x)
```

3.551 $\int \frac{\sec(c+dx)}{a+b\tan(c+dx)}\,dx$

Optimal. Leaf size=46

$$-\frac{\tanh^{-1}\left(\frac{\cos(c+dx)(b-a\tan(c+dx))}{\sqrt{a^2+b^2}}\right)}{d\sqrt{a^2+b^2}}$$

```
[Out] -arctanh(cos(d*x+c)*(b-a*tan(d*x+c))/(a^2+b^2)^(1/2))/d/(a^2+b^2)^(1/2)
```

Rubi [A] time = 0.03, antiderivative size = 46, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.105$, Rules used = {3509, 206}

$$-\frac{\tanh^{-1}\left(\frac{\cos(c+dx)(b-a\tan(c+dx))}{\sqrt{a^2+b^2}}\right)}{d\sqrt{a^2+b^2}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]/(a + b*Tan[c + d*x]),x]
```

```
[Out] -(ArcTanh[(Cos[c + d*x]*(b - a*Tan[c + d*x]))/Sqrt[a^2 + b^2]]/(Sqrt[a^2 + b^2]*d))
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (GtQ[a, 0] || LtQ[b, 0])
```

Rule 3509

```
Int[sec[(e_.) + (f_.)*(x_)]/((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]), x_Symbol] :> -Dist[f^(-1), Subst[Int[1/(a^2 + b^2 - x^2), x], x, (b - a*Tan[e + f*x])/Sec[e + f*x]], x] /; FreeQ[{a, b, e, f}, x] && NeQ[a^2 + b^2, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec(c+dx)}{a+b\tan(c+dx)}\,dx &= -\frac{\text{Subst}\left(\int \frac{1}{a^2+b^2-x^2}\,dx, x, \cos(c+dx)(b-a\tan(c+dx))\right)}{d}\\ &= -\frac{\tanh^{-1}\left(\frac{\cos(c+dx)(b-a\tan(c+dx))}{\sqrt{a^2+b^2}}\right)}{\sqrt{a^2+b^2}\,d}\end{aligned}$$

Mathematica [A] time = 0.04, size = 45, normalized size = 0.98

$$\frac{2\tanh^{-1}\left(\frac{a\tan\left(\frac{1}{2}(c+dx)\right)-b}{\sqrt{a^2+b^2}}\right)}{d\sqrt{a^2+b^2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]/(a + b*Tan[c + d*x]),x]
```

```
[Out] (2*ArcTanh[(-b + a*Tan[(c + d*x)/2])/Sqrt[a^2 + b^2]])/(Sqrt[a^2 + b^2]*d)
```

fricas [B] time = 0.62, size = 131, normalized size = 2.85

$$\frac{\log\left(-\frac{2\,ab\cos(dx+c)\sin(dx+c)+\left(a^2-b^2\right)\cos(dx+c)^2-2\,a^2-b^2+2\,\sqrt{a^2+b^2}\,(b\cos(dx+c)-a\sin(dx+c))}{2\,ab\cos(dx+c)\sin(dx+c)+\left(a^2-b^2\right)\cos(dx+c)^2+b^2}\right)}{2\,\sqrt{a^2+b^2}\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+b*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/2*log(-(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 - 2*
a^2 - b^2 + 2*sqrt(a^2 + b^2)*(b*cos(d*x + c) - a*sin(d*x + c)))/(2*a*b*cos
(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 + b^2))/(sqrt(a^2 + b^2
)*d)
```

giac [A] time = 0.61, size = 74, normalized size = 1.61

$$-\frac{\log\left(\frac{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2\,b-2\,\sqrt{a^2+b^2}\right|}{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2\,b+2\,\sqrt{a^2+b^2}\right|}\right)}{\sqrt{a^2+b^2}\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+b*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] -log(abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b - 2*sqrt(a^2 + b^2))/abs(2*a*tan(1/
2*d*x + 1/2*c) - 2*b + 2*sqrt(a^2 + b^2)))/(sqrt(a^2 + b^2)*d)
```

maple [A] time = 0.24, size = 43, normalized size = 0.93

$$\frac{2\,\mathrm{arctanh}\left(\frac{2a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-2b}{2\sqrt{a^2+b^2}}\right)}{d\sqrt{a^2+b^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)/(a+b*tan(d*x+c)),x)
```

```
[Out] 2/d/(a^2+b^2)^(1/2)*arctanh(1/2*(2*a*tan(1/2*d*x+1/2*c)-2*b)/(a^2+b^2)^(1/2
))
```

maxima [A] time = 0.43, size = 80, normalized size = 1.74

$$-\frac{\log\left(\frac{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}+\sqrt{a^2+b^2}}{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}-\sqrt{a^2+b^2}}\right)}{\sqrt{a^2+b^2}\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+b*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] -log((b - a*sin(d*x + c)/(cos(d*x + c) + 1) + sqrt(a^2 + b^2))/(b - a*sin(d
*x + c)/(cos(d*x + c) + 1) - sqrt(a^2 + b^2)))/(sqrt(a^2 + b^2)*d)
```

mupad [B] time = 3.75, size = 39, normalized size = 0.85

$$-\frac{2\,\mathrm{atanh}\left(\frac{b-a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\sqrt{a^2+b^2}}\right)}{d\,\sqrt{a^2+b^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)*(a + b*tan(c + d*x))),x)
```

```
[Out] -(2*atanh((b - a*tan(c/2 + (d*x)/2))/(a^2 + b^2)^(1/2)))/(d*(a^2 + b^2)^(1/
2))
```

sympy [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(c+dx)}{a+b\tan(c+dx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+b*tan(d*x+c)),x)
```

```
[Out] Integral(sec(c + d*x)/(a + b*tan(c + d*x)), x)
```

3.552 $\int \frac{\cos(c+dx)}{a+b\tan(c+dx)}\,dx$

Optimal. Leaf size=90

$$\frac{a\sin(c+dx)}{d(a^2+b^2)}+\frac{b\cos(c+dx)}{d(a^2+b^2)}-\frac{b^2\tanh^{-1}\left(\frac{\cos(c+dx)(b-a\tan(c+dx))}{\sqrt{a^2+b^2}}\right)}{d(a^2+b^2)^{3/2}}$$

```
[Out] -b^2*arctanh(cos(d*x+c)*(b-a*tan(d*x+c))/(a^2+b^2)^(1/2))/(a^2+b^2)^(3/2)/d
+b*cos(d*x+c)/(a^2+b^2)/d+a*sin(d*x+c)/(a^2+b^2)/d
```

Rubi [A] time = 0.10, antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {3511, 3486, 2637, 3509, 206}

$$\frac{a\sin(c+dx)}{d(a^2+b^2)}+\frac{b\cos(c+dx)}{d(a^2+b^2)}-\frac{b^2\tanh^{-1}\left(\frac{\cos(c+dx)(b-a\tan(c+dx))}{\sqrt{a^2+b^2}}\right)}{d(a^2+b^2)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]/(a + b*Tan[c + d*x]),x]
```

```
[Out] -((b^2*ArcTanh[(Cos[c + d*x]*(b - a*Tan[c + d*x]))/Sqrt[a^2 + b^2]])/((a^2
+ b^2)^(3/2)*d)) + (b*Cos[c + d*x])/((a^2 + b^2)*d) + (a*Sin[c + d*x])/((a^
2 + b^2)*d)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2637

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3509

```
Int[sec[(e_.) + (f_.)*(x_)]/((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]), x_Symbo
l] :> -Dist[f^(-1), Subst[Int[1/(a^2 + b^2 - x^2), x], x, (b - a*Tan[e + f*
x])/Sec[e + f*x]], x] /; FreeQ[{a, b, e, f}, x] && NeQ[a^2 + b^2, 0]
```

Rule 3511

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)/((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(d*Sec[e + f*x])^m*(a - b*Tan[e
+ f*x]), x], x] + Dist[b^2/(d^2*(a^2 + b^2)), Int[(d*Sec[e + f*x])^(m + 2)/
(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 + b^2,
 0] && ILtQ[m, 0]
```

Rubi steps

$$\int \frac{\cos(c+dx)}{a+b\tan(c+dx)}\,dx = \frac{\int \cos(c+dx)(a-b\tan(c+dx))\,dx}{a^2+b^2} + \frac{b^2\int \frac{\sec(c+dx)}{a+b\tan(c+dx)}\,dx}{a^2+b^2}$$

$$= \frac{b\cos(c+dx)}{\left(a^2+b^2\right)d} + \frac{a\int \cos(c+dx)\,dx}{a^2+b^2} - \frac{b^2\,\mathrm{Subst}\left(\int \frac{1}{a^2+b^2-x^2}\,dx, x, \cos(c+dx)(b-a\tan(\right.}{\left(a^2+b^2\right)d}$$

$$= -\frac{b^2\tanh^{-1}\left(\frac{\cos(c+dx)(b-a\tan(c+dx))}{\sqrt{a^2+b^2}}\right)}{\left(a^2+b^2\right)^{3/2}d} + \frac{b\cos(c+dx)}{\left(a^2+b^2\right)d} + \frac{a\sin(c+dx)}{\left(a^2+b^2\right)d}$$

Mathematica [A] time = 0.31, size = 79, normalized size = 0.88

$$\frac{\sqrt{a^2+b^2}\,(a\sin(c+dx)+b\cos(c+dx)) + 2b^2\tanh^{-1}\left(\frac{a\tan\left(\frac{1}{2}(c+dx)\right)-b}{\sqrt{a^2+b^2}}\right)}{d\left(a^2+b^2\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]/(a + b*Tan[c + d*x]),x]
```

```
[Out] (2*b^2*ArcTanh[(-b + a*Tan[(c + d*x)/2])/Sqrt[a^2 + b^2]] + Sqrt[a^2 + b^2]
*(b*Cos[c + d*x] + a*Sin[c + d*x]))/((a^2 + b^2)^(3/2)*d)
```

fricas [B] time = 0.71, size = 187, normalized size = 2.08

$$\frac{\sqrt{a^2+b^2}\,b^2\log\left(-\frac{2\,ab\cos(dx+c)\sin(dx+c)+\left(a^2-b^2\right)\cos(dx+c)^2-2\,a^2-b^2+2\,\sqrt{a^2+b^2}\,(b\cos(dx+c)-a\sin(dx+c))}{2\,ab\cos(dx+c)\sin(dx+c)+\left(a^2-b^2\right)\cos(dx+c)^2+b^2}\right)+2\left(a^2b+b^3\right)\cos(dx}{2\left(a^4+2\,a^2b^2+b^4\right)d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+b*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/2*(sqrt(a^2 + b^2)*b^2*log(-(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2
)*cos(d*x + c)^2 - 2*a^2 - b^2 + 2*sqrt(a^2 + b^2)*(b*cos(d*x + c) - a*sin(
d*x + c)))/(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 +
b^2)) + 2*(a^2*b + b^3)*cos(d*x + c) + 2*(a^3 + a*b^2)*sin(d*x + c))/((a^4
+ 2*a^2*b^2 + b^4)*d)
```

giac [A] time = 1.20, size = 118, normalized size = 1.31

$$-\frac{\frac{b^2\log\left(\frac{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2\,b-2\,\sqrt{a^2+b^2}\right|}{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2\,b+2\,\sqrt{a^2+b^2}\right|}\right)}{\left(a^2+b^2\right)^{\frac{3}{2}}} - \frac{2\left(a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+b\right)}{\left(a^2+b^2\right)\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+1\right)}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+b*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] -(b^2*log(abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b - 2*sqrt(a^2 + b^2))/abs(2*a*t
an(1/2*d*x + 1/2*c) - 2*b + 2*sqrt(a^2 + b^2)))/(a^2 + b^2)^(3/2) - 2*(a*ta
n(1/2*d*x + 1/2*c) + b)/((a^2 + b^2)*(tan(1/2*d*x + 1/2*c)^2 + 1)))/d
```

maple [A] time = 0.54, size = 90, normalized size = 1.00

$$\frac{\frac{2b^2 \operatorname{arctanh}\left(\frac{2a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-2b}{2\sqrt{a^2+b^2}}\right)}{\left(a^2+b^2\right)^{\frac{3}{2}}}-\frac{2\left(-a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-b\right)}{\left(a^2+b^2\right)\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)/(a+b*tan(d*x+c)),x)
```

```
[Out] 1/d*(2*b^2/(a^2+b^2)^(3/2)*arctanh(1/2*(2*a*tan(1/2*d*x+1/2*c)-2*b)/(a^2+b^
2)^(1/2))-2/(a^2+b^2)*(-a*tan(1/2*d*x+1/2*c)-b)/(1+tan(1/2*d*x+1/2*c)^2))
```

maxima [A] time = 0.44, size = 142, normalized size = 1.58

$$-\frac{\frac{b^2 \log\left(\frac{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}+\sqrt{a^2+b^2}}{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}-\sqrt{a^2+b^2}}\right)}{\left(a^2+b^2\right)^{\frac{3}{2}}}-\frac{2\left(b+\frac{a\sin(dx+c)}{\cos(dx+c)+1}\right)}{a^2+b^2+\frac{\left(a^2+b^2\right)\sin(dx+c)^2}{(\cos(dx+c)+1)^2}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+b*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] -(b^2*log((b - a*sin(d*x + c)/(cos(d*x + c) + 1) + sqrt(a^2 + b^2))/(b - a*
sin(d*x + c)/(cos(d*x + c) + 1) - sqrt(a^2 + b^2)))/(a^2 + b^2)^(3/2) - 2*(
b + a*sin(d*x + c)/(cos(d*x + c) + 1))/(a^2 + b^2 + (a^2 + b^2)*sin(d*x + c
)^2/(cos(d*x + c) + 1)^2))/d
```

mupad [B] time = 3.84, size = 110, normalized size = 1.22

$$\frac{\frac{2\,b}{a^2+b^2}+\frac{2\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{a^2+b^2}}{d\,\left({\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}^2+1\right)}-\frac{2\,b^2\,\mathrm{atanh}\left(\frac{a^2\,b+b^3-a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(a^2+b^2\right)}{{\left(a^2+b^2\right)}^{3/2}}\right)}{d\,{\left(a^2+b^2\right)}^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)/(a + b*tan(c + d*x)),x)
```

```
[Out] ((2*b)/(a^2 + b^2) + (2*a*tan(c/2 + (d*x)/2))/(a^2 + b^2))/(d*(tan(c/2 + (d
*x)/2)^2 + 1)) - (2*b^2*atanh((a^2*b + b^3 - a*tan(c/2 + (d*x)/2)*(a^2 + b^
2))/(a^2 + b^2)^(3/2)))/(d*(a^2 + b^2)^(3/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos(c+dx)}{a+b\tan(c+dx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+b*tan(d*x+c)),x)
```

```
[Out] Integral(cos(c + d*x)/(a + b*tan(c + d*x)), x)
```

3.553 $\int \frac{\cos^3(c+dx)}{a+b\tan(c+dx)}\,dx$

Optimal. Leaf size=165

$$-\frac{a\sin^3(c+dx)}{3d\left(a^2+b^2\right)}+\frac{ab^2\sin(c+dx)}{d\left(a^2+b^2\right)^2}+\frac{a\sin(c+dx)}{d\left(a^2+b^2\right)}+\frac{b\cos^3(c+dx)}{3d\left(a^2+b^2\right)}-\frac{b^4\tanh^{-1}\left(\frac{\cos(c+dx)(b-a\tan(c+dx))}{\sqrt{a^2+b^2}}\right)}{d\left(a^2+b^2\right)^{5/2}}+\frac{b^3\cos(c+dx)}{d\left(a^2+b^2\right)^2}$$

```
[Out] -b^4*arctanh(cos(d*x+c)*(b-a*tan(d*x+c))/(a^2+b^2)^(1/2))/(a^2+b^2)^(5/2)/d
+b^3*cos(d*x+c)/(a^2+b^2)^2/d+1/3*b*cos(d*x+c)^3/(a^2+b^2)/d+a*b^2*sin(d*x+
c)/(a^2+b^2)^2/d+a*sin(d*x+c)/(a^2+b^2)/d-1/3*a*sin(d*x+c)^3/(a^2+b^2)/d
```

Rubi [A] time = 0.19, antiderivative size = 165, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {3511, 3486, 2633, 2637, 3509, 206}

$$-\frac{a\sin^3(c+dx)}{3d\left(a^2+b^2\right)}+\frac{ab^2\sin(c+dx)}{d\left(a^2+b^2\right)^2}+\frac{a\sin(c+dx)}{d\left(a^2+b^2\right)}+\frac{b\cos^3(c+dx)}{3d\left(a^2+b^2\right)}+\frac{b^3\cos(c+dx)}{d\left(a^2+b^2\right)^2}-\frac{b^4\tanh^{-1}\left(\frac{\cos(c+dx)(b-a\tan(c+dx))}{\sqrt{a^2+b^2}}\right)}{d\left(a^2+b^2\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3/(a + b*Tan[c + d*x]),x]
```

```
[Out] -((b^4*ArcTanh[(Cos[c + d*x]*(b - a*Tan[c + d*x]))/Sqrt[a^2 + b^2]])/((a^2
+ b^2)^(5/2)*d)) + (b^3*Cos[c + d*x])/((a^2 + b^2)^2*d) + (b*Cos[c + d*x]^3
)/(3*(a^2 + b^2)*d) + (a*b^2*Sin[c + d*x])/((a^2 + b^2)^2*d) + (a*Sin[c + d
*x])/((a^2 + b^2)*d) - (a*Sin[c + d*x]^3)/(3*(a^2 + b^2)*d)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 2633

```
Int[sin[(c_.) + (d_.)*(x_)]^(n_), x_Symbol] :> -Dist[d^(-1), Subst[Int[Expa
nd[(1 - x^2)^((n - 1)/2), x], x], x, Cos[c + d*x]], x] /; FreeQ[{c, d}, x]
&& IGtQ[(n - 1)/2, 0]
```

Rule 2637

```
Int[sin[Pi/2 + (c_.) + (d_.)*(x_)], x_Symbol] :> Simp[Sin[c + d*x]/d, x] /;
 FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3509

```
Int[sec[(e_.) + (f_.)*(x_)]/((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]), x_Symbo
l] :> -Dist[f^(-1), Subst[Int[1/(a^2 + b^2 - x^2), x], x, (b - a*Tan[e + f*
x])/Sec[e + f*x]], x] /; FreeQ[{a, b, e, f}, x] && NeQ[a^2 + b^2, 0]
```

Rule 3511

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)/((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)]), x_Symbol] :> Dist[1/(a^2 + b^2), Int[(d*Sec[e + f*x])^m*(a - b*Tan[e
+ f*x]), x], x] + Dist[b^2/(d^2*(a^2 + b^2)), Int[(d*Sec[e + f*x])^(m + 2)/
(a + b*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f}, x] && NeQ[a^2 + b^2,
 0] && ILtQ[m, 0]
```

Rubi steps

$$\int \frac{\cos^3(c+dx)}{a+b\tan(c+dx)}\,dx = \frac{\int \cos^3(c+dx)(a-b\tan(c+dx))\,dx}{a^2+b^2} + \frac{b^2\int \frac{\cos(c+dx)}{a+b\tan(c+dx)}\,dx}{a^2+b^2}$$

$$= \frac{b\cos^3(c+dx)}{3\left(a^2+b^2\right)d} + \frac{b^2\int \cos(c+dx)(a-b\tan(c+dx))\,dx}{\left(a^2+b^2\right)^2} + \frac{b^4\int \frac{\sec(c+dx)}{a+b\tan(c+dx)}\,dx}{\left(a^2+b^2\right)^2} + \frac{a\int}{}$$

$$= \frac{b^3\cos(c+dx)}{\left(a^2+b^2\right)^2 d} + \frac{b\cos^3(c+dx)}{3\left(a^2+b^2\right)d} + \frac{\left(ab^2\right)\int \cos(c+dx)\,dx}{\left(a^2+b^2\right)^2} - \frac{b^4\,\mathrm{Subst}\left(\int \frac{1}{a^2+b^2-x^2}\,dx\right.}{}$$

$$= -\frac{b^4\tanh^{-1}\left(\frac{\cos(c+dx)(b-a\tan(c+dx))}{\sqrt{a^2+b^2}}\right)}{\left(a^2+b^2\right)^{5/2}d} + \frac{b^3\cos(c+dx)}{\left(a^2+b^2\right)^2 d} + \frac{b\cos^3(c+dx)}{3\left(a^2+b^2\right)d} + \frac{ab^2\sin(c+}{\left(a^2+b^2\right)^2}$$

Mathematica [A] time = 1.23, size = 137, normalized size = 0.83

$$\frac{\sqrt{a^2+b^2}\left(3b\left(a^2+5b^2\right)\cos(c+dx)+b\left(a^2+b^2\right)\cos(3(c+dx))+2a\sin(c+dx)\left(\left(a^2+b^2\right)\cos(2(c+dx))+5\right.\right.}{12d\left(a^2+b^2\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3/(a + b*Tan[c + d*x]),x]
```

```
[Out] (24*b^4*ArcTanh[(-b + a*Tan[(c + d*x)/2])/Sqrt[a^2 + b^2]] + Sqrt[a^2 + b^2
]*(3*b*(a^2 + 5*b^2)*Cos[c + d*x] + b*(a^2 + b^2)*Cos[3*(c + d*x)] + 2*a*(5
*a^2 + 11*b^2 + (a^2 + b^2)*Cos[2*(c + d*x)])*Sin[c + d*x]))/(12*(a^2 + b^2
)^(5/2)*d)
```

fricas [A] time = 0.78, size = 262, normalized size = 1.59

$$\frac{3\sqrt{a^2+b^2}\,b^4\log\left(-\frac{2ab\cos(dx+c)\sin(dx+c)+\left(a^2-b^2\right)\cos(dx+c)^2-2a^2-b^2+2\sqrt{a^2+b^2}\,(b\cos(dx+c)-a\sin(dx+c))}{2ab\cos(dx+c)\sin(dx+c)+\left(a^2-b^2\right)\cos(dx+c)^2+b^2}\right)+2\left(a^4b+2a^2b^3\right.}{6\left(a^6+3\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+b*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/6*(3*sqrt(a^2 + b^2)*b^4*log(-(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b
^2)*cos(d*x + c)^2 - 2*a^2 - b^2 + 2*sqrt(a^2 + b^2)*(b*cos(d*x + c) - a*si
n(d*x + c)))/(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2
+ b^2)) + 2*(a^4*b + 2*a^2*b^3 + b^5)*cos(d*x + c)^3 + 6*(a^2*b^3 + b^5)*co
s(d*x + c) + 2*(2*a^5 + 7*a^3*b^2 + 5*a*b^4 + (a^5 + 2*a^3*b^2 + a*b^4)*cos
(d*x + c)^2)*sin(d*x + c))/((a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6)*d)
```

giac [A] time = 2.80, size = 286, normalized size = 1.73

$$-\frac{\frac{3\,b^4\log\left(\frac{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2\,b-2\,\sqrt{a^2+b^2}\right|}{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2\,b+2\,\sqrt{a^2+b^2}\right|}\right)}{\left(a^4+2\,a^2b^2+b^4\right)\sqrt{a^2+b^2}}-\frac{2\left(3\,a^3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5+6\,ab^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5+3\,a^2b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^4+6\,b^3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^4+2\,a^3\tan\left(\frac{1}{2}\,a\right.}{\left(a^4+2\,a^2b^2+b^4\right)\left(\right.}}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+b*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] -1/3*(3*b^4*log(abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b - 2*sqrt(a^2 + b^2))/abs
(2*a*tan(1/2*d*x + 1/2*c) - 2*b + 2*sqrt(a^2 + b^2)))/((a^4 + 2*a^2*b^2 + b
^4)*sqrt(a^2 + b^2)) - 2*(3*a^3*tan(1/2*d*x + 1/2*c)^5 + 6*a*b^2*tan(1/2*d*
x + 1/2*c)^5 + 3*a^2*b*tan(1/2*d*x + 1/2*c)^4 + 6*b^3*tan(1/2*d*x + 1/2*c)^
4 + 2*a^3*tan(1/2*d*x + 1/2*c)^3 + 8*a*b^2*tan(1/2*d*x + 1/2*c)^3 + 6*b^3*t
an(1/2*d*x + 1/2*c)^2 + 3*a^3*tan(1/2*d*x + 1/2*c) + 6*a*b^2*tan(1/2*d*x +
1/2*c) + a^2*b + 4*b^3)/((a^4 + 2*a^2*b^2 + b^4)*(tan(1/2*d*x + 1/2*c)^2 +
1)^3))/d
```

maple [A] time = 0.54, size = 221, normalized size = 1.34

$$\frac{\frac{2b^4\,\mathrm{arctanh}\left(\frac{2a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-2b}{2\sqrt{a^2+b^2}}\right)}{\left(a^4+2a^2b^2+b^4\right)\sqrt{a^2+b^2}}-\frac{2\left(\left(-a^3-2b^2a\right)\left(\tan^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(-a^2b-2b^3\right)\left(\tan^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(-\frac{2}{3}a^3-\frac{8}{3}b^2a\right)\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2b^3\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(-a^3-2\right.\right.}{\left(a^4+2a^2b^2+b^4\right)\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)^3}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3/(a+b*tan(d*x+c)),x)
```

```
[Out] 1/d*(2*b^4/(a^4+2*a^2*b^2+b^4)/(a^2+b^2)^(1/2)*arctanh(1/2*(2*a*tan(1/2*d*x
+1/2*c)-2*b)/(a^2+b^2)^(1/2))-2/(a^4+2*a^2*b^2+b^4)*((-a^3-2*a*b^2)*tan(1/2
*d*x+1/2*c)^5+(-a^2*b-2*b^3)*tan(1/2*d*x+1/2*c)^4+(-2/3*a^3-8/3*b^2*a)*tan(
1/2*d*x+1/2*c)^3-2*b^3*tan(1/2*d*x+1/2*c)^2+(-a^3-2*a*b^2)*tan(1/2*d*x+1/2*
c)-1/3*a^2*b-4/3*b^3)/(1+tan(1/2*d*x+1/2*c)^2)^3)
```

maxima [B] time = 0.47, size = 379, normalized size = 2.30

$$-\frac{\frac{3\,b^4\log\left(\frac{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}+\sqrt{a^2+b^2}}{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}-\sqrt{a^2+b^2}}\right)}{\left(a^4+2\,a^2b^2+b^4\right)\sqrt{a^2+b^2}}-\frac{2\left(a^2b+4\,b^3+\frac{6\,b^3\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{3\left(a^3+2\,ab^2\right)\sin(dx+c)}{\cos(dx+c)+1}+\frac{2\left(a^3+4\,ab^2\right)\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{3\left(a^2b+2\,b^3\right)\sin(dx+c)^4}{(\cos(dx+c)+1)^4}+\frac{3\left(a^3+2\,ab^2\right)\sin(dx\right.}{(\cos(dx+c)+1)^5}}{a^4+2\,a^2b^2+b^4+\frac{3\left(a^4+2\,a^2b^2+b^4\right)\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{3\left(a^4+2\,a^2b^2+b^4\right)\sin(dx+c)^4}{(\cos(dx+c)+1)^4}+\frac{\left(a^4+2\,a^2b^2+b^4\right)\sin(dx+c)^6}{(\cos(dx+c)+1)^6}}}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+b*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] -1/3*(3*b^4*log((b - a*sin(d*x + c)/(cos(d*x + c) + 1) + sqrt(a^2 + b^2))/(
b - a*sin(d*x + c)/(cos(d*x + c) + 1) - sqrt(a^2 + b^2)))/((a^4 + 2*a^2*b^2
 + b^4)*sqrt(a^2 + b^2)) - 2*(a^2*b + 4*b^3 + 6*b^3*sin(d*x + c)^2/(cos(d*x
 + c) + 1)^2 + 3*(a^3 + 2*a*b^2)*sin(d*x + c)/(cos(d*x + c) + 1) + 2*(a^3 +
 4*a*b^2)*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 3*(a^2*b + 2*b^3)*sin(d*x +
 c)^4/(cos(d*x + c) + 1)^4 + 3*(a^3 + 2*a*b^2)*sin(d*x + c)^5/(cos(d*x + c)
 + 1)^5)/(a^4 + 2*a^2*b^2 + b^4 + 3*(a^4 + 2*a^2*b^2 + b^4)*sin(d*x + c)^2/
(cos(d*x + c) + 1)^2 + 3*(a^4 + 2*a^2*b^2 + b^4)*sin(d*x + c)^4/(cos(d*x +
c) + 1)^4 + (a^4 + 2*a^2*b^2 + b^4)*sin(d*x + c)^6/(cos(d*x + c) + 1)^6))/d
```

mupad [B] time = 6.34, size = 342, normalized size = 2.07

$$\frac{\frac{\frac{2a^2b}{3}+\frac{8b^3}{3}}{a^4+2a^2b^2+b^4}+\frac{4b^3\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^2}{a^4+2a^2b^2+b^4}+\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^5\left(2a^3+4ab^2\right)}{a^4+2a^2b^2+b^4}+\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^3\left(\frac{4a^3}{3}+\frac{16ab^2}{3}\right)}{a^4+2a^2b^2+b^4}+\frac{2\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\left(a^3+2ab^2\right)}{a^4+2a^2b^2+b^4}+\frac{2b\tan\left(\frac{c}{2}+\frac{dx}{2}\right.}{a^4+2a^2}}{d\left(\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^6+3\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^4+3\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3/(a + b*tan(c + d*x)),x)
```

```
[Out] ((((2*a^2*b)/3 + (8*b^3)/3)/(a^4 + b^4 + 2*a^2*b^2) + (4*b^3*tan(c/2 + (d*x)
/2)^2)/(a^4 + b^4 + 2*a^2*b^2) + (tan(c/2 + (d*x)/2)^5*(4*a*b^2 + 2*a^3))/(
a^4 + b^4 + 2*a^2*b^2) + (tan(c/2 + (d*x)/2)^3*((16*a*b^2)/3 + (4*a^3)/3))/
(a^4 + b^4 + 2*a^2*b^2) + (2*tan(c/2 + (d*x)/2)*(2*a*b^2 + a^3))/(a^4 + b^4
 + 2*a^2*b^2) + (2*b*tan(c/2 + (d*x)/2)^4*(a^2 + 2*b^2))/(a^4 + b^4 + 2*a^2
*b^2))/(d*(3*tan(c/2 + (d*x)/2)^2 + 3*tan(c/2 + (d*x)/2)^4 + tan(c/2 + (d*x
)/2)^6 + 1)) - (2*b^4*atanh((a^4*b + b^5 + 2*a^2*b^3 - a*tan(c/2 + (d*x)/2)
*(a^4 + b^4 + 2*a^2*b^2))/(a^2 + b^2)^(5/2)))/(d*(a^2 + b^2)^(5/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos^3(c+dx)}{a+b\tan(c+dx)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3/(a+b*tan(d*x+c)),x)
```

```
[Out] Integral(cos(c + d*x)**3/(a + b*tan(c + d*x)), x)
```

3.554 $\int \frac{\sec^8(c+dx)}{(a+b\tan(c+dx))^2}\,dx$

Optimal. Leaf size=178

$$-\frac{\left(a^2+b^2\right)^3}{b^7d(a+b\tan(c+dx))}-\frac{6a\left(a^2+b^2\right)^2\log(a+b\tan(c+dx))}{b^7d}-\frac{a\left(2a^2+3b^2\right)\tan^2(c+dx)}{b^5d}+\frac{\left(a^2+b^2\right)\tan^3(c+dx}{b^4d}$$

```
[Out] -6*a*(a^2+b^2)^2*ln(a+b*tan(d*x+c))/b^7/d+(5*a^4+9*a^2*b^2+3*b^4)*tan(d*x+c
)/b^6/d-a*(2*a^2+3*b^2)*tan(d*x+c)^2/b^5/d+(a^2+b^2)*tan(d*x+c)^3/b^4/d-1/2
*a*tan(d*x+c)^4/b^3/d+1/5*tan(d*x+c)^5/b^2/d-(a^2+b^2)^3/b^7/d/(a+b*tan(d*x
+c))
```

Rubi [A] time = 0.15, antiderivative size = 178, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {3506, 697}

$$\frac{\left(a^2+b^2\right)\tan^3(c+dx)}{b^4d}-\frac{a\left(2a^2+3b^2\right)\tan^2(c+dx)}{b^5d}+\frac{\left(9a^2b^2+5a^4+3b^4\right)\tan(c+dx)}{b^6d}-\frac{\left(a^2+b^2\right)^3}{b^7d(a+b\tan(c+dx))}-6a$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^8/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (-6*a*(a^2 + b^2)^2*Log[a + b*Tan[c + d*x]])/(b^7*d) + ((5*a^4 + 9*a^2*b^2
+ 3*b^4)*Tan[c + d*x])/(b^6*d) - (a*(2*a^2 + 3*b^2)*Tan[c + d*x]^2)/(b^5*d)
 + ((a^2 + b^2)*Tan[c + d*x]^3)/(b^4*d) - (a*Tan[c + d*x]^4)/(2*b^3*d) + Ta
n[c + d*x]^5/(5*b^2*d) - (a^2 + b^2)^3/(b^7*d*(a + b*Tan[c + d*x]))
```

Rule 697

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m},
 x] && NeQ[c*d^2 + a*e^2, 0] && IGtQ[p, 0]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^8(c+dx)}{(a+b\tan(c+dx))^2}\,dx &= \frac{\text{Subst}\left(\int \frac{\left(1+\frac{x^2}{b^2}\right)^3}{(a+x)^2}\,dx,x,b\tan(c+dx)\right)}{bd}\\ &= \frac{\text{Subst}\left(\int \left(\frac{5a^4+9a^2b^2+3b^4}{b^6}-\frac{2a\left(2a^2+3b^2\right)x}{b^6}+\frac{3\left(a^2+b^2\right)x^2}{b^6}-\frac{2ax^3}{b^6}+\frac{x^4}{b^6}+\frac{\left(a^2+b^2\right)^3}{b^6(a+x)^2}-\frac{6a\left(a^2+b^2\right)^2}{b^6(a+x)}\right)\right.}{bd}\\ &= -\frac{6a\left(a^2+b^2\right)^2\log(a+b\tan(c+dx))}{b^7d}+\frac{\left(5a^4+9a^2b^2+3b^4\right)\tan(c+dx)}{b^6d}-\frac{a\left(2a^2+\right.}{}\end{aligned}$$

Mathematica [A] time = 2.37, size = 229, normalized size = 1.29

$$\frac{b^4\sec^4(c+dx)\left(a^2-3ab\tan(c+dx)+4b^2\right)-2\left(-2a^2b^4\tan^4(c+dx)+30a^2\left(a^2+b^2\right)^2\log(a+b\tan(c+dx))\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^8/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (2*b^6*Sec[c + d*x]^6 + b^4*Sec[c + d*x]^4*(a^2 + 4*b^2 - 3*a*b*Tan[c + d*x
]) - 2*(8*(a^2 + b^2)^3 + 30*a^2*(a^2 + b^2)^2*Log[a + b*Tan[c + d*x]] + 2*
a*b*(-11*a^4 - 18*a^2*b^2 - 4*b^4 + 15*(a^2 + b^2)^2*Log[a + b*Tan[c + d*x]
])*Tan[c + d*x] - b^2*(15*a^4 + 29*a^2*b^2 + 8*b^4)*Tan[c + d*x]^2 + a*b^3*
(5*a^2 + 7*b^2)*Tan[c + d*x]^3 - 2*a^2*b^4*Tan[c + d*x]^4))/(10*b^7*d*(a +
b*Tan[c + d*x]))
```

fricas [B] time = 0.86, size = 386, normalized size = 2.17

$$-\frac{4\left(15a^4b^2+25a^2b^4+8b^6\right)\cos\left(dx+c\right)^6-2b^6-2\left(15a^4b^2+25a^2b^4+8b^6\right)\cos\left(dx+c\right)^4-\left(5a^2b^4+4b^6\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -1/10*(4*(15*a^4*b^2 + 25*a^2*b^4 + 8*b^6)*cos(d*x + c)^6 - 2*b^6 - 2*(15*a
^4*b^2 + 25*a^2*b^4 + 8*b^6)*cos(d*x + c)^4 - (5*a^2*b^4 + 4*b^6)*cos(d*x +
 c)^2 + 30*((a^6 + 2*a^4*b^2 + a^2*b^4)*cos(d*x + c)^6 + (a^5*b + 2*a^3*b^3
 + a*b^5)*cos(d*x + c)^5*sin(d*x + c))*log(2*a*b*cos(d*x + c)*sin(d*x + c)
+ (a^2 - b^2)*cos(d*x + c)^2 + b^2) - 30*((a^6 + 2*a^4*b^2 + a^2*b^4)*cos(d
*x + c)^6 + (a^5*b + 2*a^3*b^3 + a*b^5)*cos(d*x + c)^5*sin(d*x + c))*log(co
s(d*x + c)^2) + (3*a*b^5*cos(d*x + c) - 4*(15*a^5*b + 25*a^3*b^3 + 8*a*b^5)
*cos(d*x + c)^5 + 2*(5*a^3*b^3 + 7*a*b^5)*cos(d*x + c)^3)*sin(d*x + c))/(a*
b^7*d*cos(d*x + c)^6 + b^8*d*cos(d*x + c)^5*sin(d*x + c))
```

giac [A] time = 4.96, size = 253, normalized size = 1.42

$$-\frac{\frac{60\left(a^5+2a^3b^2+ab^4\right)\log(|b\tan(dx+c)+a|)}{b^7}-\frac{10\left(6a^5b\tan(dx+c)+12a^3b^3\tan(dx+c)+6ab^5\tan(dx+c)+5a^6+9a^4b^2+3a^2b^4-b^6\right)}{(b\tan(dx+c)+a)b^7}-\frac{2b^8\tan(dx+c}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -1/10*(60*(a^5 + 2*a^3*b^2 + a*b^4)*log(abs(b*tan(d*x + c) + a))/b^7 - 10*(
6*a^5*b*tan(d*x + c) + 12*a^3*b^3*tan(d*x + c) + 6*a*b^5*tan(d*x + c) + 5*a
^6 + 9*a^4*b^2 + 3*a^2*b^4 - b^6)/((b*tan(d*x + c) + a)*b^7) - (2*b^8*tan(d
*x + c)^5 - 5*a*b^7*tan(d*x + c)^4 + 10*a^2*b^6*tan(d*x + c)^3 + 10*b^8*tan
(d*x + c)^3 - 20*a^3*b^5*tan(d*x + c)^2 - 30*a*b^7*tan(d*x + c)^2 + 50*a^4*
b^4*tan(d*x + c) + 90*a^2*b^6*tan(d*x + c) + 30*b^8*tan(d*x + c))/b^10)/d
```

maple [A] time = 0.49, size = 305, normalized size = 1.71

$$\frac{\tan^5(dx+c)}{5b^2d}-\frac{a\left(\tan^4(dx+c)\right)}{2b^3d}+\frac{\left(\tan^3(dx+c)\right)a^2}{d\,b^4}+\frac{\tan^3(dx+c)}{b^2d}-\frac{2a^3\left(\tan^2(dx+c)\right)}{d\,b^5}-\frac{3a\left(\tan^2(dx+c)\right)}{b^3d}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^8/(a+b*tan(d*x+c))^2,x)
```

```
[Out] 1/5*tan(d*x+c)^5/b^2/d-1/2*a*tan(d*x+c)^4/b^3/d+1/d/b^4*tan(d*x+c)^3*a^2+ta
n(d*x+c)^3/b^2/d-2/d/b^5*a^3*tan(d*x+c)^2-3*a*tan(d*x+c)^2/b^3/d+5/d/b^6*a^
4*tan(d*x+c)+9/d/b^4*a^2*tan(d*x+c)+3*tan(d*x+c)/b^2/d-6/d*a^5/b^7*ln(a+b*t
an(d*x+c))-12/d*a^3/b^5*ln(a+b*tan(d*x+c))-6*a*ln(a+b*tan(d*x+c))/b^3/d-1/d
/b^7/(a+b*tan(d*x+c))*a^6-3/d/b^5/(a+b*tan(d*x+c))*a^4-3/d/b^3/(a+b*tan(d*x
+c))*a^2-1/b/d/(a+b*tan(d*x+c))
```

maxima [A] time = 0.35, size = 186, normalized size = 1.04

$$-\frac{\frac{10\left(a^6+3a^4b^2+3a^2b^4+b^6\right)}{b^8\tan(dx+c)+ab^7}-\frac{2b^4\tan(dx+c)^5-5ab^3\tan(dx+c)^4+10\left(a^2b^2+b^4\right)\tan(dx+c)^3-10\left(2a^3b+3ab^3\right)\tan(dx+c)^2+10\left(5a^4+9a^2b^2+3b^4\right)\tan(\cdots}{b^6}\cdots}{10d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/10*(10*(a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6)/(b^8*tan(d*x + c) + a*b^7) -
(2*b^4*tan(d*x + c)^5 - 5*a*b^3*tan(d*x + c)^4 + 10*(a^2*b^2 + b^4)*tan(d*x
 + c)^3 - 10*(2*a^3*b + 3*a*b^3)*tan(d*x + c)^2 + 10*(5*a^4 + 9*a^2*b^2 + 3
*b^4)*tan(d*x + c))/b^6 + 60*(a^5 + 2*a^3*b^2 + a*b^4)*log(b*tan(d*x + c) +
 a)/b^7)/d
```

mupad [B] time = 3.63, size = 258, normalized size = 1.45

$$\frac{\tan(c+dx)^2\left(\frac{a^3}{b^5}-\frac{a\left(\frac{3}{b^2}+\frac{3a^2}{b^4}\right)}{b}\right)}{d}+\frac{\tan(c+dx)^5}{5b^2d}+\frac{\tan(c+dx)^3\left(\frac{1}{b^2}+\frac{a^2}{b^4}\right)}{d}-\frac{\tan(c+dx)\left(\frac{a^2\left(\frac{3}{b^2}+\frac{3a^2}{b^4}\right)}{b^2}-\frac{3}{b^2}+\frac{2a\left(\frac{2a^3}{b^5}\cdots\right.}{\cdots}\right.}{d}\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^8*(a + b*tan(c + d*x))^2),x)
```

```
[Out] (tan(c + d*x)^2*(a^3/b^5 - (a*(3/b^2 + (3*a^2)/b^4))/b))/d + tan(c + d*x)^5
/(5*b^2*d) + (tan(c + d*x)^3*(1/b^2 + a^2/b^4))/d - (tan(c + d*x)*((a^2*(3/
b^2 + (3*a^2)/b^4))/b^2 - 3/b^2 + (2*a*((2*a^3)/b^5 - (2*a*(3/b^2 + (3*a^2)
/b^4))/b))/b))/d - (a*tan(c + d*x)^4)/(2*b^3*d) - (log(a + b*tan(c + d*x))*
(6*a*b^4 + 6*a^5 + 12*a^3*b^2))/(b^7*d) - (a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^
2)/(b*d*(a*b^6 + b^7*tan(c + d*x)))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^8(c+dx)}{(a+b\tan(c+dx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8/(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral(sec(c + d*x)**8/(a + b*tan(c + d*x))**2, x)
```

3.555 $\int \frac{\sec^6(c+dx)}{(a+b\tan(c+dx))^2}\,dx$

Optimal. Leaf size=116

$$-\frac{\left(a^2+b^2\right)^2}{b^5d(a+b\tan(c+dx))}-\frac{4a\left(a^2+b^2\right)\log(a+b\tan(c+dx))}{b^5d}+\frac{\left(3a^2+2b^2\right)\tan(c+dx)}{b^4d}-\frac{a\tan^2(c+dx)}{b^3d}+\frac{\tan^3(\ldots}{3\ldots}$$

```
[Out] -4*a*(a^2+b^2)*ln(a+b*tan(d*x+c))/b^5/d+(3*a^2+2*b^2)*tan(d*x+c)/b^4/d-a*ta
n(d*x+c)^2/b^3/d+1/3*tan(d*x+c)^3/b^2/d-(a^2+b^2)^2/b^5/d/(a+b*tan(d*x+c))
```

Rubi [A] time = 0.10, antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {3506, 697}

$$\frac{\left(3a^2+2b^2\right)\tan(c+dx)}{b^4d}-\frac{\left(a^2+b^2\right)^2}{b^5d(a+b\tan(c+dx))}-\frac{4a\left(a^2+b^2\right)\log(a+b\tan(c+dx))}{b^5d}-\frac{a\tan^2(c+dx)}{b^3d}+\frac{\tan^3(c\ldots}{3b^2\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (-4*a*(a^2 + b^2)*Log[a + b*Tan[c + d*x]])/(b^5*d) + ((3*a^2 + 2*b^2)*Tan[c
 + d*x])/(b^4*d) - (a*Tan[c + d*x]^2)/(b^3*d) + Tan[c + d*x]^3/(3*b^2*d) -
(a^2 + b^2)^2/(b^5*d*(a + b*Tan[c + d*x]))
```

Rule 697

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m},
 x] && NeQ[c*d^2 + a*e^2, 0] && IGtQ[p, 0]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^6(c+dx)}{(a+b\tan(c+dx))^2}\,dx &= \frac{\text{Subst}\left(\int \frac{\left(1+\frac{x^2}{b^2}\right)^2}{(a+x)^2}\,dx, x, b\tan(c+dx)\right)}{bd}\\ &= \frac{\text{Subst}\left(\int \left(\frac{3a^2+2b^2}{b^4}-\frac{2ax}{b^4}+\frac{x^2}{b^4}+\frac{\left(a^2+b^2\right)^2}{b^4(a+x)^2}-\frac{4a\left(a^2+b^2\right)}{b^4(a+x)}\right)dx, x, b\tan(c+dx)\right)}{bd}\\ &= -\frac{4a\left(a^2+b^2\right)\log(a+b\tan(c+dx))}{b^5d}+\frac{\left(3a^2+2b^2\right)\tan(c+dx)}{b^4d}-\frac{a\tan^2(c+dx)}{b^3d}\end{aligned}$$

Mathematica [A] time = 2.79, size = 122, normalized size = 1.05

$$\frac{4b\left(2a^2+b^2\right)\tan(c+dx)+\frac{b^4\sec^4(c+dx)-4\left(a^2+b^2\right)\left(3a^2\log(a+b\tan(c+dx))+a^2+3ab\tan(c+dx)\log(a+b\tan(c+dx))+b^2\right)}{a+b\tan(c+dx)}-2ab^2\tan^2\ldots}{3b^5d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (4*b*(2*a^2 + b^2)*Tan[c + d*x] - 2*a*b^2*Tan[c + d*x]^2 + (b^4*Sec[c + d*x
]^4 - 4*(a^2 + b^2)*(a^2 + b^2 + 3*a^2*Log[a + b*Tan[c + d*x]] + 3*a*b*Log[
a + b*Tan[c + d*x]]*Tan[c + d*x]))/(a + b*Tan[c + d*x]))/(3*b^5*d)
```

fricas [B] time = 0.71, size = 281, normalized size = 2.42

$$-\frac{4\left(3\,a^2b^2+2\,b^4\right)\cos\left(dx+c\right)^4-b^4-2\left(3\,a^2b^2+2\,b^4\right)\cos\left(dx+c\right)^2+6\left(\left(a^4+a^2b^2\right)\cos\left(dx+c\right)^4+\left(a^3b+ab^3\right)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -1/3*(4*(3*a^2*b^2 + 2*b^4)*cos(d*x + c)^4 - b^4 - 2*(3*a^2*b^2 + 2*b^4)*co
s(d*x + c)^2 + 6*((a^4 + a^2*b^2)*cos(d*x + c)^4 + (a^3*b + a*b^3)*cos(d*x
+ c)^3*sin(d*x + c))*log(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(
d*x + c)^2 + b^2) - 6*((a^4 + a^2*b^2)*cos(d*x + c)^4 + (a^3*b + a*b^3)*cos
(d*x + c)^3*sin(d*x + c))*log(cos(d*x + c)^2) + 2*(a*b^3*cos(d*x + c) - 2*(
3*a^3*b + 2*a*b^3)*cos(d*x + c)^3)*sin(d*x + c))/(a*b^5*d*cos(d*x + c)^4 +
b^6*d*cos(d*x + c)^3*sin(d*x + c))
```

giac [A] time = 1.58, size = 149, normalized size = 1.28

$$-\frac{\frac{12\left(a^3+ab^2\right)\log\left(|b\tan(dx+c)+a|\right)}{b^5}-\frac{b^4\tan(dx+c)^3-3\,ab^3\tan(dx+c)^2+9\,a^2b^2\tan(dx+c)+6\,b^4\tan(dx+c)}{b^6}-\frac{3\left(4\,a^3b\tan(dx+c)+4\,ab^3\tan(dx+c)+3\,a^4\right.}{(b\tan(dx+c)+a)b^5}}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -1/3*(12*(a^3 + a*b^2)*log(abs(b*tan(d*x + c) + a))/b^5 - (b^4*tan(d*x + c)
^3 - 3*a*b^3*tan(d*x + c)^2 + 9*a^2*b^2*tan(d*x + c) + 6*b^4*tan(d*x + c))/
b^6 - 3*(4*a^3*b*tan(d*x + c) + 4*a*b^3*tan(d*x + c) + 3*a^4 + 2*a^2*b^2 -
b^4)/((b*tan(d*x + c) + a)*b^5))/d
```

maple [A] time = 0.46, size = 174, normalized size = 1.50

$$\frac{\tan^3\left(dx+c\right)}{3b^2d}-\frac{a\left(\tan^2\left(dx+c\right)\right)}{b^3d}+\frac{3a^2\tan\left(dx+c\right)}{d\,b^4}+\frac{2\tan\left(dx+c\right)}{b^2d}-\frac{4a^3\ln\left(a+b\tan\left(dx+c\right)\right)}{d\,b^5}-\frac{4a\ln\left(a+b\tan\left(d\right.\right.}{b^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6/(a+b*tan(d*x+c))^2,x)
```

```
[Out] 1/3*tan(d*x+c)^3/b^2/d-a*tan(d*x+c)^2/b^3/d+3/d/b^4*a^2*tan(d*x+c)+2*tan(d*
x+c)/b^2/d-4/d*a^3/b^5*ln(a+b*tan(d*x+c))-4*a*ln(a+b*tan(d*x+c))/b^3/d-1/d/
b^5/(a+b*tan(d*x+c))*a^4-2/d/b^3/(a+b*tan(d*x+c))*a^2-1/b/d/(a+b*tan(d*x+c)
)
```

maxima [A] time = 0.33, size = 115, normalized size = 0.99

$$-\frac{\frac{3\left(a^4+2\,a^2b^2+b^4\right)}{b^6\tan(dx+c)+ab^5}-\frac{b^2\tan(dx+c)^3-3\,ab\tan(dx+c)^2+3\left(3\,a^2+2\,b^2\right)\tan(dx+c)}{b^4}+\frac{12\left(a^3+ab^2\right)\log(b\tan(dx+c)+a)}{b^5}}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/3*(3*(a^4 + 2*a^2*b^2 + b^4)/(b^6*tan(d*x + c) + a*b^5) - (b^2*tan(d*x +
 c)^3 - 3*a*b*tan(d*x + c)^2 + 3*(3*a^2 + 2*b^2)*tan(d*x + c))/b^4 + 12*(a^
3 + a*b^2)*log(b*tan(d*x + c) + a)/b^5)/d
```

mupad [B] time = 3.71, size = 130, normalized size = 1.12

$$\frac{\tan\left(c+d\,x\right)^3}{3\,b^2\,d}+\frac{\tan\left(c+d\,x\right)\,\left(\frac{2}{b^2}+\frac{3\,a^2}{b^4}\right)}{d}-\frac{a\,\tan\left(c+d\,x\right)^2}{b^3\,d}-\frac{\ln\left(a+b\,\tan\left(c+d\,x\right)\right)\,\left(4\,a^3+4\,a\,b^2\right)}{b^5\,d}-\frac{a^4+2\,\ldots}{b\,d\,\left(\tan\left(c+\ldots\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^6*(a + b*tan(c + d*x))^2),x)
```

```
[Out] tan(c + d*x)^3/(3*b^2*d) + (tan(c + d*x)*(2/b^2 + (3*a^2)/b^4))/d - (a*tan(
c + d*x)^2)/(b^3*d) - (log(a + b*tan(c + d*x))*(4*a*b^2 + 4*a^3))/(b^5*d) -
 (a^4 + b^4 + 2*a^2*b^2)/(b*d*(a*b^4 + b^5*tan(c + d*x)))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^{6}\left(c+dx\right)}{\left(a+b\tan\left(c+dx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6/(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral(sec(c + d*x)**6/(a + b*tan(c + d*x))**2, x)
```

3.556 $\int \frac{\sec^4(c+dx)}{(a+b\tan(c+dx))^2}\,dx$

Optimal. Leaf size=61

$$-\frac{a^2+b^2}{b^3d(a+b\tan(c+dx))}-\frac{2a\log(a+b\tan(c+dx))}{b^3d}+\frac{\tan(c+dx)}{b^2d}$$

```
[Out] -2*a*ln(a+b*tan(d*x+c))/b^3/d+tan(d*x+c)/b^2/d+(-a^2-b^2)/b^3/d/(a+b*tan(d*
x+c))
```

Rubi [A] time = 0.07, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {3506, 697}

$$-\frac{a^2+b^2}{b^3d(a+b\tan(c+dx))}-\frac{2a\log(a+b\tan(c+dx))}{b^3d}+\frac{\tan(c+dx)}{b^2d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (-2*a*Log[a + b*Tan[c + d*x]])/(b^3*d) + Tan[c + d*x]/(b^2*d) - (a^2 + b^2)
/(b^3*d*(a + b*Tan[c + d*x]))
```

Rule 697

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m},
 x] && NeQ[c*d^2 + a*e^2, 0] && IGtQ[p, 0]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^4(c+dx)}{(a+b\tan(c+dx))^2}\,dx &= \frac{\text{Subst}\left(\int \frac{1+\frac{x^2}{b^2}}{(a+x)^2}\,dx, x, b\tan(c+dx)\right)}{bd}\\ &= \frac{\text{Subst}\left(\int \left(\frac{1}{b^2}+\frac{a^2+b^2}{b^2(a+x)^2}-\frac{2a}{b^2(a+x)}\right)dx, x, b\tan(c+dx)\right)}{bd}\\ &= -\frac{2a\log(a+b\tan(c+dx))}{b^3d}+\frac{\tan(c+dx)}{b^2d}-\frac{a^2+b^2}{b^3d(a+b\tan(c+dx))}\end{aligned}$$

Mathematica [A] time = 0.07, size = 51, normalized size = 0.84

$$\frac{-\frac{a^2+b^2}{a+b\tan(c+dx)}-2a\log(a+b\tan(c+dx))+b\tan(c+dx)}{b^3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (-2*a*Log[a + b*Tan[c + d*x]] + b*Tan[c + d*x] - (a^2 + b^2)/(a + b*Tan[c + d*x]))/(b^3*d)
```

fricas [B] time = 0.59, size = 178, normalized size = 2.92

$$-\frac{2 b^2 \cos (dx+c)^2 - 2 ab \cos (dx+c) \sin (dx+c) - b^2 + \left(a^2 \cos (dx+c)^2 + ab \cos (dx+c) \sin (dx+c)\right) \log \left(\right.}{ab^3 d \cos (dx+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -(2*b^2*cos(d*x + c)^2 - 2*a*b*cos(d*x + c)*sin(d*x + c) - b^2 + (a^2*cos(d*x + c)^2 + a*b*cos(d*x + c)*sin(d*x + c))*log(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 + b^2) - (a^2*cos(d*x + c)^2 + a*b*cos(d*x + c)*sin(d*x + c))*log(cos(d*x + c)^2))/(a*b^3*d*cos(d*x + c)^2 + b^4*d*cos(d*x + c)*sin(d*x + c))
```

giac [A] time = 5.25, size = 71, normalized size = 1.16

$$-\frac{\frac{2\,a \log(|b \tan(dx+c)+a|)}{b^3} - \frac{\tan(dx+c)}{b^2} - \frac{2\,ab \tan(dx+c)+a^2-b^2}{(b \tan(dx+c)+a)b^3}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -(2*a*log(abs(b*tan(d*x + c) + a))/b^3 - tan(d*x + c)/b^2 - (2*a*b*tan(d*x + c) + a^2 - b^2)/((b*tan(d*x + c) + a)*b^3))/d
```

maple [A] time = 0.48, size = 78, normalized size = 1.28

$$\frac{\tan (dx+c)}{b^2 d} - \frac{2a \ln (a + b \tan (dx+c))}{b^3 d} - \frac{a^2}{d\, b^3 (a + b \tan (dx+c))} - \frac{1}{bd (a + b \tan (dx+c))}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4/(a+b*tan(d*x+c))^2,x)
```

```
[Out] tan(d*x+c)/b^2/d-2*a*ln(a+b*tan(d*x+c))/b^3/d-1/d/b^3/(a+b*tan(d*x+c))*a^2-1/b/d/(a+b*tan(d*x+c))
```

maxima [A] time = 0.33, size = 60, normalized size = 0.98

$$-\frac{\frac{a^2+b^2}{b^4 \tan(dx+c)+ab^3} + \frac{2\,a \log(b \tan(dx+c)+a)}{b^3} - \frac{\tan(dx+c)}{b^2}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -((a^2 + b^2)/(b^4*tan(d*x + c) + a*b^3) + 2*a*log(b*tan(d*x + c) + a)/b^3 - tan(d*x + c)/b^2)/d
```

mupad [B] time = 3.72, size = 67, normalized size = 1.10

$$\frac{\tan (c + d\,x)}{b^2\,d} - \frac{a^2 + b^2}{b\,d\,\left(\tan (c + d\,x)\,b^3 + a\,b^2\right)} - \frac{2\,a\,\ln (a + b \tan (c + d\,x))}{b^3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^4*(a + b*tan(c + d*x))^2),x)
```

```
[Out] tan(c + d*x)/(b^2*d) - (a^2 + b^2)/(b*d*(a*b^2 + b^3*tan(c + d*x))) - (2*a*
log(a + b*tan(c + d*x)))/(b^3*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^4(c+dx)}{(a+b\tan(c+dx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4/(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral(sec(c + d*x)**4/(a + b*tan(c + d*x))**2, x)
```

3.557 $\int \frac{\sec^2(c+dx)}{(a+b\tan(c+dx))^2}\,dx$

Optimal. Leaf size=20

$$-\frac{1}{bd(a+b\tan(c+dx))}$$

```
[Out] -1/b/d/(a+b*tan(d*x+c))
```

Rubi [A] time = 0.04, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {3506, 32}

$$-\frac{1}{bd(a+b\tan(c+dx))}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] -(1/(b*d*(a + b*Tan[c + d*x])))
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^2(c+dx)}{(a+b\tan(c+dx))^2}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{(a+x)^2}\,dx, x, b\tan(c+dx)\right)}{bd}\\ &= -\frac{1}{bd(a+b\tan(c+dx))}\end{aligned}$$

Mathematica [A] time = 0.05, size = 32, normalized size = 1.60

$$\frac{\sin(c+dx)}{ad(a\cos(c+dx)+b\sin(c+dx))}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] Sin[c + d*x]/(a*d*(a*Cos[c + d*x] + b*Sin[c + d*x]))
```

fricas [B] time = 0.72, size = 57, normalized size = 2.85

$$-\frac{b\cos(dx+c)-a\sin(dx+c)}{\left(a^3+ab^2\right)d\cos(dx+c)+\left(a^2b+b^3\right)d\sin(dx+c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -(b*cos(d*x + c) - a*sin(d*x + c))/((a^3 + a*b^2)*d*cos(d*x + c) + (a^2*b +
 b^3)*d*sin(d*x + c))
```

giac [A] time = 4.90, size = 20, normalized size = 1.00

$$-\frac{1}{(b\tan(dx+c)+a)bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -1/((b*tan(d*x + c) + a)*b*d)
```

maple [A] time = 0.33, size = 21, normalized size = 1.05

$$-\frac{1}{bd\,(a+b\tan(dx+c))}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2/(a+b*tan(d*x+c))^2,x)
```

```
[Out] -1/b/d/(a+b*tan(d*x+c))
```

maxima [A] time = 0.32, size = 20, normalized size = 1.00

$$-\frac{1}{(b\tan(dx+c)+a)bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/((b*tan(d*x + c) + a)*b*d)
```

mupad [B] time = 3.65, size = 20, normalized size = 1.00

$$-\frac{1}{b\,d\,\left(a+b\tan(c+d\,x)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^2*(a + b*tan(c + d*x))^2),x)
```

```
[Out] -1/(b*d*(a + b*tan(c + d*x)))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\sec^2(c+dx)}{(a+b\tan(c+dx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2/(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral(sec(c + d*x)**2/(a + b*tan(c + d*x))**2, x)
```

3.558 $\int \frac{\cos^2(c+dx)}{(a+b\tan(c+dx))^2}\,dx$

Optimal. Leaf size=152

$$\frac{b\left(a^2-3b^2\right)}{2d\left(a^2+b^2\right)^2(a+b\tan(c+dx))}+\frac{\cos^2(c+dx)(a\tan(c+dx)+b)}{2d\left(a^2+b^2\right)(a+b\tan(c+dx))}+\frac{4ab^3\log(a\cos(c+dx)+b\sin(c+dx))}{d\left(a^2+b^2\right)^3}+\frac{x}{}$$

```
[Out] 1/2*(a^4+6*a^2*b^2-3*b^4)*x/(a^2+b^2)^3+4*a*b^3*ln(a*cos(d*x+c)+b*sin(d*x+c
))/(a^2+b^2)^3/d+1/2*b*(a^2-3*b^2)/(a^2+b^2)^2/d/(a+b*tan(d*x+c))+1/2*cos(d
*x+c)^2*(b+a*tan(d*x+c))/(a^2+b^2)/d/(a+b*tan(d*x+c))
```

Rubi [A] time = 0.16, antiderivative size = 152, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {3506, 741, 801, 635, 203, 260}

$$\frac{b\left(a^2-3b^2\right)}{2d\left(a^2+b^2\right)^2(a+b\tan(c+dx))}+\frac{\cos^2(c+dx)(a\tan(c+dx)+b)}{2d\left(a^2+b^2\right)(a+b\tan(c+dx))}+\frac{4ab^3\log(a\cos(c+dx)+b\sin(c+dx))}{d\left(a^2+b^2\right)^3}+\frac{x}{}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] ((a^4 + 6*a^2*b^2 - 3*b^4)*x)/(2*(a^2 + b^2)^3) + (4*a*b^3*Log[a*Cos[c + d*
x] + b*Sin[c + d*x]])/((a^2 + b^2)^3*d) + (b*(a^2 - 3*b^2))/(2*(a^2 + b^2)^
2*d*(a + b*Tan[c + d*x])) + (Cos[c + d*x]^2*(b + a*Tan[c + d*x]))/(2*(a^2 +
 b^2)*d*(a + b*Tan[c + d*x]))
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 741

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(a*e + c*d*x)*(a + c*x^2)^(p + 1))/(2*a*(p + 1)*(c*d^2
+ a*e^2)), x] + Dist[1/(2*a*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*Simp[
c*d^2*(2*p + 3) + a*e^2*(m + 2*p + 3) + c*e*d*(m + 2*p + 4)*x, x]*(a + c*x^
2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] &&
 LtQ[p, -1] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 801

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_) + (c_.)*(x_)^2),
 x_Symbol] :> Int[ExpandIntegrand[((d + e*x)^m*(f + g*x))/(a + c*x^2), x],
x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] && IntegerQ[m]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^2(c+dx)}{(a+b\tan(c+dx))^2}\,dx = \frac{\text{Subst}\left(\int \frac{1}{(a+x)^2\left(1+\frac{x^2}{b^2}\right)^2}\,dx, x, b\tan(c+dx)\right)}{bd}$$

$$= \frac{\cos^2(c+dx)(b+a\tan(c+dx))}{2\left(a^2+b^2\right)d(a+b\tan(c+dx))} - \frac{b\,\text{Subst}\left(\int \frac{-3-\frac{a^2}{b^2}-\frac{2ax}{b^2}}{(a+x)^2\left(1+\frac{x^2}{b^2}\right)}\,dx, x, b\tan(c+dx)\right)}{2\left(a^2+b^2\right)d}$$

$$= \frac{\cos^2(c+dx)(b+a\tan(c+dx))}{2\left(a^2+b^2\right)d(a+b\tan(c+dx))} - \frac{b\,\text{Subst}\left(\int\left(\frac{a^2-3b^2}{\left(a^2+b^2\right)(a+x)^2} - \frac{8ab^2}{\left(a^2+b^2\right)^2(a+x)} + \frac{-a^4-6a^2b^2}{\left(a^2+b^2\right)}\right.\right.}{2\left(a^2+b^2\right)d}$$

$$= \frac{4ab^3\log(a+b\tan(c+dx))}{\left(a^2+b^2\right)^3 d} + \frac{b\left(a^2-3b^2\right)}{2\left(a^2+b^2\right)^2 d(a+b\tan(c+dx))} + \frac{\cos^2(c+dx)(b+a}{2\left(a^2+b^2\right)d(a+b}$$

$$= \frac{4ab^3\log(a+b\tan(c+dx))}{\left(a^2+b^2\right)^3 d} + \frac{b\left(a^2-3b^2\right)}{2\left(a^2+b^2\right)^2 d(a+b\tan(c+dx))} + \frac{\cos^2(c+dx)(b+a}{2\left(a^2+b^2\right)d(a+b}$$

$$= \frac{\left(a^4+6a^2b^2-3b^4\right)x}{2\left(a^2+b^2\right)^3} + \frac{4ab^3\log(\cos(c+dx))}{\left(a^2+b^2\right)^3 d} + \frac{4ab^3\log(a+b\tan(c+dx))}{\left(a^2+b^2\right)^3 d} + \frac{}{2\left(a^2\right.}$$

Mathematica [A] time = 3.94, size = 304, normalized size = 2.00

$$-\frac{ab\left(\left(\sqrt{-b^2}-a\right)\log\left(\sqrt{-b^2}-b\tan(c+dx)\right)-2\sqrt{-b^2}\log(a+b\tan(c+dx))+\left(a+\sqrt{-b^2}\right)\log\left(\sqrt{-b^2}+b\tan(c+dx)\right)\right)}{\sqrt{-b^2}\left(a^2+b^2\right)} + \frac{b\left(a^2-3b^2\right)\left(\frac{2\left(a^2+b^2\right)}{a+b\tan(c+dx)}+\left(\frac{b^2-a^2}{\sqrt{-b^2}}+2a\right.\right.}{2d\left(a^2+b^2\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (-((a*b*((-a + Sqrt[-b^2])*Log[Sqrt[-b^2] - b*Tan[c + d*x]] - 2*Sqrt[-b^2]*
Log[a + b*Tan[c + d*x]] + (a + Sqrt[-b^2])*Log[Sqrt[-b^2] + b*Tan[c + d*x]]
))/(Sqrt[-b^2]*(a^2 + b^2))) + (Cos[c + d*x]^2*(b + a*Tan[c + d*x]))/(a + b
*Tan[c + d*x]) + (b*(a^2 - 3*b^2)*((2*a + (-a^2 + b^2)/Sqrt[-b^2])*Log[Sqrt
[-b^2] - b*Tan[c + d*x]] - 4*a*Log[a + b*Tan[c + d*x]] + (2*a + (a^2 - b^2)
/Sqrt[-b^2])*Log[Sqrt[-b^2] + b*Tan[c + d*x]] + (2*(a^2 + b^2))/(a + b*Tan[
c + d*x]))/(2*(a^2 + b^2)^2))/(2*(a^2 + b^2)*d)
```

fricas [A] time = 0.57, size = 279, normalized size = 1.84

$$\frac{\left(a^4b+2a^2b^3+b^5\right)\cos(dx+c)^3-\left(a^2b^3+3b^5-\left(a^5+6a^3b^2-3ab^4\right)dx\right)\cos(dx+c)+4\left(a^2b^3\cos(dx+c)+ab\right.}{2\left(\left(a^7+3a^5b^2+\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/2*((a^4*b + 2*a^2*b^3 + b^5)*cos(d*x + c)^3 - (a^2*b^3 + 3*b^5 - (a^5 + 6
*a^3*b^2 - 3*a*b^4)*d*x)*cos(d*x + c) + 4*(a^2*b^3*cos(d*x + c) + a*b^4*sin
(d*x + c))*log(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2
 + b^2) - (a^3*b^2 - a*b^4 - (a^4*b + 6*a^2*b^3 - 3*b^5)*d*x - (a^5 + 2*a^3
*b^2 + a*b^4)*cos(d*x + c)^2)*sin(d*x + c))/((a^7 + 3*a^5*b^2 + 3*a^3*b^4 +
 a*b^6)*d*cos(d*x + c) + (a^6*b + 3*a^4*b^3 + 3*a^2*b^5 + b^7)*d*sin(d*x +
c))
```

giac [A] time = 1.27, size = 250, normalized size = 1.64

$$\frac{\frac{8\,ab^4\log(|b\tan(dx+c)+a|)}{a^6b+3\,a^4b^3+3\,a^2b^5+b^7}-\frac{4\,ab^3\log\left(\tan(dx+c)^2+1\right)}{a^6+3\,a^4b^2+3\,a^2b^4+b^6}+\frac{\left(a^4+6\,a^2b^2-3\,b^4\right)(dx+c)}{a^6+3\,a^4b^2+3\,a^2b^4+b^6}+\frac{a^2b\tan(dx+c)^2-3\,b^3\tan(dx+c)^2+a^3\tan(dx+c)+ab^2\tan(dx}{\left(a^4+2\,a^2b^2+b^4\right)\left(b\tan(dx+c)^3+a\tan(dx+c)^2+b\tan(}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/2*(8*a*b^4*log(abs(b*tan(d*x + c) + a))/(a^6*b + 3*a^4*b^3 + 3*a^2*b^5 +
b^7) - 4*a*b^3*log(tan(d*x + c)^2 + 1)/(a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6)
+ (a^4 + 6*a^2*b^2 - 3*b^4)*(d*x + c)/(a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6) +
 (a^2*b*tan(d*x + c)^2 - 3*b^3*tan(d*x + c)^2 + a^3*tan(d*x + c) + a*b^2*ta
n(d*x + c) + 2*a^2*b - 2*b^3)/((a^4 + 2*a^2*b^2 + b^4)*(b*tan(d*x + c)^3 +
a*tan(d*x + c)^2 + b*tan(d*x + c) + a)))/d
```

maple [A] time = 0.47, size = 292, normalized size = 1.92

$$-\frac{b^3}{d\left(a^2+b^2\right)^2\left(a+b\tan\left(dx+c\right)\right)}+\frac{4b^3a\ln\left(a+b\tan\left(dx+c\right)\right)}{d\left(a^2+b^2\right)^3}+\frac{\tan\left(dx+c\right)a^4}{2d\left(a^2+b^2\right)^3\left(1+\tan^2\left(dx+c\right)\right)}-\frac{\tan}{2d\left(a^2+b^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2/(a+b*tan(d*x+c))^2,x)
```

```
[Out] -1/d*b^3/(a^2+b^2)^2/(a+b*tan(d*x+c))+4/d*b^3/(a^2+b^2)^3*a*ln(a+b*tan(d*x+
c))+1/2/d/(a^2+b^2)^3/(1+tan(d*x+c)^2)*tan(d*x+c)*a^4-1/2/d/(a^2+b^2)^3/(1+
tan(d*x+c)^2)*tan(d*x+c)*b^4+1/d/(a^2+b^2)^3/(1+tan(d*x+c)^2)*a^3*b+1/d/(a^
2+b^2)^3/(1+tan(d*x+c)^2)*a*b^3-2/d/(a^2+b^2)^3*a*b^3*ln(1+tan(d*x+c)^2)+3/
d/(a^2+b^2)^3*arctan(tan(d*x+c))*a^2*b^2-3/2/d/(a^2+b^2)^3*arctan(tan(d*x+c
))*b^4+1/2/d/(a^2+b^2)^3*arctan(tan(d*x+c))*a^4
```

maxima [A] time = 0.44, size = 282, normalized size = 1.86

$$\frac{\frac{8\,ab^3\log(b\tan(dx+c)+a)}{a^6+3\,a^4b^2+3\,a^2b^4+b^6}-\frac{4\,ab^3\log\left(\tan(dx+c)^2+1\right)}{a^6+3\,a^4b^2+3\,a^2b^4+b^6}+\frac{\left(a^4+6\,a^2b^2-3\,b^4\right)(dx+c)}{a^6+3\,a^4b^2+3\,a^2b^4+b^6}+\frac{2\,a^2b-2\,b^3+\left(a^2b-3\,b^3\right)\tan(dx+c)^2+}{a^5+2\,a^3b^2+ab^4+\left(a^4b+2\,a^2b^3+b^5\right)\tan(dx+c)^3+\left(a^5+2\,a^3b^2+\right.}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/2*(8*a*b^3*log(b*tan(d*x + c) + a)/(a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6) -
4*a*b^3*log(tan(d*x + c)^2 + 1)/(a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6) + (a^4
+ 6*a^2*b^2 - 3*b^4)*(d*x + c)/(a^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6) + (2*a^2
*b - 2*b^3 + (a^2*b - 3*b^3)*tan(d*x + c)^2 + (a^3 + a*b^2)*tan(d*x + c))/(
a^5 + 2*a^3*b^2 + a*b^4 + (a^4*b + 2*a^2*b^3 + b^5)*tan(d*x + c)^3 + (a^5 +
 2*a^3*b^2 + a*b^4)*tan(d*x + c)^2 + (a^4*b + 2*a^2*b^3 + b^5)*tan(d*x + c)
))/d
```

mupad [B] time = 3.93, size = 246, normalized size = 1.62

$$\frac{\frac{a^2\,b-b^3}{{\left(a^2+b^2\right)}^2}+\frac{{\mathrm{tan}\left(c+d\,x\right)}^2\,\left(a^2\,b-3\,b^3\right)}{2\,\left(a^4+2\,a^2\,b^2+b^4\right)}+\frac{a\,\mathrm{tan}\left(c+d\,x\right)}{2\,\left(a^2+b^2\right)}}{d\,\left(b\,{\mathrm{tan}\left(c+d\,x\right)}^3+a\,{\mathrm{tan}\left(c+d\,x\right)}^2+b\,\mathrm{tan}\left(c+d\,x\right)+a\right)}+\frac{\ln\left(\mathrm{tan}\left(c+d\,x\right)-\mathrm{i}\right)\,\left(-3\,b+a\,1{}\mathrm{i}\right)}{4\,d\,\left(-a^3-a^2\,b\,3{}\mathrm{i}+3\,a\,b^2+b^3\,1{}\mathrm{i}\right)}+\frac{\ln\left(\mathrm{tan}\left(c+d\,x\right)\right.}{4\,d\,\left(-a^3\,1{}\mathrm{i}-3\,a^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2/(a + b*tan(c + d*x))^2,x)
```

```
[Out] ((a^2*b - b^3)/(a^2 + b^2)^2 + (tan(c + d*x)^2*(a^2*b - 3*b^3))/(2*(a^4 + b
^4 + 2*a^2*b^2)) + (a*tan(c + d*x))/(2*(a^2 + b^2)))/(d*(a + b*tan(c + d*x)
 + a*tan(c + d*x)^2 + b*tan(c + d*x)^3)) + (log(tan(c + d*x) - 1i)*(a*1i -
3*b))/(4*d*(3*a*b^2 - a^2*b*3i - a^3 + b^3*1i)) + (log(tan(c + d*x) + 1i)*(
a - b*3i))/(4*d*(a*b^2*3i - 3*a^2*b - a^3*1i + b^3)) + (4*a*b^3*log(a + b*t
an(c + d*x)))/(d*(a^2 + b^2)^3)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2/(a+b*tan(d*x+c))**2,x)
```

```
[Out] Timed out
```

3.559 $\int \frac{\cos^4(c+dx)}{(a+b\tan(c+dx))^2}\,dx$

Optimal. Leaf size=235

$$\frac{3b\left(a^2-b^2\right)\left(a^2+5b^2\right)}{8d\left(a^2+b^2\right)^3(a+b\tan(c+dx))}+\frac{\cos^4(c+dx)(a\tan(c+dx)+b)}{4d\left(a^2+b^2\right)(a+b\tan(c+dx))}-\frac{\cos^2(c+dx)\left(b\left(a^2-5b^2\right)-3a\left(a^2+3b^2\right)\right.}{8d\left(a^2+b^2\right)^2(a+b\tan(c+dx}$$

```
[Out] 3/8*(a^6+5*a^4*b^2+15*a^2*b^4-5*b^6)*x/(a^2+b^2)^4+6*a*b^5*ln(a*cos(d*x+c)+
b*sin(d*x+c))/(a^2+b^2)^4/d+3/8*b*(a^2-b^2)*(a^2+5*b^2)/(a^2+b^2)^3/d/(a+b*
tan(d*x+c))+1/4*cos(d*x+c)^4*(b+a*tan(d*x+c))/(a^2+b^2)/d/(a+b*tan(d*x+c))-
1/8*cos(d*x+c)^2*(b*(a^2-5*b^2)-3*a*(a^2+3*b^2)*tan(d*x+c))/(a^2+b^2)^2/d/(
a+b*tan(d*x+c))
```

Rubi [A] time = 0.27, antiderivative size = 235, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {3506, 741, 823, 801, 635, 203, 260}

$$\frac{3b\left(a^2-b^2\right)\left(a^2+5b^2\right)}{8d\left(a^2+b^2\right)^3(a+b\tan(c+dx))}-\frac{\cos^2(c+dx)\left(b\left(a^2-5b^2\right)-3a\left(a^2+3b^2\right)\tan(c+dx)\right)}{8d\left(a^2+b^2\right)^2(a+b\tan(c+dx))}+\frac{\cos^4(c+dx)(a\tan}{4d\left(a^2+b^2\right)(a+b}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (3*(a^6 + 5*a^4*b^2 + 15*a^2*b^4 - 5*b^6)*x)/(8*(a^2 + b^2)^4) + (6*a*b^5*L
og[a*Cos[c + d*x] + b*Sin[c + d*x]])/((a^2 + b^2)^4*d) + (3*b*(a^2 - b^2)*(
a^2 + 5*b^2))/(8*(a^2 + b^2)^3*d*(a + b*Tan[c + d*x])) + (Cos[c + d*x]^4*(b
 + a*Tan[c + d*x]))/(4*(a^2 + b^2)*d*(a + b*Tan[c + d*x])) - (Cos[c + d*x]^
2*(b*(a^2 - 5*b^2) - 3*a*(a^2 + 3*b^2)*Tan[c + d*x]))/(8*(a^2 + b^2)^2*d*(a
 + b*Tan[c + d*x]))
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 741

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(a*e + c*d*x)*(a + c*x^2)^(p + 1))/(2*a*(p + 1)*(c*d^2
+ a*e^2)), x] + Dist[1/(2*a*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*Simp[
c*d^2*(2*p + 3) + a*e^2*(m + 2*p + 3) + c*e*d*(m + 2*p + 4)*x, x]*(a + c*x^
2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] &&
 LtQ[p, -1] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 801

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_) + (c_.)*(x_)^2),
 x_Symbol] :> Int[ExpandIntegrand[((d + e*x)^m*(f + g*x))/(a + c*x^2), x],
x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] && IntegerQ[m]
```

Rule 823

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_), x_Symbol] :> -Simp[((d + e*x)^(m + 1)*(f*a*c*e - a*g*c*d + c*(c*d*f + a
*e*g)*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)*(c*d^2 + a*e^2)), x] + Dist[1/
(2*a*c*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*(a + c*x^2)^(p + 1)*Simp[f
*(c^2*d^2*(2*p + 3) + a*c*e^2*(m + 2*p + 3)) - a*c*d*e*g*m + c*e*(c*d*f + a
*e*g)*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*
d^2 + a*e^2, 0] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2
*m, 2*p])
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^4(c+dx)}{(a+b\tan(c+dx))^2}\,dx = \frac{\text{Subst}\left(\int \frac{1}{(a+x)^2\left(1+\frac{x^2}{b^2}\right)^3}\,dx, x, b\tan(c+dx)\right)}{bd}$$

$$= \frac{\cos^4(c+dx)(b+a\tan(c+dx))}{4\left(a^2+b^2\right)d(a+b\tan(c+dx))} - \frac{b\,\text{Subst}\left(\int \frac{-5-\frac{3a^2}{b^2}-\frac{4ax}{b^2}}{(a+x)^2\left(1+\frac{x^2}{b^2}\right)^2}\,dx, x, b\tan(c+dx)\right)}{4\left(a^2+b^2\right)d}$$

$$= \frac{\cos^4(c+dx)(b+a\tan(c+dx))}{4\left(a^2+b^2\right)d(a+b\tan(c+dx))} - \frac{\cos^2(c+dx)\left(b\left(a^2-5b^2\right)-3a\left(a^2+3b^2\right)\tan(c+\right.}{8\left(a^2+b^2\right)^2 d(a+b\tan(c+dx))}$$

$$= \frac{\cos^4(c+dx)(b+a\tan(c+dx))}{4\left(a^2+b^2\right)d(a+b\tan(c+dx))} - \frac{\cos^2(c+dx)\left(b\left(a^2-5b^2\right)-3a\left(a^2+3b^2\right)\tan(c+\right.}{8\left(a^2+b^2\right)^2 d(a+b\tan(c+dx))}$$

$$= \frac{6ab^5\log(a+b\tan(c+dx))}{\left(a^2+b^2\right)^4 d} + \frac{3b\left(a^2-b^2\right)\left(a^2+5b^2\right)}{8\left(a^2+b^2\right)^3 d(a+b\tan(c+dx))} + \frac{\cos^4(c+dx)(b+a}{4\left(a^2+b^2\right)d(a+b}$$

$$= \frac{6ab^5\log(a+b\tan(c+dx))}{\left(a^2+b^2\right)^4 d} + \frac{3b\left(a^2-b^2\right)\left(a^2+5b^2\right)}{8\left(a^2+b^2\right)^3 d(a+b\tan(c+dx))} + \frac{\cos^4(c+dx)(b+a}{4\left(a^2+b^2\right)d(a+b}$$

$$= \frac{3\left(a^6+5a^4b^2+15a^2b^4-5b^6\right)x}{8\left(a^2+b^2\right)^4} + \frac{6ab^5\log(\cos(c+dx))}{\left(a^2+b^2\right)^4 d} + \frac{6ab^5\log(a+b\tan(c+d}{\left(a^2+b^2\right)^4 d}$$

Mathematica [A] time = 3.33, size = 416, normalized size = 1.77

$$\frac{\frac{2b\cos^2(c+dx)\left(3a\left(a^2+3b^2\right)\tan(c+dx)-a^2b+5b^3\right)}{a^2+b^2}-\frac{\sqrt{-b^2}\left(6a\left(a^2+b^2\right)\left(a^2+3b^2\right)(a+b\tan(c+dx))\left(\left(a-\sqrt{-b^2}\right)\log\left(\sqrt{-b^2}-b\tan(c+dx)\right)+2\sqrt{-b^2}\log(\right.\right.}{}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (4*b*Cos[c + d*x]^4*(b + a*Tan[c + d*x]) + (2*b*Cos[c + d*x]^2*(-(a^2*b) +
5*b^3 + 3*a*(a^2 + 3*b^2)*Tan[c + d*x]))/(a^2 + b^2) - (Sqrt[-b^2]*(6*a*(a^
2 + b^2)*(a^2 + 3*b^2)*((a - Sqrt[-b^2])*Log[Sqrt[-b^2] - b*Tan[c + d*x]] +
 2*Sqrt[-b^2]*Log[a + b*Tan[c + d*x]] - (a + Sqrt[-b^2])*Log[Sqrt[-b^2] + b
*Tan[c + d*x]])*(a + b*Tan[c + d*x]) + 3*(a^4 + 4*a^2*b^2 - 5*b^4)*(2*Sqrt[
-b^2]*(a^2 + b^2) + (-a^2 + b^2 + 2*a*Sqrt[-b^2])*Log[Sqrt[-b^2] - b*Tan[c
+ d*x]]*(a + b*Tan[c + d*x]) - 4*a*Sqrt[-b^2]*Log[a + b*Tan[c + d*x]]*(a +
b*Tan[c + d*x]) + (a^2 - b^2 + 2*a*Sqrt[-b^2])*Log[Sqrt[-b^2] + b*Tan[c + d
*x]]*(a + b*Tan[c + d*x]))))/(a^2 + b^2)^3)/(16*b*(a^2 + b^2)*d*(a + b*Tan[
c + d*x]))
```

fricas [A] time = 0.68, size = 424, normalized size = 1.80

$$\frac{4\left(a^6b+3\,a^4b^3+3\,a^2b^5+b^7\right)\cos\left(dx+c\right)^5-2\left(a^6b-3\,a^4b^3-9\,a^2b^5-5\,b^7\right)\cos\left(dx+c\right)^3+\left(3\,a^6b+8\,a^4b^3-\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/16*(4*(a^6*b + 3*a^4*b^3 + 3*a^2*b^5 + b^7)*cos(d*x + c)^5 - 2*(a^6*b - 3
*a^4*b^3 - 9*a^2*b^5 - 5*b^7)*cos(d*x + c)^3 + (3*a^6*b + 8*a^4*b^3 - 9*a^2
*b^5 - 30*b^7 + 6*(a^7 + 5*a^5*b^2 + 15*a^3*b^4 - 5*a*b^6)*d*x)*cos(d*x + c
) + 48*(a^2*b^5*cos(d*x + c) + a*b^6*sin(d*x + c))*log(2*a*b*cos(d*x + c)*s
in(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 + b^2) - (3*a^5*b^2 + 22*a^3*b^4 +
 3*a*b^6 - 4*(a^7 + 3*a^5*b^2 + 3*a^3*b^4 + a*b^6)*cos(d*x + c)^4 - 6*(a^6*
b + 5*a^4*b^3 + 15*a^2*b^5 - 5*b^7)*d*x - 6*(a^7 + 5*a^5*b^2 + 7*a^3*b^4 +
3*a*b^6)*cos(d*x + c)^2)*sin(d*x + c))/((a^9 + 4*a^7*b^2 + 6*a^5*b^4 + 4*a^
3*b^6 + a*b^8)*d*cos(d*x + c) + (a^8*b + 4*a^6*b^3 + 6*a^4*b^5 + 4*a^2*b^7
+ b^9)*d*sin(d*x + c))
```

giac [B] time = 2.63, size = 464, normalized size = 1.97

$$\frac{\frac{48\,ab^6\log\left(|b\tan(dx+c)+a|\right)}{a^8b+4\,a^6b^3+6\,a^4b^5+4\,a^2b^7+b^9}-\frac{24\,ab^5\log\left(\tan(dx+c)^2+1\right)}{a^8+4\,a^6b^2+6\,a^4b^4+4\,a^2b^6+b^8}+\frac{3\left(a^6+5\,a^4b^2+15\,a^2b^4-5\,b^6\right)(dx+c)}{a^8+4\,a^6b^2+6\,a^4b^4+4\,a^2b^6+b^8}-\frac{8\left(6\,ab^6\tan(dx+c)+7\,a^2b^5+b^7\right)}{\left(a^8+4\,a^6b^2+6\,a^4b^4+4\,a^2b^6+b^8\right)(b\tan(d}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/8*(48*a*b^6*log(abs(b*tan(d*x + c) + a))/(a^8*b + 4*a^6*b^3 + 6*a^4*b^5 +
 4*a^2*b^7 + b^9) - 24*a*b^5*log(tan(d*x + c)^2 + 1)/(a^8 + 4*a^6*b^2 + 6*a
^4*b^4 + 4*a^2*b^6 + b^8) + 3*(a^6 + 5*a^4*b^2 + 15*a^2*b^4 - 5*b^6)*(d*x +
 c)/(a^8 + 4*a^6*b^2 + 6*a^4*b^4 + 4*a^2*b^6 + b^8) - 8*(6*a*b^6*tan(d*x +
c) + 7*a^2*b^5 + b^7)/((a^8 + 4*a^6*b^2 + 6*a^4*b^4 + 4*a^2*b^6 + b^8)*(b*t
an(d*x + c) + a)) + (36*a*b^5*tan(d*x + c)^4 + 3*a^6*tan(d*x + c)^3 + 15*a^
4*b^2*tan(d*x + c)^3 + 5*a^2*b^4*tan(d*x + c)^3 - 7*b^6*tan(d*x + c)^3 + 16
*a^3*b^3*tan(d*x + c)^2 + 88*a*b^5*tan(d*x + c)^2 + 5*a^6*tan(d*x + c) + 17
*a^4*b^2*tan(d*x + c) + 3*a^2*b^4*tan(d*x + c) - 9*b^6*tan(d*x + c) + 4*a^5
```

```
*b + 24*a^3*b^3 + 56*a*b^5)/((a^8 + 4*a^6*b^2 + 6*a^4*b^4 + 4*a^2*b^6 + b^8
)*(tan(d*x + c)^2 + 1)^2))/d
```

maple [B] time = 0.48, size = 661, normalized size = 2.81

$$-\frac{b^5}{d\left(a^2+b^2\right)^3\left(a+b\tan\left(dx+c\right)\right)}+\frac{6b^5a\ln\left(a+b\tan\left(dx+c\right)\right)}{d\left(a^2+b^2\right)^4}+\frac{3\left(\tan^3\left(dx+c\right)\right)a^6}{8d\left(a^2+b^2\right)^4\left(1+\tan^2\left(dx+c\right)\right)^2}+\frac{15\left(\tan^3\right.}{8d\left(a^2+b^2\right)^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4/(a+b*tan(d*x+c))^2,x)
```

```
[Out] -1/d*b^5/(a^2+b^2)^3/(a+b*tan(d*x+c))+6/d*b^5/(a^2+b^2)^4*a*ln(a+b*tan(d*x+
c))+3/8/d/(a^2+b^2)^4/(1+tan(d*x+c)^2)^2*tan(d*x+c)^3*a^6+15/8/d/(a^2+b^2)^
4/(1+tan(d*x+c)^2)^2*tan(d*x+c)^3*b^2*a^4+5/8/d/(a^2+b^2)^4/(1+tan(d*x+c)^2
)^2*tan(d*x+c)^3*b^4*a^2-7/8/d/(a^2+b^2)^4/(1+tan(d*x+c)^2)^2*tan(d*x+c)^3*
b^6+2/d/(a^2+b^2)^4/(1+tan(d*x+c)^2)^2*tan(d*x+c)^2*a^3*b^3+2/d/(a^2+b^2)^4
/(1+tan(d*x+c)^2)^2*tan(d*x+c)^2*a*b^5+17/8/d/(a^2+b^2)^4/(1+tan(d*x+c)^2)^
2*tan(d*x+c)*b^2*a^4+3/8/d/(a^2+b^2)^4/(1+tan(d*x+c)^2)^2*tan(d*x+c)*b^4*a^
2-9/8/d/(a^2+b^2)^4/(1+tan(d*x+c)^2)^2*tan(d*x+c)*b^6+5/8/d/(a^2+b^2)^4/(1+
tan(d*x+c)^2)^2*tan(d*x+c)*a^6+1/2/d/(a^2+b^2)^4/(1+tan(d*x+c)^2)^2*a^5*b+3
/d/(a^2+b^2)^4/(1+tan(d*x+c)^2)^2*a^3*b^3+5/2/d/(a^2+b^2)^4/(1+tan(d*x+c)^2
)^2*a*b^5-3/d/(a^2+b^2)^4*a*b^5*ln(1+tan(d*x+c)^2)+45/8/d/(a^2+b^2)^4*arcta
n(tan(d*x+c))*b^4*a^2-15/8/d/(a^2+b^2)^4*arctan(tan(d*x+c))*b^6+3/8/d/(a^2+
b^2)^4*arctan(tan(d*x+c))*a^6+15/8/d/(a^2+b^2)^4*arctan(tan(d*x+c))*b^2*a^4
```

maxima [B] time = 0.45, size = 502, normalized size = 2.14

$$\frac{\frac{48\,ab^5\log\left(b\tan\left(dx+c\right)+a\right)}{a^8+4\,a^6b^2+6\,a^4b^4+4\,a^2b^6+b^8}-\frac{24\,ab^5\log\left(\tan\left(dx+c\right)^2+1\right)}{a^8+4\,a^6b^2+6\,a^4b^4+4\,a^2b^6+b^8}+\frac{3\left(a^6+5\,a^4b^2+15\,a^2b^4-5\,b^6\right)\left(dx+c\right)}{a^8+4\,a^6b^2+6\,a^4b^4+4\,a^2b^6+b^8}+\frac{4\,a^4b+20\,a^2b^3-}{a^7+3\,a^5b^2+3\,a^3b^4+ab^6+\left(a^6b+3\,a^4b^3+3\,a^2b^5\right.}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] 1/8*(48*a*b^5*log(b*tan(d*x + c) + a)/(a^8 + 4*a^6*b^2 + 6*a^4*b^4 + 4*a^2*
b^6 + b^8) - 24*a*b^5*log(tan(d*x + c)^2 + 1)/(a^8 + 4*a^6*b^2 + 6*a^4*b^4
+ 4*a^2*b^6 + b^8) + 3*(a^6 + 5*a^4*b^2 + 15*a^2*b^4 - 5*b^6)*(d*x + c)/(a^
8 + 4*a^6*b^2 + 6*a^4*b^4 + 4*a^2*b^6 + b^8) + (4*a^4*b + 20*a^2*b^3 - 8*b^
5 + 3*(a^4*b + 4*a^2*b^3 - 5*b^5)*tan(d*x + c)^4 + 3*(a^5 + 4*a^3*b^2 + 3*a
*b^4)*tan(d*x + c)^3 + (5*a^4*b + 28*a^2*b^3 - 25*b^5)*tan(d*x + c)^2 + (5*
a^5 + 16*a^3*b^2 + 11*a*b^4)*tan(d*x + c))/(a^7 + 3*a^5*b^2 + 3*a^3*b^4 + a
*b^6 + (a^6*b + 3*a^4*b^3 + 3*a^2*b^5 + b^7)*tan(d*x + c)^5 + (a^7 + 3*a^5*
b^2 + 3*a^3*b^4 + a*b^6)*tan(d*x + c)^4 + 2*(a^6*b + 3*a^4*b^3 + 3*a^2*b^5
+ b^7)*tan(d*x + c)^3 + 2*(a^7 + 3*a^5*b^2 + 3*a^3*b^4 + a*b^6)*tan(d*x + c
)^2 + (a^6*b + 3*a^4*b^3 + 3*a^2*b^5 + b^7)*tan(d*x + c)))/d
```

mupad [B] time = 4.77, size = 463, normalized size = 1.97

$$\frac{\frac{3\tan\left(c+d\,x\right)^4\left(a^4\,b+4\,a^2\,b^3-5\,b^5\right)}{8\left(a^6+3\,a^4\,b^2+3\,a^2\,b^4+b^6\right)}+\frac{a^4\,b+5\,a^2\,b^3-2\,b^5}{2\left(a^2+b^2\right)\left(a^4+2\,a^2\,b^2+b^4\right)}+\frac{\tan\left(c+d\,x\right)\left(5\,a^3+11\,a\,b^2\right)}{8\left(a^4+2\,a^2\,b^2+b^4\right)}+\frac{3\tan\left(c+d\,x\right)^3\left(a^3+3\,a\,b^2\right)}{8\left(a^4+2\,a^2\,b^2+b^4\right)}+\frac{\tan\left(c+d\,x\right)^2\left(5\,a^4\,b+28\,a\right.}{8\left(a^2+b^2\right)\left(a^4+2\,a^2\right.}}{d\left(b\tan\left(c+d\,x\right)^5+a\tan\left(c+d\,x\right)^4+2\,b\tan\left(c+d\,x\right)^3+2\,a\tan\left(c+d\,x\right)^2+b\tan\left(c+d\,x\right)+a\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4/(a + b*tan(c + d*x))^2,x)
```

```
[Out] ((3*tan(c + d*x)^4*(a^4*b - 5*b^5 + 4*a^2*b^3))/(8*(a^6 + b^6 + 3*a^2*b^4 +
 3*a^4*b^2)) + (a^4*b - 2*b^5 + 5*a^2*b^3)/(2*(a^2 + b^2)*(a^4 + b^4 + 2*a^
```

```
2*b^2)) + (tan(c + d*x)*(11*a*b^2 + 5*a^3))/(8*(a^4 + b^4 + 2*a^2*b^2)) + (
3*tan(c + d*x)^3*(3*a*b^2 + a^3))/(8*(a^4 + b^4 + 2*a^2*b^2)) + (tan(c + d*
x)^2*(5*a^4*b - 25*b^5 + 28*a^2*b^3))/(8*(a^2 + b^2)*(a^4 + b^4 + 2*a^2*b^2
)))/(d*(a + b*tan(c + d*x) + 2*a*tan(c + d*x)^2 + a*tan(c + d*x)^4 + 2*b*ta
n(c + d*x)^3 + b*tan(c + d*x)^5)) + (3*log(tan(c + d*x) + 1i)*(a*b*4i - a^2
 + 5*b^2))/(16*d*(4*a^3*b - 4*a*b^3 + a^4*1i + b^4*1i - a^2*b^2*6i)) + (3*l
og(tan(c + d*x) - 1i)*(a*b*4i + a^2 - 5*b^2))/(16*d*(4*a*b^3 - 4*a^3*b + a^
4*1i + b^4*1i - a^2*b^2*6i)) + (6*a*b^5*log(a + b*tan(c + d*x)))/(d*(a^2 +
b^2)^4)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4/(a+b*tan(d*x+c))**2,x)
```

```
[Out] Timed out
```

3.560 $\int \frac{\sec^7(c+dx)}{(a+b\tan(c+dx))^2}\,dx$

Optimal. Leaf size=235

$$\frac{5a\left(a^2+b^2\right)^{3/2}\sec(c+dx)\tanh^{-1}\left(\frac{b-a\tan(c+dx)}{\sqrt{a^2+b^2}\sqrt{\sec^2(c+dx)}}\right)}{b^6d\sqrt{\sec^2(c+dx)}}-\frac{5\sec(c+dx)\left(8a\left(a^2+b^2\right)-b\left(4a^2+3b^2\right)\tan(c+dx)\right)}{8b^5d}+$$

```
[Out] 5/8*(8*a^4+12*a^2*b^2+3*b^4)*arcsinh(tan(d*x+c))*sec(d*x+c)/b^6/d/(sec(d*x+
c)^2)^(1/2)+5*a*(a^2+b^2)^(3/2)*arctanh((b-a*tan(d*x+c))/(a^2+b^2)^(1/2)/(s
ec(d*x+c)^2)^(1/2))*sec(d*x+c)/b^6/d/(sec(d*x+c)^2)^(1/2)-5/12*sec(d*x+c)^3
*(4*a-3*b*tan(d*x+c))/b^3/d-sec(d*x+c)^5/b/d/(a+b*tan(d*x+c))-5/8*sec(d*x+c
)*(8*a*(a^2+b^2)-b*(4*a^2+3*b^2)*tan(d*x+c))/b^5/d
```

Rubi [A] time = 0.27, antiderivative size = 235, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {3512, 733, 815, 844, 215, 725, 206}

$$-\frac{5\sec(c+dx)\left(8a\left(a^2+b^2\right)-b\left(4a^2+3b^2\right)\tan(c+dx)\right)}{8b^5d}+\frac{5a\left(a^2+b^2\right)^{3/2}\sec(c+dx)\tanh^{-1}\left(\frac{b-a\tan(c+dx)}{\sqrt{a^2+b^2}\sqrt{\sec^2(c+dx)}}\right)}{b^6d\sqrt{\sec^2(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^7/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (5*(8*a^4 + 12*a^2*b^2 + 3*b^4)*ArcSinh[Tan[c + d*x]]*Sec[c + d*x])/(8*b^6*
d*Sqrt[Sec[c + d*x]^2]) + (5*a*(a^2 + b^2)^(3/2)*ArcTanh[(b - a*Tan[c + d*x
])/(Sqrt[a^2 + b^2]*Sqrt[Sec[c + d*x]^2])]*Sec[c + d*x])/(b^6*d*Sqrt[Sec[c
+ d*x]^2]) - (5*Sec[c + d*x]^3*(4*a - 3*b*Tan[c + d*x]))/(12*b^3*d) - Sec[c
 + d*x]^5/(b*d*(a + b*Tan[c + d*x])) - (5*Sec[c + d*x]*(8*a*(a^2 + b^2) - b
*(4*a^2 + 3*b^2)*Tan[c + d*x]))/(8*b^5*d)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 725

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 733

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m + 1)*(a + c*x^2)^p)/(e*(m + 1)), x] - Dist[(2*c*p)/(e*(m + 1)
), Int[x*(d + e*x)^(m + 1)*(a + c*x^2)^(p - 1), x], x] /; FreeQ[{a, c, d, e
, m}, x] && NeQ[c*d^2 + a*e^2, 0] && GtQ[p, 0] && (IntegerQ[p] || LtQ[m, -1
]) && NeQ[m, -1] &&  !ILtQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e,
m, p, x]
```

Rule 815

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(c*e*f*(m + 2*p + 2) - g*c*d*(2*p
 + 1) + g*c*e*(m + 2*p + 1)*x)*(a + c*x^2)^p)/(c*e^2*(m + 2*p + 1)*(m + 2*p
 + 2)), x] + Dist[(2*p)/(c*e^2*(m + 2*p + 1)*(m + 2*p + 2)), Int[(d + e*x)^
m*(a + c*x^2)^(p - 1)*Simp[f*a*c*e^2*(m + 2*p + 2) + a*c*d*e*g*m - (c^2*f*d
*e*(m + 2*p + 2) - g*(c^2*d^2*(2*p + 1) + a*c*e^2*(m + 2*p + 1)))*x, x], x]
, x] /; FreeQ[{a, c, d, e, f, g, m}, x] && NeQ[c*d^2 + a*e^2, 0] && GtQ[p,
0] && (IntegerQ[p] ||  !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 0])) &&  !ILt
Q[m + 2*p, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\sec^7(c+dx)}{(a+b\tan(c+dx))^2}\,dx = \frac{\sec(c+dx)\,\text{Subst}\left(\int \frac{\left(1+\frac{x^2}{b^2}\right)^{5/2}}{(a+x)^2}\,dx, x, b\tan(c+dx)\right)}{bd\sqrt{\sec^2(c+dx)}}$$

$$= -\frac{\sec^5(c+dx)}{bd(a+b\tan(c+dx))} + \frac{(5\sec(c+dx))\,\text{Subst}\left(\int \frac{x\left(1+\frac{x^2}{b^2}\right)^{3/2}}{a+x}\,dx, x, b\tan(c+dx)\right)}{b^3d\sqrt{\sec^2(c+dx)}}$$

$$= -\frac{5\sec^3(c+dx)(4a-3b\tan(c+dx))}{12b^3d} - \frac{\sec^5(c+dx)}{bd(a+b\tan(c+dx))} + \frac{(5\sec(c+dx))\,\text{Subs}}{}$$

$$= -\frac{5\sec^3(c+dx)(4a-3b\tan(c+dx))}{12b^3d} - \frac{\sec^5(c+dx)}{bd(a+b\tan(c+dx))} - \frac{5\sec(c+dx)\left(8a\left(a^{2}\right.\right.}{}$$

$$= -\frac{5\sec^3(c+dx)(4a-3b\tan(c+dx))}{12b^3d} - \frac{\sec^5(c+dx)}{bd(a+b\tan(c+dx))} - \frac{5\sec(c+dx)\left(8a\left(a^{2}\right.\right.}{}$$

$$= \frac{5\left(8a^4+12a^2b^2+3b^4\right)\sinh^{-1}(\tan(c+dx))\sec(c+dx)}{8b^6d\sqrt{\sec^2(c+dx)}} - \frac{5\sec^3(c+dx)(4a-3b\tan}{12b^3d}$$

$$= \frac{5\left(8a^4+12a^2b^2+3b^4\right)\sinh^{-1}(\tan(c+dx))\sec(c+dx)}{8b^6d\sqrt{\sec^2(c+dx)}} + \frac{5a\left(a^2+b^2\right)^{3/2}\tanh^{-1}\left(\frac{}{\sqrt{}}\right.}{b^6d\sqrt{\sec}}$$

Mathematica [C] time = 6.23, size = 1152, normalized size = 4.90

$$\frac{10ia(a+ib)(ia+b)\sqrt{a^2+b^2}\,\tanh^{-1}\left(\frac{\sqrt{a^2+b^2}\left(a\sin\left(\frac{1}{2}(c+dx)\right)-b\cos\left(\frac{1}{2}(c+dx)\right)\right)}{\cos\left(\frac{1}{2}(c+dx)\right)a^2+b^2\cos\left(\frac{1}{2}(c+dx)\right)}\right)(a\cos(c+dx)+b\sin(c+dx))^2\sec^2(c+}{b^6d(a+b\tan(c+dx))^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^7/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] -(((a - I*b)^2*(a + I*b)^2*Sec[c + d*x]^2*(a*Cos[c + d*x] + b*Sin[c + d*x])
)/(b^5*d*(a + b*Tan[c + d*x])^2)) - (a*(12*a^2 + 13*b^2)*Sec[c + d*x]^2*(a*
Cos[c + d*x] + b*Sin[c + d*x])^2)/(3*b^5*d*(a + b*Tan[c + d*x])^2) + ((10*I
)*a*(a + I*b)*(I*a + b)*Sqrt[a^2 + b^2]*ArcTanh[(Sqrt[a^2 + b^2]*(-(b*Cos[(
c + d*x)/2]) + a*Sin[(c + d*x)/2]))/(a^2*Cos[(c + d*x)/2] + b^2*Cos[(c + d*
x)/2])]*Sec[c + d*x]^2*(a*Cos[c + d*x] + b*Sin[c + d*x])^2)/(b^6*d*(a + b*T
an[c + d*x])^2) - (5*(8*a^4 + 12*a^2*b^2 + 3*b^4)*Log[Cos[(c + d*x)/2] - Si
n[(c + d*x)/2]]*Sec[c + d*x]^2*(a*Cos[c + d*x] + b*Sin[c + d*x])^2)/(8*b^6*
d*(a + b*Tan[c + d*x])^2) + (5*(8*a^4 + 12*a^2*b^2 + 3*b^4)*Log[Cos[(c + d*
x)/2] + Sin[(c + d*x)/2]]*Sec[c + d*x]^2*(a*Cos[c + d*x] + b*Sin[c + d*x])^
```

```
2)/(8*b^6*d*(a + b*Tan[c + d*x])^2) + (Sec[c + d*x]^2*(a*Cos[c + d*x] + b*S
in[c + d*x])^2)/(16*b^2*d*(Cos[(c + d*x)/2] - Sin[(c + d*x)/2])^4*(a + b*Ta
n[c + d*x])^2) + ((36*a^2 - 8*a*b + 21*b^2)*Sec[c + d*x]^2*(a*Cos[c + d*x]
+ b*Sin[c + d*x])^2)/(48*b^4*d*(Cos[(c + d*x)/2] - Sin[(c + d*x)/2])^2*(a +
 b*Tan[c + d*x])^2) - (a*Sec[c + d*x]^2*Sin[(c + d*x)/2]*(a*Cos[c + d*x] +
b*Sin[c + d*x])^2)/(3*b^3*d*(Cos[(c + d*x)/2] - Sin[(c + d*x)/2])^3*(a + b*
Tan[c + d*x])^2) - (Sec[c + d*x]^2*(a*Cos[c + d*x] + b*Sin[c + d*x])^2)/(16
*b^2*d*(Cos[(c + d*x)/2] + Sin[(c + d*x)/2])^4*(a + b*Tan[c + d*x])^2) + (a
*Sec[c + d*x]^2*Sin[(c + d*x)/2]*(a*Cos[c + d*x] + b*Sin[c + d*x])^2)/(3*b^
3*d*(Cos[(c + d*x)/2] + Sin[(c + d*x)/2])^3*(a + b*Tan[c + d*x])^2) + ((-36
*a^2 - 8*a*b - 21*b^2)*Sec[c + d*x]^2*(a*Cos[c + d*x] + b*Sin[c + d*x])^2)/
(48*b^4*d*(Cos[(c + d*x)/2] + Sin[(c + d*x)/2])^2*(a + b*Tan[c + d*x])^2) +
 (Sec[c + d*x]^2*(-12*a^3*Sin[(c + d*x)/2] - 13*a*b^2*Sin[(c + d*x)/2])*(a*
Cos[c + d*x] + b*Sin[c + d*x])^2)/(3*b^5*d*(Cos[(c + d*x)/2] - Sin[(c + d*x
)/2])*(a + b*Tan[c + d*x])^2) + (Sec[c + d*x]^2*(12*a^3*Sin[(c + d*x)/2] +
13*a*b^2*Sin[(c + d*x)/2])*(a*Cos[c + d*x] + b*Sin[c + d*x])^2)/(3*b^5*d*(C
os[(c + d*x)/2] + Sin[(c + d*x)/2])*(a + b*Tan[c + d*x])^2)
```

fricas [B] time = 1.06, size = 472, normalized size = 2.01

$$\frac{12\,b^5 - 30\left(8\,a^4b + 12\,a^2b^3 + 3\,b^5\right)\cos\left(dx+c\right)^4 + 10\left(4\,a^2b^3 + 3\,b^5\right)\cos\left(dx+c\right)^2 + 120\left(\left(a^4 + a^2b^2\right)\cos\left(dx+\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/48*(12*b^5 - 30*(8*a^4*b + 12*a^2*b^3 + 3*b^5)*cos(d*x + c)^4 + 10*(4*a^2
*b^3 + 3*b^5)*cos(d*x + c)^2 + 120*((a^4 + a^2*b^2)*cos(d*x + c)^5 + (a^3*b
 + a*b^3)*cos(d*x + c)^4*sin(d*x + c))*sqrt(a^2 + b^2)*log((2*a*b*cos(d*x +
 c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 - 2*a^2 - b^2 - 2*sqrt(a^2 +
b^2)*(b*cos(d*x + c) - a*sin(d*x + c)))/(2*a*b*cos(d*x + c)*sin(d*x + c) +
(a^2 - b^2)*cos(d*x + c)^2 + b^2)) + 15*((8*a^5 + 12*a^3*b^2 + 3*a*b^4)*cos
(d*x + c)^5 + (8*a^4*b + 12*a^2*b^3 + 3*b^5)*cos(d*x + c)^4*sin(d*x + c))*l
og(sin(d*x + c) + 1) - 15*((8*a^5 + 12*a^3*b^2 + 3*a*b^4)*cos(d*x + c)^5 +
(8*a^4*b + 12*a^2*b^3 + 3*b^5)*cos(d*x + c)^4*sin(d*x + c))*log(-sin(d*x +
c) + 1) - 10*(2*a*b^4*cos(d*x + c) + 3*(4*a^3*b^2 + 5*a*b^4)*cos(d*x + c)^3
)*sin(d*x + c))/(a*b^6*d*cos(d*x + c)^5 + b^7*d*cos(d*x + c)^4*sin(d*x + c)
)
```

giac [B] time = 5.88, size = 530, normalized size = 2.26

$$\frac{15\left(8\,a^4+12\,a^2b^2+3\,b^4\right)\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)}{b^6} - \frac{15\left(8\,a^4+12\,a^2b^2+3\,b^4\right)\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)}{b^6} + \frac{120\left(a^5+2\,a^3b^2+ab^4\right)\log\left(\frac{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right.}{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)\right.}\right.}{\sqrt{a^2+b^2}\,b^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/24*(15*(8*a^4 + 12*a^2*b^2 + 3*b^4)*log(abs(tan(1/2*d*x + 1/2*c) + 1))/b^
6 - 15*(8*a^4 + 12*a^2*b^2 + 3*b^4)*log(abs(tan(1/2*d*x + 1/2*c) - 1))/b^6
+ 120*(a^5 + 2*a^3*b^2 + a*b^4)*log(abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b - 2*
sqrt(a^2 + b^2))/abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b + 2*sqrt(a^2 + b^2)))/(
sqrt(a^2 + b^2)*b^6) + 48*(a^4*b*tan(1/2*d*x + 1/2*c) + 2*a^2*b^3*tan(1/2*d
*x + 1/2*c) + b^5*tan(1/2*d*x + 1/2*c) + a^5 + 2*a^3*b^2 + a*b^4)/((a*tan(1
/2*d*x + 1/2*c)^2 - 2*b*tan(1/2*d*x + 1/2*c) - a)*a*b^5) + 2*(36*a^2*b*tan(
1/2*d*x + 1/2*c)^7 + 27*b^3*tan(1/2*d*x + 1/2*c)^7 + 96*a^3*tan(1/2*d*x + 1
```

```
/2*c)^6 + 144*a*b^2*tan(1/2*d*x + 1/2*c)^6 - 36*a^2*b*tan(1/2*d*x + 1/2*c)^
5 - 3*b^3*tan(1/2*d*x + 1/2*c)^5 - 288*a^3*tan(1/2*d*x + 1/2*c)^4 - 336*a*b
^2*tan(1/2*d*x + 1/2*c)^4 - 36*a^2*b*tan(1/2*d*x + 1/2*c)^3 - 3*b^3*tan(1/2
*d*x + 1/2*c)^3 + 288*a^3*tan(1/2*d*x + 1/2*c)^2 + 304*a*b^2*tan(1/2*d*x +
1/2*c)^2 + 36*a^2*b*tan(1/2*d*x + 1/2*c) + 27*b^3*tan(1/2*d*x + 1/2*c) - 96
*a^3 - 112*a*b^2)/((tan(1/2*d*x + 1/2*c)^2 - 1)^4*b^5))/d
```

maple [B] time = 0.48, size = 989, normalized size = 4.21

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^7/(a+b*tan(d*x+c))^2,x)
```

```
[Out] -5/d/b^3/(tan(1/2*d*x+1/2*c)+1)*a-4/d/b^5/(tan(1/2*d*x+1/2*c)+1)*a^3+2/d/(a
*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)/a*tan(1/2*d*x+1/2*c)+2/3/d/
b^3/(tan(1/2*d*x+1/2*c)-1)^3*a+3/2/d/b^4/(tan(1/2*d*x+1/2*c)-1)^2*a^2+1/d/b
^3/(tan(1/2*d*x+1/2*c)-1)^2*a-5/d/b^6*ln(tan(1/2*d*x+1/2*c)-1)*a^4-15/2/d/b
^4*ln(tan(1/2*d*x+1/2*c)-1)*a^2+4/d/b^5/(tan(1/2*d*x+1/2*c)-1)*a^3+3/2/d/b^
4/(tan(1/2*d*x+1/2*c)-1)*a^2+5/d/b^3/(tan(1/2*d*x+1/2*c)-1)*a-2/3/d/b^3/(ta
n(1/2*d*x+1/2*c)+1)^3*a-3/2/d/b^4/(tan(1/2*d*x+1/2*c)+1)^2*a^2+1/d/b^3/(tan
(1/2*d*x+1/2*c)+1)^2*a+4/d/b^3/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)
*b-a)*a^2+3/2/d/b^4/(tan(1/2*d*x+1/2*c)+1)*a^2+5/d/b^6*ln(tan(1/2*d*x+1/2*c
)+1)*a^4+15/2/d/b^4*ln(tan(1/2*d*x+1/2*c)+1)*a^2+2/d/b^5/(a*tan(1/2*d*x+1/2
*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)*a^4+2/d/b^4/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1
/2*d*x+1/2*c)*b-a)*a^3*tan(1/2*d*x+1/2*c)-11/8/d/b^2/(tan(1/2*d*x+1/2*c)+1)
^2+15/8/d/b^2*ln(tan(1/2*d*x+1/2*c)+1)+9/8/d/b^2/(tan(1/2*d*x+1/2*c)+1)+1/2
/d/b^2/(tan(1/2*d*x+1/2*c)-1)^3+11/8/d/b^2/(tan(1/2*d*x+1/2*c)-1)^2-15/8/d/
b^2*ln(tan(1/2*d*x+1/2*c)-1)+9/8/d/b^2/(tan(1/2*d*x+1/2*c)-1)-1/4/d/b^2/(ta
n(1/2*d*x+1/2*c)+1)^4+1/2/d/b^2/(tan(1/2*d*x+1/2*c)+1)^3+2/d/b/(a*tan(1/2*d
*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)+1/4/d/b^2/(tan(1/2*d*x+1/2*c)-1)^4+4/
d/b^2/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)*a*tan(1/2*d*x+1/2*c
)-10/d/b^6*a^5/(a^2+b^2)^(1/2)*arctanh(1/2*(2*a*tan(1/2*d*x+1/2*c)-2*b)/(a^
2+b^2)^(1/2))-20/d/b^4*a^3/(a^2+b^2)^(1/2)*arctanh(1/2*(2*a*tan(1/2*d*x+1/2
*c)-2*b)/(a^2+b^2)^(1/2))-10/d/b^2*a/(a^2+b^2)^(1/2)*arctanh(1/2*(2*a*tan(1
/2*d*x+1/2*c)-2*b)/(a^2+b^2)^(1/2))
```

maxima [B] time = 0.63, size = 827, normalized size = 3.52

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/24*(2*(120*a^5 + 160*a^3*b^2 + 24*a*b^4 + (180*a^4*b + 245*a^2*b^3 + 24*
b^5)*sin(d*x + c)/(cos(d*x + c) + 1) - 10*(48*a^5 + 68*a^3*b^2 + 15*a*b^4)*
sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 2*(300*a^4*b + 385*a^2*b^3 + 48*b^5)*
sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 10*(72*a^5 + 100*a^3*b^2 + 15*a*b^4)*
sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + 48*(15*a^4*b + 20*a^2*b^3 + 3*b^5)*si
n(d*x + c)^5/(cos(d*x + c) + 1)^5 - 30*(16*a^5 + 20*a^3*b^2 + 3*a*b^4)*sin(
d*x + c)^6/(cos(d*x + c) + 1)^6 - 6*(60*a^4*b + 85*a^2*b^3 + 16*b^5)*sin(d*
x + c)^7/(cos(d*x + c) + 1)^7 + 30*(4*a^5 + 4*a^3*b^2 - a*b^4)*sin(d*x + c)
^8/(cos(d*x + c) + 1)^8 + 3*(20*a^4*b + 25*a^2*b^3 + 8*b^5)*sin(d*x + c)^9/
(cos(d*x + c) + 1)^9)/(a^2*b^5 + 2*a*b^6*sin(d*x + c)/(cos(d*x + c) + 1) -
5*a^2*b^5*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 8*a*b^6*sin(d*x + c)^3/(cos
(d*x + c) + 1)^3 + 10*a^2*b^5*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + 12*a*b^
6*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 10*a^2*b^5*sin(d*x + c)^6/(cos(d*x
+ c) + 1)^6 - 8*a*b^6*sin(d*x + c)^7/(cos(d*x + c) + 1)^7 + 5*a^2*b^5*sin(d
*x + c)^8/(cos(d*x + c) + 1)^8 + 2*a*b^6*sin(d*x + c)^9/(cos(d*x + c) + 1)^
9 - a^2*b^5*sin(d*x + c)^10/(cos(d*x + c) + 1)^10) - 120*(a^4 + 2*a^2*b^2 +
```

```
b^4)*a*log((b - a*sin(d*x + c)/(cos(d*x + c) + 1) + sqrt(a^2 + b^2))/(b -
a*sin(d*x + c)/(cos(d*x + c) + 1) - sqrt(a^2 + b^2)))/(sqrt(a^2 + b^2)*b^6)
 - 15*(8*a^4 + 12*a^2*b^2 + 3*b^4)*log(sin(d*x + c)/(cos(d*x + c) + 1) + 1)
/b^6 + 15*(8*a^4 + 12*a^2*b^2 + 3*b^4)*log(sin(d*x + c)/(cos(d*x + c) + 1)
- 1)/b^6)/d
```

mupad [B] time = 6.54, size = 2654, normalized size = 11.29

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^7*(a + b*tan(c + d*x))^2),x)
```

```
[Out] -((9*a*b^5)/64 + (15*a^5*b)/8 + (b^6*sin(c + d*x))/8 + (115*a^3*b^3)/48 + (
3*b^6*sin(3*c + 3*d*x))/16 + (b^6*sin(5*c + 5*d*x))/16 + (a^6*cos(c + d*x)*
atan((sin(c/2 + (d*x)/2)*1i)/cos(c/2 + (d*x)/2))*25i)/4 + (5*a*b^5*cos(2*c
+ 2*d*x))/8 + (5*a^5*b*cos(2*c + 2*d*x))/2 + (5*a*b^5*cos(3*c + 3*d*x))/16
+ (25*a^5*b*cos(3*c + 3*d*x))/16 + (15*a*b^5*cos(4*c + 4*d*x))/64 + (5*a^5*
b*cos(4*c + 4*d*x))/8 + (a*b^5*cos(5*c + 5*d*x))/16 + (5*a^5*b*cos(5*c + 5*
d*x))/16 + (25*a^3*b^3*cos(c + d*x))/6 + (5*a^2*b^4*sin(c + d*x))/6 + (5*a^
4*b^2*sin(c + d*x))/8 + (a^6*atan((sin(c/2 + (d*x)/2)*1i)/cos(c/2 + (d*x)/2
))*cos(3*c + 3*d*x)*25i)/8 + (a^6*atan((sin(c/2 + (d*x)/2)*1i)/cos(c/2 + (d
*x)/2))*cos(5*c + 5*d*x)*5i)/8 + (10*a^3*b^3*cos(2*c + 2*d*x))/3 + (25*a^3*
b^3*cos(3*c + 3*d*x))/12 + (15*a^3*b^3*cos(4*c + 4*d*x))/16 + (5*a^3*b^3*co
s(5*c + 5*d*x))/12 + (95*a^2*b^4*sin(2*c + 2*d*x))/96 + (5*a^4*b^2*sin(2*c
+ 2*d*x))/8 + (5*a^2*b^4*sin(3*c + 3*d*x))/4 + (15*a^4*b^2*sin(3*c + 3*d*x)
)/16 + (25*a^2*b^4*sin(4*c + 4*d*x))/64 + (5*a^4*b^2*sin(4*c + 4*d*x))/16 +
 (5*a^2*b^4*sin(5*c + 5*d*x))/12 + (5*a^4*b^2*sin(5*c + 5*d*x))/16 + (5*a*b
^5*cos(c + d*x))/8 + (25*a^5*b*cos(c + d*x))/8 + (a*b^5*atan((sin(c/2 + (d*
x)/2)*1i)/cos(c/2 + (d*x)/2))*sin(3*c + 3*d*x)*45i)/64 + (a^5*b*atan((sin(c
/2 + (d*x)/2)*1i)/cos(c/2 + (d*x)/2))*sin(3*c + 3*d*x)*15i)/8 + (a*b^5*atan
((sin(c/2 + (d*x)/2)*1i)/cos(c/2 + (d*x)/2))*sin(5*c + 5*d*x)*15i)/64 + (a^
5*b*atan((sin(c/2 + (d*x)/2)*1i)/cos(c/2 + (d*x)/2))*sin(5*c + 5*d*x)*5i)/8
 + (a^3*b^3*sin(c + d*x)*atan((sin(c/2 + (d*x)/2)*1i)/cos(c/2 + (d*x)/2))*1
5i)/8 + (a^2*b^4*atan((sin(c/2 + (d*x)/2)*1i)/cos(c/2 + (d*x)/2))*cos(3*c +
 3*d*x)*75i)/64 + (a^4*b^2*atan((sin(c/2 + (d*x)/2)*1i)/cos(c/2 + (d*x)/2))
*cos(3*c + 3*d*x)*75i)/16 + (a^2*b^4*atan((sin(c/2 + (d*x)/2)*1i)/cos(c/2 +
 (d*x)/2))*cos(5*c + 5*d*x)*15i)/64 + (a^4*b^2*atan((sin(c/2 + (d*x)/2)*1i)
/cos(c/2 + (d*x)/2))*cos(5*c + 5*d*x)*15i)/16 + (a^3*b^3*atan((sin(c/2 + (d
*x)/2)*1i)/cos(c/2 + (d*x)/2))*sin(3*c + 3*d*x)*45i)/16 + (a^3*b^3*atan((si
n(c/2 + (d*x)/2)*1i)/cos(c/2 + (d*x)/2))*sin(5*c + 5*d*x)*15i)/16 + (25*a^3
*cos(c + d*x)*atanh((a^2*sin(c/2 + (d*x)/2)*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*
b^2)^(1/2) + 2*b^2*sin(c/2 + (d*x)/2)*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2)^(
1/2) + a*b*cos(c/2 + (d*x)/2)*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2)^(1/2))/(a
^5*cos(c/2 + (d*x)/2) + 2*b^5*sin(c/2 + (d*x)/2) + a*b^4*cos(c/2 + (d*x)/2)
 + 2*a^4*b*sin(c/2 + (d*x)/2) + 2*a^3*b^2*cos(c/2 + (d*x)/2) + 4*a^2*b^3*si
n(c/2 + (d*x)/2)))*((a^2 + b^2)^3)^(1/2))/4 + (a*b^5*sin(c + d*x)*atan((sin
(c/2 + (d*x)/2)*1i)/cos(c/2 + (d*x)/2))*15i)/32 + (a^5*b*sin(c + d*x)*atan(
(sin(c/2 + (d*x)/2)*1i)/cos(c/2 + (d*x)/2))*5i)/4 + (25*a^3*atanh((a^2*sin(
c/2 + (d*x)/2)*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2)^(1/2) + 2*b^2*sin(c/2 +
(d*x)/2)*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2)^(1/2) + a*b*cos(c/2 + (d*x)/2)
*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2)^(1/2))/(a^5*cos(c/2 + (d*x)/2) + 2*b^5
*sin(c/2 + (d*x)/2) + a*b^4*cos(c/2 + (d*x)/2) + 2*a^4*b*sin(c/2 + (d*x)/2)
 + 2*a^3*b^2*cos(c/2 + (d*x)/2) + 4*a^2*b^3*sin(c/2 + (d*x)/2)))*cos(3*c +
3*d*x)*((a^2 + b^2)^3)^(1/2))/8 + (5*a^3*atanh((a^2*sin(c/2 + (d*x)/2)*(a^6
 + b^6 + 3*a^2*b^4 + 3*a^4*b^2)^(1/2) + 2*b^2*sin(c/2 + (d*x)/2)*(a^6 + b^6
 + 3*a^2*b^4 + 3*a^4*b^2)^(1/2) + a*b*cos(c/2 + (d*x)/2)*(a^6 + b^6 + 3*a^2
*b^4 + 3*a^4*b^2)^(1/2))/(a^5*cos(c/2 + (d*x)/2) + 2*b^5*sin(c/2 + (d*x)/2)
 + a*b^4*cos(c/2 + (d*x)/2) + 2*a^4*b*sin(c/2 + (d*x)/2) + 2*a^3*b^2*cos(c/
2 + (d*x)/2) + 4*a^2*b^3*sin(c/2 + (d*x)/2)))*cos(5*c + 5*d*x)*((a^2 + b^2)
```

```
^3)^(1/2))/8 + (a^2*b^4*cos(c + d*x)*atan((sin(c/2 + (d*x)/2)*1i)/cos(c/2 +
 (d*x)/2))*75i)/32 + (a^4*b^2*cos(c + d*x)*atan((sin(c/2 + (d*x)/2)*1i)/cos
(c/2 + (d*x)/2))*75i)/8 + (15*a^2*b*atanh((a^2*sin(c/2 + (d*x)/2)*(a^6 + b^
6 + 3*a^2*b^4 + 3*a^4*b^2)^(1/2) + 2*b^2*sin(c/2 + (d*x)/2)*(a^6 + b^6 + 3*
a^2*b^4 + 3*a^4*b^2)^(1/2) + a*b*cos(c/2 + (d*x)/2)*(a^6 + b^6 + 3*a^2*b^4
+ 3*a^4*b^2)^(1/2))/(a^5*cos(c/2 + (d*x)/2) + 2*b^5*sin(c/2 + (d*x)/2) + a*
b^4*cos(c/2 + (d*x)/2) + 2*a^4*b*sin(c/2 + (d*x)/2) + 2*a^3*b^2*cos(c/2 + (
d*x)/2) + 4*a^2*b^3*sin(c/2 + (d*x)/2)))*sin(3*c + 3*d*x)*((a^2 + b^2)^3)^(
1/2))/8 + (5*a^2*b*atanh((a^2*sin(c/2 + (d*x)/2)*(a^6 + b^6 + 3*a^2*b^4 + 3
*a^4*b^2)^(1/2) + 2*b^2*sin(c/2 + (d*x)/2)*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b
^2)^(1/2) + a*b*cos(c/2 + (d*x)/2)*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2)^(1/2
))/(a^5*cos(c/2 + (d*x)/2) + 2*b^5*sin(c/2 + (d*x)/2) + a*b^4*cos(c/2 + (d*
x)/2) + 2*a^4*b*sin(c/2 + (d*x)/2) + 2*a^3*b^2*cos(c/2 + (d*x)/2) + 4*a^2*b
^3*sin(c/2 + (d*x)/2)))*sin(5*c + 5*d*x)*((a^2 + b^2)^3)^(1/2))/8 + (5*a^2*
b*atanh((a^2*sin(c/2 + (d*x)/2)*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2)^(1/2) +
 2*b^2*sin(c/2 + (d*x)/2)*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2)^(1/2) + a*b*c
os(c/2 + (d*x)/2)*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2)^(1/2))/(a^5*cos(c/2 +
 (d*x)/2) + 2*b^5*sin(c/2 + (d*x)/2) + a*b^4*cos(c/2 + (d*x)/2) + 2*a^4*b*s
in(c/2 + (d*x)/2) + 2*a^3*b^2*cos(c/2 + (d*x)/2) + 4*a^2*b^3*sin(c/2 + (d*x
)/2)))*sin(c + d*x)*((a^2 + b^2)^3)^(1/2))/4)/(a*b^6*d*((5*a*cos(c + d*x))/
8 + (b*sin(c + d*x))/8 + (5*a*cos(3*c + 3*d*x))/16 + (a*cos(5*c + 5*d*x))/1
6 + (3*b*sin(3*c + 3*d*x))/16 + (b*sin(5*c + 5*d*x))/16))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^7(c+dx)}{(a+b\tan(c+dx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**7/(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral(sec(c + d*x)**7/(a + b*tan(c + d*x))**2, x)
```

3.561 $\int \frac{\sec^5(c+dx)}{(a+b\tan(c+dx))^2}\,dx$

Optimal. Leaf size=176

$$\frac{3a\sqrt{a^2+b^2}\,\sec(c+dx)\tanh^{-1}\left(\frac{b-a\tan(c+dx)}{\sqrt{a^2+b^2}\,\sqrt{\sec^2(c+dx)}}\right)}{b^4d\sqrt{\sec^2(c+dx)}}+\frac{3\left(2a^2+b^2\right)\sec(c+dx)\sinh^{-1}(\tan(c+dx))}{2b^4d\sqrt{\sec^2(c+dx)}}-\frac{3\sec(c+d}{}$$

```
[Out] 3/2*(2*a^2+b^2)*arcsinh(tan(d*x+c))*sec(d*x+c)/b^4/d/(sec(d*x+c)^2)^(1/2)+3
*a*arctanh((b-a*tan(d*x+c))/(a^2+b^2)^(1/2)/(sec(d*x+c)^2)^(1/2))*sec(d*x+c
)*(a^2+b^2)^(1/2)/b^4/d/(sec(d*x+c)^2)^(1/2)-3/2*sec(d*x+c)*(2*a-b*tan(d*x+
c))/b^3/d-sec(d*x+c)^3/b/d/(a+b*tan(d*x+c))
```

Rubi [A] time = 0.17, antiderivative size = 176, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {3512, 733, 815, 844, 215, 725, 206}

$$\frac{3a\sqrt{a^2+b^2}\,\sec(c+dx)\tanh^{-1}\left(\frac{b-a\tan(c+dx)}{\sqrt{a^2+b^2}\,\sqrt{\sec^2(c+dx)}}\right)}{b^4d\sqrt{\sec^2(c+dx)}}+\frac{3\left(2a^2+b^2\right)\sec(c+dx)\sinh^{-1}(\tan(c+dx))}{2b^4d\sqrt{\sec^2(c+dx)}}-\frac{3\sec(c+d}{}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^5/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (3*(2*a^2 + b^2)*ArcSinh[Tan[c + d*x]]*Sec[c + d*x])/(2*b^4*d*Sqrt[Sec[c +
d*x]^2]) + (3*a*Sqrt[a^2 + b^2]*ArcTanh[(b - a*Tan[c + d*x])/(Sqrt[a^2 + b^
2]*Sqrt[Sec[c + d*x]^2])]*Sec[c + d*x])/(b^4*d*Sqrt[Sec[c + d*x]^2]) - (3*S
ec[c + d*x]*(2*a - b*Tan[c + d*x]))/(2*b^3*d) - Sec[c + d*x]^3/(b*d*(a + b*
Tan[c + d*x]))
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 725

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 733

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m + 1)*(a + c*x^2)^p)/(e*(m + 1)), x] - Dist[(2*c*p)/(e*(m + 1)
), Int[x*(d + e*x)^(m + 1)*(a + c*x^2)^(p - 1), x], x] /; FreeQ[{a, c, d, e
, m}, x] && NeQ[c*d^2 + a*e^2, 0] && GtQ[p, 0] && (IntegerQ[p] || LtQ[m, -1
]) && NeQ[m, -1] &&  !ILtQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e,
m, p, x]
```

Rule 815

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(c*e*f*(m + 2*p + 2) - g*c*d*(2*p
 + 1) + g*c*e*(m + 2*p + 1)*x)*(a + c*x^2)^p)/(c*e^2*(m + 2*p + 1)*(m + 2*p
 + 2)), x] + Dist[(2*p)/(c*e^2*(m + 2*p + 1)*(m + 2*p + 2)), Int[(d + e*x)^
m*(a + c*x^2)^(p - 1)*Simp[f*a*c*e^2*(m + 2*p + 2) + a*c*d*e*g*m - (c^2*f*d
*e*(m + 2*p + 2) - g*(c^2*d^2*(2*p + 1) + a*c*e^2*(m + 2*p + 1)))*x, x], x]
, x] /; FreeQ[{a, c, d, e, f, g, m}, x] && NeQ[c*d^2 + a*e^2, 0] && GtQ[p,
0] && (IntegerQ[p] ||  !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 0])) &&  !ILt
Q[m + 2*p, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\sec^5(c+dx)}{(a+b\tan(c+dx))^2}\,dx = \frac{\sec(c+dx)\,\text{Subst}\left(\int \frac{\left(1+\frac{x^2}{b^2}\right)^{3/2}}{(a+x)^2}\,dx, x, b\tan(c+dx)\right)}{bd\sqrt{\sec^2(c+dx)}}$$

$$= -\frac{\sec^3(c+dx)}{bd(a+b\tan(c+dx))} + \frac{(3\sec(c+dx))\,\text{Subst}\left(\int \frac{x\sqrt{1+\frac{x^2}{b^2}}}{a+x}\,dx, x, b\tan(c+dx)\right)}{b^3d\sqrt{\sec^2(c+dx)}}$$

$$= -\frac{3\sec(c+dx)(2a-b\tan(c+dx))}{2b^3d} - \frac{\sec^3(c+dx)}{bd(a+b\tan(c+dx))} + \frac{(3\sec(c+dx))\,\text{Subst}}{2b}$$

$$= -\frac{3\sec(c+dx)(2a-b\tan(c+dx))}{2b^3d} - \frac{\sec^3(c+dx)}{bd(a+b\tan(c+dx))} - \frac{\left(3a\left(a^2+b^2\right)\sec(c+\right.}{}$$

$$= \frac{3\left(2a^2+b^2\right)\sinh^{-1}(\tan(c+dx))\sec(c+dx)}{2b^4d\sqrt{\sec^2(c+dx)}} - \frac{3\sec(c+dx)(2a-b\tan(c+dx))}{2b^3d} -$$

$$= \frac{3\left(2a^2+b^2\right)\sinh^{-1}(\tan(c+dx))\sec(c+dx)}{2b^4d\sqrt{\sec^2(c+dx)}} + \frac{3a\sqrt{a^2+b^2}\,\tanh^{-1}\left(\frac{b\left(1-\frac{a\tan(c+dx)}{b}\right)}{\sqrt{a^2+b^2}\sqrt{\sec^2(c+d}}\right.}{b^4d\sqrt{\sec^2(c+dx)}}$$

Mathematica [C] time = 6.13, size = 709, normalized size = 4.03

$$-\frac{3\left(2a^2+b^2\right)\sec^2(c+dx)\log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right)(a\cos(c+dx)+b\sin(c+dx))^2}{2b^4d(a+b\tan(c+dx))^2}+\frac{3\left(2a^2+b\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^5/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] -(((a - I*b)*(a + I*b)*Sec[c + d*x]^2*(a*Cos[c + d*x] + b*Sin[c + d*x]))/(b
^3*d*(a + b*Tan[c + d*x])^2)) - (2*a*Sec[c + d*x]^2*(a*Cos[c + d*x] + b*Sin
[c + d*x])^2)/(b^3*d*(a + b*Tan[c + d*x])^2) - (6*a*Sqrt[a^2 + b^2]*ArcTanh
[(Sqrt[a^2 + b^2]*(-(b*Cos[(c + d*x)/2]) + a*Sin[(c + d*x)/2]))/(a^2*Cos[(c
 + d*x)/2] + b^2*Cos[(c + d*x)/2])]*Sec[c + d*x]^2*(a*Cos[c + d*x] + b*Sin[
c + d*x])^2)/(b^4*d*(a + b*Tan[c + d*x])^2) - (3*(2*a^2 + b^2)*Log[Cos[(c +
 d*x)/2] - Sin[(c + d*x)/2]]*Sec[c + d*x]^2*(a*Cos[c + d*x] + b*Sin[c + d*x
])^2)/(2*b^4*d*(a + b*Tan[c + d*x])^2) + (3*(2*a^2 + b^2)*Log[Cos[(c + d*x)
/2] + Sin[(c + d*x)/2]]*Sec[c + d*x]^2*(a*Cos[c + d*x] + b*Sin[c + d*x])^2)
/(2*b^4*d*(a + b*Tan[c + d*x])^2) + (Sec[c + d*x]^2*(a*Cos[c + d*x] + b*Sin
[c + d*x])^2)/(4*b^2*d*(Cos[(c + d*x)/2] - Sin[(c + d*x)/2])^2*(a + b*Tan[c
 + d*x])^2) - (2*a*Sec[c + d*x]^2*Sin[(c + d*x)/2]*(a*Cos[c + d*x] + b*Sin[
c + d*x])^2)/(b^3*d*(Cos[(c + d*x)/2] - Sin[(c + d*x)/2])*(a + b*Tan[c + d*
x])^2) - (Sec[c + d*x]^2*(a*Cos[c + d*x] + b*Sin[c + d*x])^2)/(4*b^2*d*(Cos
[(c + d*x)/2] + Sin[(c + d*x)/2])^2*(a + b*Tan[c + d*x])^2) + (2*a*Sec[c +
d*x]^2*Sin[(c + d*x)/2]*(a*Cos[c + d*x] + b*Sin[c + d*x])^2)/(b^3*d*(Cos[(c
 + d*x)/2] + Sin[(c + d*x)/2])*(a + b*Tan[c + d*x])^2)
```

fricas [B] time = 1.04, size = 355, normalized size = 2.02

$$-\frac{6\,ab^2\cos(dx+c)\sin(dx+c)-2\,b^3+6\left(2\,a^2b+b^3\right)\cos(dx+c)^2-6\left(a^2\cos(dx+c)^3+ab\cos(dx+c)^2\sin\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -1/4*(6*a*b^2*cos(d*x + c)*sin(d*x + c) - 2*b^3 + 6*(2*a^2*b + b^3)*cos(d*x
 + c)^2 - 6*(a^2*cos(d*x + c)^3 + a*b*cos(d*x + c)^2*sin(d*x + c))*sqrt(a^2
 + b^2)*log((2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 -
 2*a^2 - b^2 - 2*sqrt(a^2 + b^2)*(b*cos(d*x + c) - a*sin(d*x + c)))/(2*a*b*
cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 + b^2)) - 3*((2*a^3
+ a*b^2)*cos(d*x + c)^3 + (2*a^2*b + b^3)*cos(d*x + c)^2*sin(d*x + c))*log(
sin(d*x + c) + 1) + 3*((2*a^3 + a*b^2)*cos(d*x + c)^3 + (2*a^2*b + b^3)*cos
(d*x + c)^2*sin(d*x + c))*log(-sin(d*x + c) + 1))/(a*b^4*d*cos(d*x + c)^3 +
 b^5*d*cos(d*x + c)^2*sin(d*x + c))
```

giac [A] time = 2.93, size = 280, normalized size = 1.59

$$\frac{\frac{3\left(2\,a^2+b^2\right)\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)}{b^4}-\frac{3\left(2\,a^2+b^2\right)\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)}{b^4}+\frac{6\left(a^3+ab^2\right)\log\left(\frac{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2\,b-2\,\sqrt{a^2+b^2}\right|}{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2\,b+2\,\sqrt{a^2+b^2}\right|}\right)}{\sqrt{a^2+b^2}\,b^4}+\frac{2\left(b\tan\left(\frac{1}{2}\,dx\right.\right.}{}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] 1/2*(3*(2*a^2 + b^2)*log(abs(tan(1/2*d*x + 1/2*c) + 1))/b^4 - 3*(2*a^2 + b^
2)*log(abs(tan(1/2*d*x + 1/2*c) - 1))/b^4 + 6*(a^3 + a*b^2)*log(abs(2*a*tan
(1/2*d*x + 1/2*c) - 2*b - 2*sqrt(a^2 + b^2))/abs(2*a*tan(1/2*d*x + 1/2*c) -
 2*b + 2*sqrt(a^2 + b^2)))/(sqrt(a^2 + b^2)*b^4) + 2*(b*tan(1/2*d*x + 1/2*c
)^3 + 4*a*tan(1/2*d*x + 1/2*c)^2 + b*tan(1/2*d*x + 1/2*c) - 4*a)/((tan(1/2*
d*x + 1/2*c)^2 - 1)^2*b^3) + 4*(a^2*b*tan(1/2*d*x + 1/2*c) + b^3*tan(1/2*d*
x + 1/2*c) + a^3 + a*b^2)/((a*tan(1/2*d*x + 1/2*c)^2 - 2*b*tan(1/2*d*x + 1/
2*c) - a)*a*b^3))/d
```

maple [B] time = 0.45, size = 440, normalized size = 2.50

$$\frac{2a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d\,b^2\left(a\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)b-a\right)}+\frac{2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d\left(a\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)b-a\right)a}+\frac{\cdots}{d\,b^3\left(a\left(\tan^2\left(\frac{dx}{2}\cdots\right.\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^5/(a+b*tan(d*x+c))^2,x)
```

```
[Out] 2/d/b^2/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)*a*tan(1/2*d*x+1/2
*c)+2/d/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)/a*tan(1/2*d*x+1/2
*c)+2/d/b^3/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)*a^2+2/d/b/(a*
tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)-6/d/b^4*(a^2+b^2)^(1/2)*a*ar
ctanh(1/2*(2*a*tan(1/2*d*x+1/2*c)-2*b)/(a^2+b^2)^(1/2))+1/2/d/b^2/(tan(1/2*
d*x+1/2*c)-1)^2+2/d/b^3/(tan(1/2*d*x+1/2*c)-1)*a+1/2/d/b^2/(tan(1/2*d*x+1/2
*c)-1)-3/d/b^4*ln(tan(1/2*d*x+1/2*c)-1)*a^2-3/2/d/b^2*ln(tan(1/2*d*x+1/2*c)
-1)-1/2/d/b^2/(tan(1/2*d*x+1/2*c)+1)^2-2/d/b^3/(tan(1/2*d*x+1/2*c)+1)*a+1/2
/d/b^2/(tan(1/2*d*x+1/2*c)+1)+3/d/b^4*ln(tan(1/2*d*x+1/2*c)+1)*a^2+3/2/d/b^
2*ln(tan(1/2*d*x+1/2*c)+1)
```

maxima [B] time = 0.48, size = 471, normalized size = 2.68

$$-\frac{\frac{2\left(6a^3+2ab^2+\frac{6a^3\sin(dx+c)^4}{(\cos(dx+c)+1)^4}+\frac{(9a^2b+2b^3)\sin(dx+c)}{\cos(dx+c)+1}-\frac{6(2a^3+ab^2)\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-\frac{4(3a^2b+b^3)\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{(3a^2b+2b^3)\sin(dx+c)^5}{(\cos(dx+c)+1)^5}\right)}{a^2b^3+\frac{2ab^4\sin(dx+c)}{\cos(dx+c)+1}-\frac{3a^2b^3\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-\frac{4ab^4\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{3a^2b^3\sin(dx+c)^4}{(\cos(dx+c)+1)^4}+\frac{2ab^4\sin(dx+c)^5}{(\cos(dx+c)+1)^5}-\frac{a^2b^3\sin(dx+c)^6}{(\cos(dx+c)+1)^6}}-\frac{6\sqrt{a^2+b^2}\,a\log\left(\frac{b-\frac{a\sin(dx\cdots}{\cos(dx+c\cdots}}{b-\frac{a\sin(dx\cdots}{\cos(dx+c\cdots}}\right)}{b^4}\cdots}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/2*(2*(6*a^3 + 2*a*b^2 + 6*a^3*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + (9*a
^2*b + 2*b^3)*sin(d*x + c)/(cos(d*x + c) + 1) - 6*(2*a^3 + a*b^2)*sin(d*x +
 c)^2/(cos(d*x + c) + 1)^2 - 4*(3*a^2*b + b^3)*sin(d*x + c)^3/(cos(d*x + c)
 + 1)^3 + (3*a^2*b + 2*b^3)*sin(d*x + c)^5/(cos(d*x + c) + 1)^5)/(a^2*b^3 +
 2*a*b^4*sin(d*x + c)/(cos(d*x + c) + 1) - 3*a^2*b^3*sin(d*x + c)^2/(cos(d*
x + c) + 1)^2 - 4*a*b^4*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 3*a^2*b^3*sin
(d*x + c)^4/(cos(d*x + c) + 1)^4 + 2*a*b^4*sin(d*x + c)^5/(cos(d*x + c) + 1
)^5 - a^2*b^3*sin(d*x + c)^6/(cos(d*x + c) + 1)^6) - 6*sqrt(a^2 + b^2)*a*lo
g((b - a*sin(d*x + c)/(cos(d*x + c) + 1) + sqrt(a^2 + b^2))/(b - a*sin(d*x
+ c)/(cos(d*x + c) + 1) - sqrt(a^2 + b^2)))/b^4 - 3*(2*a^2 + b^2)*log(sin(d
*x + c)/(cos(d*x + c) + 1) + 1)/b^4 + 3*(2*a^2 + b^2)*log(sin(d*x + c)/(cos
(d*x + c) + 1) - 1)/b^4)/d
```

mupad [B] time = 5.01, size = 585, normalized size = 3.32

$$\frac{\operatorname{atanh}\left(\frac{648\,a^3\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{216\,a\,b^2+648\,a^3+\frac{432\,a^5}{b^2}}+\frac{432\,a^5\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{432\,a^5+648\,a^3\,b^2+216\,a\,b^4}+\frac{216\,a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{216\,a+\frac{648\,a^3}{b^2}+\frac{432\,a^5}{b^4}}\right)\left(6\,a^2+3\,b^2\right)}{b^4\,d}-\frac{\frac{2\left(3\,a^2+b^2\right)}{b^3}+\frac{6\,a^2\tan\left(\frac{c}{2}\right.}{b^3}}{d\left(-a\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^6+2\,b\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^5*(a + b*tan(c + d*x))^2),x)
```

```
[Out] (atanh((648*a^3*tan(c/2 + (d*x)/2))/(216*a*b^2 + 648*a^3 + (432*a^5)/b^2) +
 (432*a^5*tan(c/2 + (d*x)/2))/(216*a*b^4 + 432*a^5 + 648*a^3*b^2) + (216*a*
tan(c/2 + (d*x)/2))/(216*a + (648*a^3)/b^2 + (432*a^5)/b^4))*(6*a^2 + 3*b^2
))/(b^4*d) - ((2*(3*a^2 + b^2))/b^3 + (6*a^2*tan(c/2 + (d*x)/2)^4)/b^3 - (6
*tan(c/2 + (d*x)/2)^2*(2*a^2 + b^2))/b^3 + (tan(c/2 + (d*x)/2)*(9*a^2 + 2*b
^2))/(a*b^2) - (4*tan(c/2 + (d*x)/2)^3*(3*a^2 + b^2))/(a*b^2) + (tan(c/2 +
(d*x)/2)^5*(3*a^2 + 2*b^2))/(a*b^2))/(d*(a + 2*b*tan(c/2 + (d*x)/2) - 3*a*t
an(c/2 + (d*x)/2)^2 + 3*a*tan(c/2 + (d*x)/2)^4 - a*tan(c/2 + (d*x)/2)^6 - 4
*b*tan(c/2 + (d*x)/2)^3 + 2*b*tan(c/2 + (d*x)/2)^5)) - (6*a*atanh((432*a^3*
(a^2 + b^2)^(1/2))/(432*a^3*b + (432*a^5)/b + 864*a^4*tan(c/2 + (d*x)/2) +
864*a^2*b^2*tan(c/2 + (d*x)/2)) + (864*a^2*tan(c/2 + (d*x)/2)*(a^2 + b^2)^(
1/2))/(432*a^3 + (432*a^5)/b^2 + 864*a^2*b*tan(c/2 + (d*x)/2) + (864*a^4*ta
n(c/2 + (d*x)/2))/b) + (432*a^4*tan(c/2 + (d*x)/2)*(a^2 + b^2)^(1/2))/(432*
a^5 + 432*a^3*b^2 + 864*a^4*b*tan(c/2 + (d*x)/2) + 864*a^2*b^3*tan(c/2 + (d
*x)/2)))*(a^2 + b^2)^(1/2))/(b^4*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^5(c+dx)}{(a+b\tan(c+dx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**5/(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral(sec(c + d*x)**5/(a + b*tan(c + d*x))**2, x)
```

3.562 $\int \frac{\sec^3(c+dx)}{(a+b\tan(c+dx))^2}\,dx$

Optimal. Leaf size=91

$$\frac{a\tanh^{-1}\left(\frac{b\cos(c+dx)-a\sin(c+dx)}{\sqrt{a^2+b^2}}\right)}{b^2d\sqrt{a^2+b^2}}-\frac{\sec(c+dx)}{bd(a+b\tan(c+dx))}+\frac{\tanh^{-1}(\sin(c+dx))}{b^2d}$$

```
[Out] arctanh(sin(d*x+c))/b^2/d+a*arctanh((b*cos(d*x+c)-a*sin(d*x+c))/(a^2+b^2)^(
1/2))/b^2/d/(a^2+b^2)^(1/2)-sec(d*x+c)/b/d/(a+b*tan(d*x+c))
```

Rubi [A] time = 0.11, antiderivative size = 132, normalized size of antiderivative = 1.45, number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {3512, 733, 844, 215, 725, 206}

$$\frac{a\sec(c+dx)\tanh^{-1}\left(\frac{b-a\tan(c+dx)}{\sqrt{a^2+b^2}\sqrt{\sec^2(c+dx)}}\right)}{b^2d\sqrt{a^2+b^2}\sqrt{\sec^2(c+dx)}}-\frac{\sec(c+dx)}{bd(a+b\tan(c+dx))}+\frac{\sec(c+dx)\sinh^{-1}(\tan(c+dx))}{b^2d\sqrt{\sec^2(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (ArcSinh[Tan[c + d*x]]*Sec[c + d*x])/(b^2*d*Sqrt[Sec[c + d*x]^2]) + (a*ArcT
anh[(b - a*Tan[c + d*x])/(Sqrt[a^2 + b^2]*Sqrt[Sec[c + d*x]^2])]*Sec[c + d*
x])/(b^2*Sqrt[a^2 + b^2]*d*Sqrt[Sec[c + d*x]^2]) - Sec[c + d*x]/(b*d*(a + b
*Tan[c + d*x]))
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 725

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 733

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m + 1)*(a + c*x^2)^p)/(e*(m + 1)), x] - Dist[(2*c*p)/(e*(m + 1)
), Int[x*(d + e*x)^(m + 1)*(a + c*x^2)^(p - 1), x], x] /; FreeQ[{a, c, d, e
, m}, x] && NeQ[c*d^2 + a*e^2, 0] && GtQ[p, 0] && (IntegerQ[p] || LtQ[m, -1
]) && NeQ[m, -1] &&  !ILtQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e,
m, p, x]
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
```

```
e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && !IGtQ[m, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] && !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\sec^3(c+dx)}{(a+b\tan(c+dx))^2}\,dx = \frac{\sec(c+dx)\,\text{Subst}\left(\int \frac{\sqrt{1+\frac{x^2}{b^2}}}{(a+x)^2}\,dx, x, b\tan(c+dx)\right)}{bd\sqrt{\sec^2(c+dx)}}$$

$$= -\frac{\sec(c+dx)}{bd(a+b\tan(c+dx))} + \frac{\sec(c+dx)\,\text{Subst}\left(\int \frac{x}{(a+x)\sqrt{1+\frac{x^2}{b^2}}}\,dx, x, b\tan(c+dx)\right)}{b^3d\sqrt{\sec^2(c+dx)}}$$

$$= -\frac{\sec(c+dx)}{bd(a+b\tan(c+dx))} + \frac{\sec(c+dx)\,\text{Subst}\left(\int \frac{1}{\sqrt{1+\frac{x^2}{b^2}}}\,dx, x, b\tan(c+dx)\right)}{b^3d\sqrt{\sec^2(c+dx)}} - \frac{(a\,\text{s}}{}$$

$$= \frac{\sinh^{-1}(\tan(c+dx))\sec(c+dx)}{b^2d\sqrt{\sec^2(c+dx)}} - \frac{\sec(c+dx)}{bd(a+b\tan(c+dx))} + \frac{(a\sec(c+dx))\,\text{Subst}}{b^3d\sqrt{}}$$

$$= \frac{\sinh^{-1}(\tan(c+dx))\sec(c+dx)}{b^2d\sqrt{\sec^2(c+dx)}} + \frac{a\tanh^{-1}\left(\frac{b\left(1-\frac{a\tan(c+dx)}{b}\right)}{\sqrt{a^2+b^2}\sqrt{\sec^2(c+dx)}}\right)\sec(c+dx)}{b^2\sqrt{a^2+b^2}\,d\sqrt{\sec^2(c+dx)}} - \frac{}{bd}$$

Mathematica [A] time = 0.81, size = 120, normalized size = 1.32

$$-\frac{\frac{2a\tanh^{-1}\left(\frac{a\tan\left(\frac{1}{2}(c+dx)\right)-b}{\sqrt{a^2+b^2}}\right)}{\sqrt{a^2+b^2}} + \frac{b\sec(c+dx)}{a+b\tan(c+dx)} + \log\left(\cos\left(\frac{1}{2}(c+dx)\right)-\sin\left(\frac{1}{2}(c+dx)\right)\right) - \log\left(\sin\left(\frac{1}{2}(c+dx)\right)+\cos\left(\right.\right.}{b^2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^3/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] -(((2*a*ArcTanh[(-b + a*Tan[(c + d*x)/2])/Sqrt[a^2 + b^2]])/Sqrt[a^2 + b^2]
 + Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]] - Log[Cos[(c + d*x)/2] + Sin[(c
 + d*x)/2]] + (b*Sec[c + d*x])/(a + b*Tan[c + d*x]))/(b^2*d))
```

fricas [B] time = 0.58, size = 293, normalized size = 3.22

$$-\frac{2a^2b + 2b^3 - \left(a^2\cos(dx+c) + ab\sin(dx+c)\right)\sqrt{a^2+b^2}\,\log\left(\frac{2ab\cos(dx+c)\sin(dx+c)+\left(a^2-b^2\right)\cos(dx+c)^2-2a^2-b^2-2\sqrt{}}{2ab\cos(dx+c)\sin(dx+c)+\left(a^2-b^2\right)\cos(}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -1/2*(2*a^2*b + 2*b^3 - (a^2*cos(d*x + c) + a*b*sin(d*x + c))*sqrt(a^2 + b^
2)*log((2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 - 2*a^
2 - b^2 - 2*sqrt(a^2 + b^2)*(b*cos(d*x + c) - a*sin(d*x + c)))/(2*a*b*cos(d
*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 + b^2)) - ((a^3 + a*b^2)*
cos(d*x + c) + (a^2*b + b^3)*sin(d*x + c))*log(sin(d*x + c) + 1) + ((a^3 +
a*b^2)*cos(d*x + c) + (a^2*b + b^3)*sin(d*x + c))*log(-sin(d*x + c) + 1))/(
(a^3*b^2 + a*b^4)*d*cos(d*x + c) + (a^2*b^3 + b^5)*d*sin(d*x + c))
```

giac [A] time = 1.93, size = 166, normalized size = 1.82

$$\frac{\frac{a\log\left(\frac{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2\,b-2\,\sqrt{a^2+b^2}\right|}{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2\,b+2\,\sqrt{a^2+b^2}\right|}\right)}{\sqrt{a^2+b^2}\,b^2}+\frac{\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)}{b^2}-\frac{\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)}{b^2}+\frac{2\left(b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+a\right)}{\left(a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-2\,b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-a\right)ab}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] (a*log(abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b - 2*sqrt(a^2 + b^2))/abs(2*a*tan(
1/2*d*x + 1/2*c) - 2*b + 2*sqrt(a^2 + b^2)))/(sqrt(a^2 + b^2)*b^2) + log(ab
s(tan(1/2*d*x + 1/2*c) + 1))/b^2 - log(abs(tan(1/2*d*x + 1/2*c) - 1))/b^2 +
 2*(b*tan(1/2*d*x + 1/2*c) + a)/((a*tan(1/2*d*x + 1/2*c)^2 - 2*b*tan(1/2*d*
x + 1/2*c) - a)*a*b))/d
```

maple [A] time = 0.47, size = 174, normalized size = 1.91

$$\frac{2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{d\left(a\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)b-a\right)a}+\frac{2}{db\left(a\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)b-a\right)}-\frac{2a\operatorname{arctanh}\left(\frac{2a\tan(\ldots}{2\sqrt{a\ldots}}\right.}{d\,b^2\sqrt{a^2+b\ldots}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3/(a+b*tan(d*x+c))^2,x)
```

```
[Out] 2/d/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)/a*tan(1/2*d*x+1/2*c)+
2/d/b/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)-2/d/b^2*a/(a^2+b^2)
^(1/2)*arctanh(1/2*(2*a*tan(1/2*d*x+1/2*c)-2*b)/(a^2+b^2)^(1/2))-1/d/b^2*ln
(tan(1/2*d*x+1/2*c)-1)+1/d/b^2*ln(tan(1/2*d*x+1/2*c)+1)
```

maxima [B] time = 0.45, size = 212, normalized size = 2.33

$$-\frac{\frac{2\left(a+\frac{b\sin(dx+c)}{\cos(dx+c)+1}\right)}{a^2b+\frac{2\,ab^2\sin(dx+c)}{\cos(dx+c)+1}-\frac{a^2b\sin(dx+c)^2}{(\cos(dx+c)+1)^2}}-\frac{a\log\left(\frac{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}+\sqrt{a^2+b^2}}{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}-\sqrt{a^2+b^2}}\right)}{\sqrt{a^2+b^2}\,b^2}-\frac{\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}+1\right)}{b^2}+\frac{\log\left(\frac{\sin(dx+c)}{\cos(dx+c)+1}-1\right)}{b^2}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -(2*(a + b*sin(d*x + c)/(cos(d*x + c) + 1))/(a^2*b + 2*a*b^2*sin(d*x + c)/(
cos(d*x + c) + 1) - a^2*b*sin(d*x + c)^2/(cos(d*x + c) + 1)^2) - a*log((b -
 a*sin(d*x + c)/(cos(d*x + c) + 1) + sqrt(a^2 + b^2))/(b - a*sin(d*x + c)/(
cos(d*x + c) + 1) - sqrt(a^2 + b^2)))/(sqrt(a^2 + b^2)*b^2) - log(sin(d*x +
```

```
c)/(cos(d*x + c) + 1) + 1)/b^2 + log(sin(d*x + c)/(cos(d*x + c) + 1) - 1)/
b^2)/d
```

mupad [B] time = 4.19, size = 383, normalized size = 4.21

$$-\frac{b^2\sin(c+d\,x)-\frac{2\left(a^2\cos(c+d\,x)\,\mathrm{atanh}\left(\frac{\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)}{\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)}\right)\sqrt{a^2+b^2}+a^3\,\mathrm{atan}\left(\frac{1\mathrm{i}\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)a^2+1\mathrm{i}\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)a\,b+2\mathrm{i}\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)b^2}{a\cos\left(\frac{c}{2}+\frac{d\,x}{2}\right)\sqrt{a^2+b^2}+2\,b\sin\left(\frac{c}{2}+\frac{d\,x}{2}\right)\sqrt{a^2+b^2}}\right)\cos(c+d\,x)\,1\mathrm{i}\right)}{\sqrt{a^2+b^2}}\cdots}{a\,b^2\,d\,\left(a\cos(c\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^3*(a + b*tan(c + d*x))^2),x)
```

```
[Out] -(b^2*sin(c + d*x) - (2*(a^3*atan((a^2*sin(c/2 + (d*x)/2)*1i + b^2*sin(c/2
+ (d*x)/2)*2i + a*b*cos(c/2 + (d*x)/2)*1i)/(a*cos(c/2 + (d*x)/2)*(a^2 + b^2
)^(1/2) + 2*b*sin(c/2 + (d*x)/2)*(a^2 + b^2)^(1/2)))*cos(c + d*x)*1i + a^2*
cos(c + d*x)*atanh(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2))*(a^2 + b^2)^(1/2)
))/(a^2 + b^2)^(1/2) + (2*b*((a*(a^2 + b^2)^(1/2))/2 + (a*cos(c + d*x)*(a^2
 + b^2)^(1/2))/2 - a^2*atan((a^2*sin(c/2 + (d*x)/2)*1i + b^2*sin(c/2 + (d*x
)/2)*2i + a*b*cos(c/2 + (d*x)/2)*1i)/(a*cos(c/2 + (d*x)/2)*(a^2 + b^2)^(1/2
) + 2*b*sin(c/2 + (d*x)/2)*(a^2 + b^2)^(1/2)))*sin(c + d*x)*1i - a*sin(c +
d*x)*atanh(sin(c/2 + (d*x)/2)/cos(c/2 + (d*x)/2))*(a^2 + b^2)^(1/2)))/(a^2
+ b^2)^(1/2))/(a*b^2*d*(a*cos(c + d*x) + b*sin(c + d*x)))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^3(c+dx)}{(a+b\tan(c+dx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3/(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral(sec(c + d*x)**3/(a + b*tan(c + d*x))**2, x)
```

3.563 $\int \frac{\sec(c+dx)}{(a+b\tan(c+dx))^2}\,dx$

Optimal. Leaf size=82

$$-\frac{b\sec(c+dx)}{d\left(a^2+b^2\right)(a+b\tan(c+dx))}-\frac{a\tanh^{-1}\left(\frac{b\cos(c+dx)-a\sin(c+dx)}{\sqrt{a^2+b^2}}\right)}{d\left(a^2+b^2\right)^{3/2}}$$

```
[Out] -a*arctanh((b*cos(d*x+c)-a*sin(d*x+c))/(a^2+b^2)^(1/2))/(a^2+b^2)^(3/2)/d-b
*sec(d*x+c)/(a^2+b^2)/d/(a+b*tan(d*x+c))
```

Rubi [A] time = 0.07, antiderivative size = 105, normalized size of antiderivative = 1.28, number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {3512, 731, 725, 206}

$$-\frac{b\sec(c+dx)}{d\left(a^2+b^2\right)(a+b\tan(c+dx))}-\frac{a\sec(c+dx)\tanh^{-1}\left(\frac{b-a\tan(c+dx)}{\sqrt{a^2+b^2}\sqrt{\sec^2(c+dx)}}\right)}{d\left(a^2+b^2\right)^{3/2}\sqrt{\sec^2(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] -((a*ArcTanh[(b - a*Tan[c + d*x])/(Sqrt[a^2 + b^2]*Sqrt[Sec[c + d*x]^2])]*S
ec[c + d*x])/((a^2 + b^2)^(3/2)*d*Sqrt[Sec[c + d*x]^2])) - (b*Sec[c + d*x])
/((a^2 + b^2)*d*(a + b*Tan[c + d*x]))
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 725

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 731

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/((m + 1)*(c*d^2 + a*e^2)), x] + D
ist[(c*d)/(c*d^2 + a*e^2), Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; F
reeQ[{a, c, d, e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[m + 2*p + 3, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] && !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\sec(c+dx)}{(a+b\tan(c+dx))^2}\,dx = \frac{\sec(c+dx)\,\mathrm{Subst}\left(\int \frac{1}{(a+x)^2\sqrt{1+\frac{x^2}{b^2}}}\,dx, x, b\tan(c+dx)\right)}{bd\sqrt{\sec^2(c+dx)}}$$

$$= -\frac{b\sec(c+dx)}{(a^2+b^2)\,d(a+b\tan(c+dx))} + \frac{(a\sec(c+dx))\,\mathrm{Subst}\left(\int \frac{1}{(a+x)\sqrt{1+\frac{x^2}{b^2}}}\,dx, x, b\tan\right.}{b(a^2+b^2)\,d\sqrt{\sec^2(c+dx)}}$$

$$= -\frac{b\sec(c+dx)}{(a^2+b^2)\,d(a+b\tan(c+dx))} - \frac{(a\sec(c+dx))\,\mathrm{Subst}\left(\int \frac{1}{1+\frac{a^2}{b^2}-x^2}\,dx, x, \frac{1-\frac{a\tan(c+}{b}}{\sqrt{\sec^2(c+}}\right.}{b(a^2+b^2)\,d\sqrt{\sec^2(c+dx)}}$$

$$= -\frac{a\tanh^{-1}\left(\frac{b\left(1-\frac{a\tan(c+dx)}{b}\right)}{\sqrt{a^2+b^2}\sqrt{\sec^2(c+dx)}}\right)\sec(c+dx)}{(a^2+b^2)^{3/2}\,d\sqrt{\sec^2(c+dx)}} - \frac{b\sec(c+dx)}{(a^2+b^2)\,d(a+b\tan(c+dx))}$$

Mathematica [A] time = 0.38, size = 78, normalized size = 0.95

$$\frac{\frac{2a\tanh^{-1}\left(\frac{a\tan\left(\frac{1}{2}(c+dx)\right)-b}{\sqrt{a^2+b^2}}\right)}{(a^2+b^2)^{3/2}} - \frac{b\sec(c+dx)}{(a^2+b^2)(a+b\tan(c+dx))}}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] ((2*a*ArcTanh[(-b + a*Tan[(c + d*x)/2])/Sqrt[a^2 + b^2]])/(a^2 + b^2)^(3/2)
 - (b*Sec[c + d*x])/((a^2 + b^2)*(a + b*Tan[c + d*x])))/d
```

fricas [B] time = 0.67, size = 215, normalized size = 2.62

$$-\frac{2a^2b + 2b^3 - \left(a^2\cos(dx+c) + ab\sin(dx+c)\right)\sqrt{a^2+b^2}\,\log\left(-\frac{2ab\cos(dx+c)\sin(dx+c)+(a^2-b^2)\cos(dx+c)^2-2a^2-b^2+2}{2ab\cos(dx+c)\sin(dx+c)+(a^2-b^2)\cos}\right.}{2\left((a^5+2a^3b^2+ab^4)d\cos(dx+c) + (a^4b+2a^2b^3+b^5)d\sin(dx+c)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] -1/2*(2*a^2*b + 2*b^3 - (a^2*cos(d*x + c) + a*b*sin(d*x + c))*sqrt(a^2 + b^
2)*log(-(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 - 2*a
^2 - b^2 + 2*sqrt(a^2 + b^2)*(b*cos(d*x + c) - a*sin(d*x + c)))/(2*a*b*cos(
d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 + b^2)))/((a^5 + 2*a^3*b
^2 + a*b^4)*d*cos(d*x + c) + (a^4*b + 2*a^2*b^3 + b^5)*d*sin(d*x + c))
```

giac [A] time = 2.94, size = 138, normalized size = 1.68

$$-\frac{\frac{a\log\left(\frac{\left|2a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-2b-2\sqrt{a^2+b^2}\right|}{\left|2a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-2b+2\sqrt{a^2+b^2}\right|}\right)}{(a^2+b^2)^{\frac{3}{2}}} - \frac{2\left(b^2\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)+ab\right)}{(a^3+ab^2)\left(a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-2b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-a\right)}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -(a*log(abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b - 2*sqrt(a^2 + b^2))/abs(2*a*tan
(1/2*d*x + 1/2*c) - 2*b + 2*sqrt(a^2 + b^2)))/(a^2 + b^2)^(3/2) - 2*(b^2*ta
n(1/2*d*x + 1/2*c) + a*b)/((a^3 + a*b^2)*(a*tan(1/2*d*x + 1/2*c)^2 - 2*b*ta
n(1/2*d*x + 1/2*c) - a)))/d
```

maple [A] time = 0.26, size = 118, normalized size = 1.44

$$-\frac{\frac{2\left(-\frac{b^2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{\left(a^2+b^2\right)a}-\frac{b}{a^2+b^2}\right)}{a\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)b-a}+\frac{2a\,\mathrm{arctanh}\left(\frac{2a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-2b}{2\sqrt{a^2+b^2}}\right)}{\left(a^2+b^2\right)^{\frac{3}{2}}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)/(a+b*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(-2*(-b^2/(a^2+b^2)/a*tan(1/2*d*x+1/2*c)-b/(a^2+b^2))/(a*tan(1/2*d*x+1/
2*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)+2*a/(a^2+b^2)^(3/2)*arctanh(1/2*(2*a*tan(1
/2*d*x+1/2*c)-2*b)/(a^2+b^2)^(1/2)))
```

maxima [B] time = 0.69, size = 182, normalized size = 2.22

$$-\frac{\frac{a\log\left(\frac{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}+\sqrt{a^2+b^2}}{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}-\sqrt{a^2+b^2}}\right)}{\left(a^2+b^2\right)^{\frac{3}{2}}}+\frac{2\left(ab+\frac{b^2\sin(dx+c)}{\cos(dx+c)+1}\right)}{a^4+a^2b^2+\frac{2\left(a^3b+ab^3\right)\sin(dx+c)}{\cos(dx+c)+1}-\frac{\left(a^4+a^2b^2\right)\sin(dx+c)^2}{(\cos(dx+c)+1)^2}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -(a*log((b - a*sin(d*x + c)/(cos(d*x + c) + 1) + sqrt(a^2 + b^2))/(b - a*si
n(d*x + c)/(cos(d*x + c) + 1) - sqrt(a^2 + b^2)))/(a^2 + b^2)^(3/2) + 2*(a*
b + b^2*sin(d*x + c)/(cos(d*x + c) + 1))/(a^4 + a^2*b^2 + 2*(a^3*b + a*b^3)
*sin(d*x + c)/(cos(d*x + c) + 1) - (a^4 + a^2*b^2)*sin(d*x + c)^2/(cos(d*x
+ c) + 1)^2))/d
```

mupad [B] time = 3.98, size = 136, normalized size = 1.66

$$-\frac{\frac{2b}{a^2+b^2}+\frac{2b^2\tan\left(\frac{c}{2}+\frac{dx}{2}\right)}{a\left(a^2+b^2\right)}}{d\left(-a\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^2+2b\tan\left(\frac{c}{2}+\frac{dx}{2}\right)+a\right)}+\frac{a\,\mathrm{atan}\left(\frac{a^2\,b\,1\mathrm{i}+b^3\,1\mathrm{i}-a\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\left(a^2+b^2\right)1\mathrm{i}}{\left(a^2+b^2\right)^{3/2}}\right)2\mathrm{i}}{d\left(a^2+b^2\right)^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)*(a + b*tan(c + d*x))^2),x)
```

```
[Out] (a*atan((a^2*b*1i + b^3*1i - a*tan(c/2 + (d*x)/2)*(a^2 + b^2)*1i)/(a^2 + b^
2)^(3/2))*2i)/(d*(a^2 + b^2)^(3/2)) - ((2*b)/(a^2 + b^2) + (2*b^2*tan(c/2 +
 (d*x)/2))/(a*(a^2 + b^2)))/(d*(a + 2*b*tan(c/2 + (d*x)/2) - a*tan(c/2 + (d
*x)/2)^2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\sec(c+dx)}{(a+b\tan(c+dx))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral(sec(c + d*x)/(a + b*tan(c + d*x))**2, x)
```

3.564 $\int \frac{\cos(c+dx)}{(a+b\tan(c+dx))^2}\,dx$

Optimal. Leaf size=157

$$\frac{\cos(c+dx)(a\tan(c+dx)+b)}{d\left(a^2+b^2\right)(a+b\tan(c+dx))}+\frac{b\left(a^2-2b^2\right)\sec(c+dx)}{d\left(a^2+b^2\right)^2(a+b\tan(c+dx))}-\frac{3ab^2\cos(c+dx)\sqrt{\sec^2(c+dx)}\,\tanh^{-1}\left(\frac{b-a\,\mathrm{ta}}{\sqrt{a^2+b^2}\ \cdots}\right.}{d\left(a^2+b^2\right)^{5/2}}$$

```
[Out] -3*a*b^2*arctanh((b-a*tan(d*x+c))/(a^2+b^2)^(1/2)/(sec(d*x+c)^2)^(1/2))*cos
(d*x+c)*(sec(d*x+c)^2)^(1/2)/(a^2+b^2)^(5/2)/d+b*(a^2-2*b^2)*sec(d*x+c)/(a^
2+b^2)^2/d/(a+b*tan(d*x+c))+cos(d*x+c)*(b+a*tan(d*x+c))/(a^2+b^2)/d/(a+b*ta
n(d*x+c))
```

Rubi [A] time = 0.13, antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {3512, 741, 807, 725, 206}

$$\frac{\cos(c+dx)(a\tan(c+dx)+b)}{d\left(a^2+b^2\right)(a+b\tan(c+dx))}+\frac{b\left(a^2-2b^2\right)\sec(c+dx)}{d\left(a^2+b^2\right)^2(a+b\tan(c+dx))}-\frac{3ab^2\cos(c+dx)\sqrt{\sec^2(c+dx)}\,\tanh^{-1}\left(\frac{b-a\,\mathrm{ta}}{\sqrt{a^2+b^2}\ \cdots}\right.}{d\left(a^2+b^2\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (-3*a*b^2*ArcTanh[(b - a*Tan[c + d*x])/(Sqrt[a^2 + b^2]*Sqrt[Sec[c + d*x]^2
]])]*Cos[c + d*x]*Sqrt[Sec[c + d*x]^2])/((a^2 + b^2)^(5/2)*d) + (b*(a^2 - 2*
b^2)*Sec[c + d*x])/((a^2 + b^2)^2*d*(a + b*Tan[c + d*x])) + (Cos[c + d*x]*(
b + a*Tan[c + d*x]))/((a^2 + b^2)*d*(a + b*Tan[c + d*x]))
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 725

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 741

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(a*e + c*d*x)*(a + c*x^2)^(p + 1))/(2*a*(p + 1)*(c*d^2
+ a*e^2)), x] + Dist[1/(2*a*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*Simp[
c*d^2*(2*p + 3) + a*e^2*(m + 2*p + 3) + c*e*d*(m + 2*p + 4)*x, x]*(a + c*x^
2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] &&
 LtQ[p, -1] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 807

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> -Simp[((e*f - d*g)*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))
/(2*(p + 1)*(c*d^2 + a*e^2)), x] + Dist[(c*d*f + a*e*g)/(c*d^2 + a*e^2), In
t[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m, p}
, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos(c+dx)}{(a+b\tan(c+dx))^2}\,dx = \frac{\left(\cos(c+dx)\sqrt{\sec^2(c+dx)}\right)\text{Subst}\left(\int \frac{1}{(a+x)^2\left(1+\frac{x^2}{b^2}\right)^{3/2}}\,dx, x, b\tan(c+dx)\right)}{bd}$$

$$= \frac{\cos(c+dx)(b+a\tan(c+dx))}{\left(a^2+b^2\right)d(a+b\tan(c+dx))} - \frac{\left(b\cos(c+dx)\sqrt{\sec^2(c+dx)}\right)\text{Subst}\left(\int \frac{-2-\frac{a}{b}\cdots}{(a+x)^2\sqrt{\cdots}}\cdots\right)}{\left(a^2+b^2\right)d}$$

$$= \frac{b\left(a^2-2b^2\right)\sec(c+dx)}{\left(a^2+b^2\right)^2 d(a+b\tan(c+dx))} + \frac{\cos(c+dx)(b+a\tan(c+dx))}{\left(a^2+b^2\right)d(a+b\tan(c+dx))} + \frac{\left(3ab\cos(c+\cdots\right.}{\cdots}$$

$$= \frac{b\left(a^2-2b^2\right)\sec(c+dx)}{\left(a^2+b^2\right)^2 d(a+b\tan(c+dx))} + \frac{\cos(c+dx)(b+a\tan(c+dx))}{\left(a^2+b^2\right)d(a+b\tan(c+dx))} - \frac{\left(3ab\cos(c+\cdots\right.}{\cdots}$$

$$= -\frac{3ab^2\tanh^{-1}\left(\frac{b\left(1-\frac{a\tan(c+dx)}{b}\right)}{\sqrt{a^2+b^2}\sqrt{\sec^2(c+dx)}}\right)\cos(c+dx)\sqrt{\sec^2(c+dx)}}{\left(a^2+b^2\right)^{5/2}d} + \frac{b\left(a^2-2b^2\right)\text{se}\cdots}{\left(a^2+b^2\right)^2 d(a+b\cdots}$$

Mathematica [A] time = 0.56, size = 153, normalized size = 0.97

$$\frac{\sec(c+dx)\left(\left(a^2+b^2\right)\left(a\left(a^2+b^2\right)\sin(2(c+dx))+b\left(a^2+b^2\right)\cos(2(c+dx))+3b\left(a^2-b^2\right)\right)+12ab^2\sqrt{a^2+b^2}\cdots\right.}{2d\left(a^2+b^2\right)^3(a+b\tan(c+dx))}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (Sec[c + d*x]*(12*a*b^2*Sqrt[a^2 + b^2]*ArcTanh[(-b + a*Tan[(c + d*x)/2])/S
qrt[a^2 + b^2]]*(a*Cos[c + d*x] + b*Sin[c + d*x]) + (a^2 + b^2)*(3*b*(a^2 -
 b^2) + b*(a^2 + b^2)*Cos[2*(c + d*x)] + a*(a^2 + b^2)*Sin[2*(c + d*x)])))/
(2*(a^2 + b^2)^3*d*(a + b*Tan[c + d*x]))
```

fricas [A] time = 0.67, size = 302, normalized size = 1.92

$$\frac{2a^4b-2a^2b^3-4b^5+2\left(a^4b+2a^2b^3+b^5\right)\cos(dx+c)^2+2\left(a^5+2a^3b^2+ab^4\right)\cos(dx+c)\sin(dx+c)+3\cdots}{2\left(\left(a^7+3a^5b^2+3a^3b^4+ab^6\right)d\cos(\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/2*(2*a^4*b - 2*a^2*b^3 - 4*b^5 + 2*(a^4*b + 2*a^2*b^3 + b^5)*cos(d*x + c)
^2 + 2*(a^5 + 2*a^3*b^2 + a*b^4)*cos(d*x + c)*sin(d*x + c) + 3*(a^2*b^2*cos
(d*x + c) + a*b^3*sin(d*x + c))*sqrt(a^2 + b^2)*log(-(2*a*b*cos(d*x + c)*si
n(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 - 2*a^2 - b^2 + 2*sqrt(a^2 + b^2)*(
b*cos(d*x + c) - a*sin(d*x + c)))/(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 -
 b^2)*cos(d*x + c)^2 + b^2)))/((a^7 + 3*a^5*b^2 + 3*a^3*b^4 + a*b^6)*d*cos(
d*x + c) + (a^6*b + 3*a^4*b^3 + 3*a^2*b^5 + b^7)*d*sin(d*x + c))
```

giac [A] time = 3.73, size = 286, normalized size = 1.82

$$-\frac{\frac{3ab^2\log\left(\frac{\left|2a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-2b-2\sqrt{a^2+b^2}\right|}{\left|2a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-2b+2\sqrt{a^2+b^2}\right|}\right)}{\left(a^4+2a^2b^2+b^4\right)\sqrt{a^2+b^2}}-\frac{2\left(a^4\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-a^2b^2\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3+b^4\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3+3ab^3\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-a^4\tan\left(\frac{1}{2}dx+\frac{1}{2}\cdots\right.\right.}{\left(a^5+2a^3b^2+ab^4\right)\left(a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^4-2b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3-2b\,\mathrm{ta}\cdots\right.}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -(3*a*b^2*log(abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b - 2*sqrt(a^2 + b^2))/abs(2
*a*tan(1/2*d*x + 1/2*c) - 2*b + 2*sqrt(a^2 + b^2)))/((a^4 + 2*a^2*b^2 + b^4
)*sqrt(a^2 + b^2)) - 2*(a^4*tan(1/2*d*x + 1/2*c)^3 - a^2*b^2*tan(1/2*d*x +
1/2*c)^3 + b^4*tan(1/2*d*x + 1/2*c)^3 + 3*a*b^3*tan(1/2*d*x + 1/2*c)^2 - a^
4*tan(1/2*d*x + 1/2*c) - 3*a^2*b^2*tan(1/2*d*x + 1/2*c) + b^4*tan(1/2*d*x +
 1/2*c) - 2*a^3*b + a*b^3)/((a^5 + 2*a^3*b^2 + a*b^4)*(a*tan(1/2*d*x + 1/2*
c)^4 - 2*b*tan(1/2*d*x + 1/2*c)^3 - 2*b*tan(1/2*d*x + 1/2*c) - a)))/d
```

maple [A] time = 0.50, size = 172, normalized size = 1.10

$$-\frac{\frac{2b^2\left(\frac{-\frac{b^2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{a}-b}{a\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)b-a}-\frac{3a\,\mathrm{arctanh}\left(\frac{2a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-2b}{2\sqrt{a^2+b^2}}\right)}{\sqrt{a^2+b^2}}\right)}{\left(a^2+b^2\right)^2}-\frac{2\left(\left(-a^2+b^2\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-2ab\right)}{\left(a^4+2a^2b^2+b^4\right)\left(1+\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)/(a+b*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(-2*b^2/(a^2+b^2)^2*((-b^2/a*tan(1/2*d*x+1/2*c)-b)/(a*tan(1/2*d*x+1/2*c
)^2-2*tan(1/2*d*x+1/2*c)*b-a)-3*a/(a^2+b^2)^(1/2)*arctanh(1/2*(2*a*tan(1/2*
d*x+1/2*c)-2*b)/(a^2+b^2)^(1/2)))-2/(a^4+2*a^2*b^2+b^4)*((-a^2+b^2)*tan(1/2
*d*x+1/2*c)-2*a*b)/(1+tan(1/2*d*x+1/2*c)^2))
```

maxima [B] time = 0.51, size = 348, normalized size = 2.22

$$-\frac{\frac{3ab^2\log\left(\frac{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}+\sqrt{a^2+b^2}}{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}-\sqrt{a^2+b^2}}\right)}{\left(a^4+2a^2b^2+b^4\right)\sqrt{a^2+b^2}}-\frac{2\left(2a^3b-ab^3-\frac{3ab^3\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{\left(a^4+3a^2b^2-b^4\right)\sin(dx+c)}{\cos(dx+c)+1}-\frac{\left(a^4-a^2b^2+b^4\right)\sin(dx+c)^3}{(\cos(dx+c)+1)^3}\right)}{a^6+2a^4b^2+a^2b^4+\frac{2\left(a^5b+2a^3b^3+ab^5\right)\sin(dx+c)}{\cos(dx+c)+1}+\frac{2\left(a^5b+2a^3b^3+ab^5\right)\sin(dx+c)^3}{(\cos(dx+c)+1)^3}-\frac{\left(a^6+2a^4b^2+a^2b^4\right)\sin(dx+c)^4}{(\cos(dx+c)+1)^4}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -(3*a*b^2*log((b - a*sin(d*x + c)/(cos(d*x + c) + 1) + sqrt(a^2 + b^2))/(b
- a*sin(d*x + c)/(cos(d*x + c) + 1) - sqrt(a^2 + b^2)))/((a^4 + 2*a^2*b^2 +
```

```
b^4)*sqrt(a^2 + b^2)) - 2*(2*a^3*b - a*b^3 - 3*a*b^3*sin(d*x + c)^2/(cos(d
*x + c) + 1)^2 + (a^4 + 3*a^2*b^2 - b^4)*sin(d*x + c)/(cos(d*x + c) + 1) -
(a^4 - a^2*b^2 + b^4)*sin(d*x + c)^3/(cos(d*x + c) + 1)^3)/(a^6 + 2*a^4*b^2
 + a^2*b^4 + 2*(a^5*b + 2*a^3*b^3 + a*b^5)*sin(d*x + c)/(cos(d*x + c) + 1)
+ 2*(a^5*b + 2*a^3*b^3 + a*b^5)*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 - (a^6
+ 2*a^4*b^2 + a^2*b^4)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4))/d
```

mupad [B] time = 5.95, size = 286, normalized size = 1.82

$$\frac{\frac{4\,a^2\,b-2\,b^3}{a^4+2\,a^2\,b^2+b^4}-\frac{6\,b^3\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2}{a^4+2\,a^2\,b^2+b^4}+\frac{2\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\,\left(a^4+3\,a^2\,b^2-b^4\right)}{a\,\left(a^4+2\,a^2\,b^2+b^4\right)}-\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3\,\left(2\,a^4-2\,a^2\,b^2+2\,b^4\right)}{a\,\left(a^4+2\,a^2\,b^2+b^4\right)}}{d\,\left(-a\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4+2\,b\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3+2\,b\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+a\right)}-\frac{6\,a\,b^2\,\mathrm{atanh}\left(\frac{a^4\,b+b^5+2\,a^2\,b^3-a}{}\right.}{d\,\left(a^2+b\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)/(a + b*tan(c + d*x))^2,x)
```

```
[Out] ((4*a^2*b - 2*b^3)/(a^4 + b^4 + 2*a^2*b^2) - (6*b^3*tan(c/2 + (d*x)/2)^2)/(
a^4 + b^4 + 2*a^2*b^2) + (2*tan(c/2 + (d*x)/2)*(a^4 - b^4 + 3*a^2*b^2))/(a*
(a^4 + b^4 + 2*a^2*b^2)) - (tan(c/2 + (d*x)/2)^3*(2*a^4 + 2*b^4 - 2*a^2*b^2
))/(a*(a^4 + b^4 + 2*a^2*b^2)))/(d*(a + 2*b*tan(c/2 + (d*x)/2) - a*tan(c/2
+ (d*x)/2)^4 + 2*b*tan(c/2 + (d*x)/2)^3)) - (6*a*b^2*atanh((a^4*b + b^5 + 2
*a^2*b^3 - a*tan(c/2 + (d*x)/2)*(a^4 + b^4 + 2*a^2*b^2))/(a^2 + b^2)^(5/2))
)/(d*(a^2 + b^2)^(5/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos\left(c+dx\right)}{\left(a+b\tan\left(c+dx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+b*tan(d*x+c))**2,x)
```

```
[Out] Integral(cos(c + d*x)/(a + b*tan(c + d*x))**2, x)
```

3.565 $\int \frac{\cos^3(c+dx)}{(a+b\tan(c+dx))^2}\,dx$

Optimal. Leaf size=241

$$\frac{\cos^3(c+dx)(a\tan(c+dx)+b)}{3d\left(a^2+b^2\right)(a+b\tan(c+dx))}-\frac{\cos(c+dx)\left(b\left(a^2-4b^2\right)-a\left(2a^2+7b^2\right)\tan(c+dx)\right)}{3d\left(a^2+b^2\right)^2(a+b\tan(c+dx))}-\frac{5ab^4\cos(c+dx)\sqrt{\sec^2(c}}{d}$$

```
[Out] -5*a*b^4*arctanh((b-a*tan(d*x+c))/(a^2+b^2)^(1/2)/(sec(d*x+c)^2)^(1/2))*cos
(d*x+c)*(sec(d*x+c)^2)^(1/2)/(a^2+b^2)^(7/2)/d+1/3*b*(2*a^4+9*a^2*b^2-8*b^4
)*sec(d*x+c)/(a^2+b^2)^3/d/(a+b*tan(d*x+c))+1/3*cos(d*x+c)^3*(b+a*tan(d*x+c
))/(a^2+b^2)/d/(a+b*tan(d*x+c))-1/3*cos(d*x+c)*(b*(a^2-4*b^2)-a*(2*a^2+7*b^
2)*tan(d*x+c))/(a^2+b^2)^2/d/(a+b*tan(d*x+c))
```

Rubi [A] time = 0.26, antiderivative size = 241, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {3512, 741, 823, 807, 725, 206}

$$\frac{\cos^3(c+dx)(a\tan(c+dx)+b)}{3d\left(a^2+b^2\right)(a+b\tan(c+dx))}-\frac{\cos(c+dx)\left(b\left(a^2-4b^2\right)-a\left(2a^2+7b^2\right)\tan(c+dx)\right)}{3d\left(a^2+b^2\right)^2(a+b\tan(c+dx))}+\frac{b\left(9a^2b^2+2a^4-8b^4\right)\text{se}}{3d\left(a^2+b^2\right)^3(a+b\tan}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (-5*a*b^4*ArcTanh[(b - a*Tan[c + d*x])/(Sqrt[a^2 + b^2]*Sqrt[Sec[c + d*x]^2
])]*Cos[c + d*x]*Sqrt[Sec[c + d*x]^2])/((a^2 + b^2)^(7/2)*d) + (b*(2*a^4 +
9*a^2*b^2 - 8*b^4)*Sec[c + d*x])/(3*(a^2 + b^2)^3*d*(a + b*Tan[c + d*x])) +
 (Cos[c + d*x]^3*(b + a*Tan[c + d*x]))/(3*(a^2 + b^2)*d*(a + b*Tan[c + d*x]
)) - (Cos[c + d*x]*(b*(a^2 - 4*b^2) - a*(2*a^2 + 7*b^2)*Tan[c + d*x]))/(3*(
a^2 + b^2)^2*d*(a + b*Tan[c + d*x]))
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 725

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 741

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(a*e + c*d*x)*(a + c*x^2)^(p + 1))/(2*a*(p + 1)*(c*d^2
+ a*e^2)), x] + Dist[1/(2*a*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*Simp[
c*d^2*(2*p + 3) + a*e^2*(m + 2*p + 3) + c*e*d*(m + 2*p + 4)*x, x]*(a + c*x^
2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] &&
 LtQ[p, -1] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 807

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> -Simp[((e*f - d*g)*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))
```

```
/(2*(p + 1)*(c*d^2 + a*e^2)), x] + Dist[(c*d*f + a*e*g)/(c*d^2 + a*e^2), In
t[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m, p}
, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0]
```

Rule 823

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_), x_Symbol] :> -Simp[((d + e*x)^(m + 1)*(f*a*c*e - a*g*c*d + c*(c*d*f + a
*e*g)*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)*(c*d^2 + a*e^2)), x] + Dist[1/
(2*a*c*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*(a + c*x^2)^(p + 1)*Simp[f
*(c^2*d^2*(2*p + 3) + a*c*e^2*(m + 2*p + 3)) - a*c*d*e*g*m + c*e*(c*d*f + a
*e*g)*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*
d^2 + a*e^2, 0] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2
*m, 2*p])
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] && !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^3(c+dx)}{(a+b\tan(c+dx))^2}\,dx = \frac{\left(\cos(c+dx)\sqrt{\sec^2(c+dx)}\right)\text{Subst}\left(\int \frac{1}{(a+x)^2\left(1+\frac{x^2}{b^2}\right)^{5/2}}\,dx, x, b\tan(c+dx)\right)}{bd}$$

$$= \frac{\cos^3(c+dx)(b+a\tan(c+dx))}{3\left(a^2+b^2\right)d(a+b\tan(c+dx))} - \frac{\left(b\cos(c+dx)\sqrt{\sec^2(c+dx)}\right)\text{Subst}\left(\int \frac{-2\left(2+\frac{a}{b}\right.}{(a+x)^2\left(\right.}\right.}{3\left(a^2+b^2\right)d}$$

$$= \frac{\cos^3(c+dx)(b+a\tan(c+dx))}{3\left(a^2+b^2\right)d(a+b\tan(c+dx))} - \frac{\cos(c+dx)\left(b\left(a^2-4b^2\right)-a\left(2a^2+7b^2\right)\tan(c\right.}{3\left(a^2+b^2\right)^2 d(a+b\tan(c+dx))}$$

$$= \frac{b\left(2a^4+9a^2b^2-8b^4\right)\sec(c+dx)}{3\left(a^2+b^2\right)^3 d(a+b\tan(c+dx))} + \frac{\cos^3(c+dx)(b+a\tan(c+dx))}{3\left(a^2+b^2\right)d(a+b\tan(c+dx))} - \frac{\cos(c+d}{}$$

$$= \frac{b\left(2a^4+9a^2b^2-8b^4\right)\sec(c+dx)}{3\left(a^2+b^2\right)^3 d(a+b\tan(c+dx))} + \frac{\cos^3(c+dx)(b+a\tan(c+dx))}{3\left(a^2+b^2\right)d(a+b\tan(c+dx))} - \frac{\cos(c+d}{}$$

$$= -\frac{5ab^4\tanh^{-1}\left(\frac{b\left(1-\frac{a\tan(c+dx)}{b}\right)}{\sqrt{a^2+b^2}\sqrt{\sec^2(c+dx)}}\right)\cos(c+dx)\sqrt{\sec^2(c+dx)}}{\left(a^2+b^2\right)^{7/2}d} + \frac{b\left(2a^4+9a^2b^2-\right.}{3\left(a^2+b^2\right)^3 d(a+}$$

Mathematica [A] time = 1.18, size = 249, normalized size = 1.03

$$\frac{\sec(c+dx)\left(240ab^4\sqrt{a^2+b^2}\,(a\cos(c+dx)+b\sin(c+dx))\tanh^{-1}\left(\frac{a\tan\left(\frac{1}{2}(c+dx)\right)-b}{\sqrt{a^2+b^2}}\right)+\left(a^2+b^2\right)\left(10a^5\sin(2(c+\ldots\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3/(a + b*Tan[c + d*x])^2,x]
```

```
[Out] (Sec[c + d*x]*(240*a*b^4*Sqrt[a^2 + b^2]*ArcTanh[(-b + a*Tan[(c + d*x)/2])/
Sqrt[a^2 + b^2]]*(a*Cos[c + d*x] + b*Sin[c + d*x]) + (a^2 + b^2)*(15*a^4*b
+ 90*a^2*b^3 - 45*b^5 + 20*b^3*(a^2 + b^2)*Cos[2*(c + d*x)] + b*(a^2 + b^2)
^2*Cos[4*(c + d*x)] + 10*a^5*Sin[2*(c + d*x)] + 40*a^3*b^2*Sin[2*(c + d*x)]
 + 30*a*b^4*Sin[2*(c + d*x)] + a^5*Sin[4*(c + d*x)] + 2*a^3*b^2*Sin[4*(c +
d*x)] + a*b^4*Sin[4*(c + d*x)])))/(24*(a^2 + b^2)^4*d*(a + b*Tan[c + d*x]))
```

fricas [A] time = 0.62, size = 418, normalized size = 1.73

$$\frac{4\,a^6b+22\,a^4b^3+2\,a^2b^5-16\,b^7+2\left(a^6b+3\,a^4b^3+3\,a^2b^5+b^7\right)\cos\left(dx+c\right)^4-2\left(a^6b-2\,a^4b^3-7\,a^2b^5-4\,b^7\right)\mathrm{co}\ldots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+b*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/6*(4*a^6*b + 22*a^4*b^3 + 2*a^2*b^5 - 16*b^7 + 2*(a^6*b + 3*a^4*b^3 + 3*a
^2*b^5 + b^7)*cos(d*x + c)^4 - 2*(a^6*b - 2*a^4*b^3 - 7*a^2*b^5 - 4*b^7)*co
s(d*x + c)^2 + 15*(a^2*b^4*cos(d*x + c) + a*b^5*sin(d*x + c))*sqrt(a^2 + b^
2)*log(-(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 - 2*a
^2 - b^2 + 2*sqrt(a^2 + b^2)*(b*cos(d*x + c) - a*sin(d*x + c)))/(2*a*b*cos(
d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 + b^2)) + 2*((a^7 + 3*a^
5*b^2 + 3*a^3*b^4 + a*b^6)*cos(d*x + c)^3 + (2*a^7 + 11*a^5*b^2 + 16*a^3*b^
4 + 7*a*b^6)*cos(d*x + c))*sin(d*x + c))/((a^9 + 4*a^7*b^2 + 6*a^5*b^4 + 4*
a^3*b^6 + a*b^8)*d*cos(d*x + c) + (a^8*b + 4*a^6*b^3 + 6*a^4*b^5 + 4*a^2*b^
7 + b^9)*d*sin(d*x + c))
```

giac [A] time = 7.03, size = 438, normalized size = 1.82

$$-\frac{\frac{15\,ab^4\log\left(\frac{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2\,b-2\,\sqrt{a^2+b^2}\right|}{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2\,b+2\,\sqrt{a^2+b^2}\right|}\right)}{\left(a^6+3\,a^4b^2+3\,a^2b^4+b^6\right)\sqrt{a^2+b^2}}-\frac{6\left(b^6\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+ab^5\right)}{\left(a^7+3\,a^5b^2+3\,a^3b^4+ab^6\right)\left(a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-2\,b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-a\right)}-\frac{2\left(3\,a^4\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^5+9\,a^2b^2\ldots\right.}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+b*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] -1/3*(15*a*b^4*log(abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b - 2*sqrt(a^2 + b^2))/
abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b + 2*sqrt(a^2 + b^2)))/((a^6 + 3*a^4*b^2
+ 3*a^2*b^4 + b^6)*sqrt(a^2 + b^2)) - 6*(b^6*tan(1/2*d*x + 1/2*c) + a*b^5)/
((a^7 + 3*a^5*b^2 + 3*a^3*b^4 + a*b^6)*(a*tan(1/2*d*x + 1/2*c)^2 - 2*b*tan(
1/2*d*x + 1/2*c) - a)) - 2*(3*a^4*tan(1/2*d*x + 1/2*c)^5 + 9*a^2*b^2*tan(1/
2*d*x + 1/2*c)^5 - 6*b^4*tan(1/2*d*x + 1/2*c)^5 + 6*a^3*b*tan(1/2*d*x + 1/2
*c)^4 + 18*a*b^3*tan(1/2*d*x + 1/2*c)^4 + 2*a^4*tan(1/2*d*x + 1/2*c)^3 + 18
*a^2*b^2*tan(1/2*d*x + 1/2*c)^3 - 8*b^4*tan(1/2*d*x + 1/2*c)^3 + 24*a*b^3*t
an(1/2*d*x + 1/2*c)^2 + 3*a^4*tan(1/2*d*x + 1/2*c) + 9*a^2*b^2*tan(1/2*d*x
```

```
+ 1/2*c) - 6*b^4*tan(1/2*d*x + 1/2*c) + 2*a^3*b + 14*a*b^3)/((a^6 + 3*a^4*b
^2 + 3*a^2*b^4 + b^6)*(tan(1/2*d*x + 1/2*c)^2 + 1)^3))/d
```

maple [A] time = 0.52, size = 320, normalized size = 1.33

$$-\frac{\frac{2b^{4}\left(\frac{-\frac{b^{2}\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{a}-b}{a\left(\tan^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)b-a}-\frac{5a\,\mathrm{arctanh}\left(\frac{2a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-2b}{2\sqrt{a^{2}+b^{2}}}\right)}{\sqrt{a^{2}+b^{2}}}\right)}{\left(a^{4}+2a^{2}b^{2}+b^{4}\right)\left(a^{2}+b^{2}\right)}-\frac{2\left(\left(-a^{4}-3a^{2}b^{2}+2b^{4}\right)\left(\tan^{5}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(-2a^{3}b-6ab^{3}\right)\left(\tan^{4}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\left(-\frac{2}{3}a^{4}-\right.\right.}{\left(a^{2}+b^{2}\right)\left(a^{4}\right.}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3/(a+b*tan(d*x+c))^2,x)
```

```
[Out] 1/d*(-2*b^4/(a^4+2*a^2*b^2+b^4)/(a^2+b^2)*((-b^2/a*tan(1/2*d*x+1/2*c)-b)/(a
*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)-5*a/(a^2+b^2)^(1/2)*arctanh
(1/2*(2*a*tan(1/2*d*x+1/2*c)-2*b)/(a^2+b^2)^(1/2)))-2/(a^2+b^2)/(a^4+2*a^2*
b^2+b^4)*((-a^4-3*a^2*b^2+2*b^4)*tan(1/2*d*x+1/2*c)^5+(-2*a^3*b-6*a*b^3)*ta
n(1/2*d*x+1/2*c)^4+(-2/3*a^4-6*a^2*b^2+8/3*b^4)*tan(1/2*d*x+1/2*c)^3-8*a*b^
3*tan(1/2*d*x+1/2*c)^2+(-a^4-3*a^2*b^2+2*b^4)*tan(1/2*d*x+1/2*c)-2/3*a^3*b-
14/3*a*b^3)/(1+tan(1/2*d*x+1/2*c)^2)^3)
```

maxima [B] time = 0.62, size = 772, normalized size = 3.20

$$-\frac{\frac{15ab^{4}\log\left(\frac{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}+\sqrt{a^{2}+b^{2}}}{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}-\sqrt{a^{2}+b^{2}}}\right)}{\left(a^{6}+3a^{4}b^{2}+3a^{2}b^{4}+b^{6}\right)\sqrt{a^{2}+b^{2}}}-\frac{2\left(2a^{5}b+14a^{3}b^{3}-3ab^{5}-\frac{15ab^{5}\sin(dx+c)^{6}}{(\cos(dx+c)+1)^{6}}+\frac{\left(3a^{6}+13a^{4}b^{2}+22a^{2}b^{4}-3b^{6}\right)\sin(dx+c)}{\cos(dx+c)+1}+\frac{\left(4a^{5}b+28a^{3}b^{3}-\right.}{(\cos(d}\right.}{a^{8}+3a^{6}b^{2}+3a^{4}b^{4}+a^{2}b^{6}+\frac{2\left(a^{7}b+3a^{5}b^{3}+3a^{3}b^{5}+ab^{7}\right)\sin(dx+c)}{\cos(dx+c)+1}+\frac{2\left(a^{8}+3a^{6}b^{2}+3a^{4}b^{4}+a^{2}b^{6}\right)\sin(dx+c)^{2}}{(\cos(dx+c)+1)^{2}}+\frac{6\left(a^{7}b+3a^{5}\right.}{}}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+b*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] -1/3*(15*a*b^4*log((b - a*sin(d*x + c)/(cos(d*x + c) + 1) + sqrt(a^2 + b^2)
)/(b - a*sin(d*x + c)/(cos(d*x + c) + 1) - sqrt(a^2 + b^2)))/((a^6 + 3*a^4*
b^2 + 3*a^2*b^4 + b^6)*sqrt(a^2 + b^2)) - 2*(2*a^5*b + 14*a^3*b^3 - 3*a*b^5
 - 15*a*b^5*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 + (3*a^6 + 13*a^4*b^2 + 22*
a^2*b^4 - 3*b^6)*sin(d*x + c)/(cos(d*x + c) + 1) + (4*a^5*b + 28*a^3*b^3 -
21*a*b^5)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - (a^6 - 9*a^4*b^2 - 46*a^2*b
^4 + 9*b^6)*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 5*(2*a^5*b + 6*a^3*b^3 -
5*a*b^5)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + (a^6 + 3*a^4*b^2 + 38*a^2*b^
4 - 9*b^6)*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 3*(a^6 + 3*a^4*b^2 - 2*a^2
*b^4 + b^6)*sin(d*x + c)^7/(cos(d*x + c) + 1)^7)/(a^8 + 3*a^6*b^2 + 3*a^4*b
^4 + a^2*b^6 + 2*(a^7*b + 3*a^5*b^3 + 3*a^3*b^5 + a*b^7)*sin(d*x + c)/(cos(
d*x + c) + 1) + 2*(a^8 + 3*a^6*b^2 + 3*a^4*b^4 + a^2*b^6)*sin(d*x + c)^2/(c
os(d*x + c) + 1)^2 + 6*(a^7*b + 3*a^5*b^3 + 3*a^3*b^5 + a*b^7)*sin(d*x + c)
^3/(cos(d*x + c) + 1)^3 + 6*(a^7*b + 3*a^5*b^3 + 3*a^3*b^5 + a*b^7)*sin(d*x
 + c)^5/(cos(d*x + c) + 1)^5 - 2*(a^8 + 3*a^6*b^2 + 3*a^4*b^4 + a^2*b^6)*si
n(d*x + c)^6/(cos(d*x + c) + 1)^6 + 2*(a^7*b + 3*a^5*b^3 + 3*a^3*b^5 + a*b^
7)*sin(d*x + c)^7/(cos(d*x + c) + 1)^7 - (a^8 + 3*a^6*b^2 + 3*a^4*b^4 + a^2
*b^6)*sin(d*x + c)^8/(cos(d*x + c) + 1)^8))/d
```

mupad [B] time = 7.11, size = 674, normalized size = 2.80

$$\frac{\frac{2\left(2a^{4}b+14a^{2}b^{3}-3b^{5}\right)}{3\left(a^{2}+b^{2}\right)\left(a^{4}+2a^{2}b^{2}+b^{4}\right)}-\frac{10b^{5}\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{6}}{a^{6}+3a^{4}b^{2}+3a^{2}b^{4}+b^{6}}+\frac{10b\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{4}\left(2a^{4}+6a^{2}b^{2}-5b^{4}\right)}{3\left(a^{6}+3a^{4}b^{2}+3a^{2}b^{4}+b^{6}\right)}+\frac{2\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{2}\left(4a^{4}b+28a^{2}b^{3}-21b^{5}\right)}{3\left(a^{2}+b^{2}\right)\left(a^{4}+2a^{2}b^{2}+b^{4}\right)}-\frac{2\tan}{}}{d\left(-a\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{8}+2b\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{7}-2a\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^{6}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3/(a + b*tan(c + d*x))^2,x)
```

```
[Out] ((2*(2*a^4*b - 3*b^5 + 14*a^2*b^3))/(3*(a^2 + b^2)*(a^4 + b^4 + 2*a^2*b^2))
 - (10*b^5*tan(c/2 + (d*x)/2)^6)/(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2) + (10*
b*tan(c/2 + (d*x)/2)^4*(2*a^4 - 5*b^4 + 6*a^2*b^2))/(3*(a^6 + b^6 + 3*a^2*b
^4 + 3*a^4*b^2)) + (2*tan(c/2 + (d*x)/2)^2*(4*a^4*b - 21*b^5 + 28*a^2*b^3))
/(3*(a^2 + b^2)*(a^4 + b^4 + 2*a^2*b^2)) - (2*tan(c/2 + (d*x)/2)^7*(a^6 + b
^6 - 2*a^2*b^4 + 3*a^4*b^2))/(a*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2)) + (2*t
an(c/2 + (d*x)/2)*(3*a^6 - 3*b^6 + 22*a^2*b^4 + 13*a^4*b^2))/(3*a*(a^2 + b^
2)*(a^4 + b^4 + 2*a^2*b^2)) + (2*tan(c/2 + (d*x)/2)^5*(a^6 - 9*b^6 + 38*a^2
*b^4 + 3*a^4*b^2))/(3*a*(a^2 + b^2)*(a^4 + b^4 + 2*a^2*b^2)) - (2*tan(c/2 +
 (d*x)/2)^3*(a^6 + 9*b^6 - 46*a^2*b^4 - 9*a^4*b^2))/(3*a*(a^2 + b^2)*(a^4 +
 b^4 + 2*a^2*b^2)))/(d*(a + 2*b*tan(c/2 + (d*x)/2) + 2*a*tan(c/2 + (d*x)/2)
^2 - 2*a*tan(c/2 + (d*x)/2)^6 - a*tan(c/2 + (d*x)/2)^8 + 6*b*tan(c/2 + (d*x
)/2)^3 + 6*b*tan(c/2 + (d*x)/2)^5 + 2*b*tan(c/2 + (d*x)/2)^7)) - (10*a*b^4*
atanh((2*a^6*b + 2*b^7 + 6*a^2*b^5 + 6*a^4*b^3 - 2*a*tan(c/2 + (d*x)/2)*(a^
6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2))/(2*(a^2 + b^2)^(7/2))))/(d*(a^2 + b^2)^(7
/2))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3/(a+b*tan(d*x+c))**2,x)
```

```
[Out] Timed out
```

3.566 $\int \frac{\sec^8(c+dx)}{(a+b\tan(c+dx))^3}\,dx$

Optimal. Leaf size=185

$$\frac{6a\left(a^2+b^2\right)^2}{b^7d(a+b\tan(c+dx))}-\frac{\left(a^2+b^2\right)^3}{2b^7d(a+b\tan(c+dx))^2}+\frac{3\left(a^2+b^2\right)\left(5a^2+b^2\right)\log(a+b\tan(c+dx))}{b^7d}-\frac{a\left(10a^2+9b^2\right)}{b^6}$$

```
[Out] 3*(a^2+b^2)*(5*a^2+b^2)*ln(a+b*tan(d*x+c))/b^7/d-a*(10*a^2+9*b^2)*tan(d*x+c
)/b^6/d+3/2*(2*a^2+b^2)*tan(d*x+c)^2/b^5/d-a*tan(d*x+c)^3/b^4/d+1/4*tan(d*x
+c)^4/b^3/d-1/2*(a^2+b^2)^3/b^7/d/(a+b*tan(d*x+c))^2+6*a*(a^2+b^2)^2/b^7/d/
(a+b*tan(d*x+c))
```

Rubi [A] time = 0.16, antiderivative size = 185, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {3506, 697}

$$\frac{3\left(2a^2+b^2\right)\tan^2(c+dx)}{2b^5d}-\frac{a\left(10a^2+9b^2\right)\tan(c+dx)}{b^6d}+\frac{6a\left(a^2+b^2\right)^2}{b^7d(a+b\tan(c+dx))}-\frac{\left(a^2+b^2\right)^3}{2b^7d(a+b\tan(c+dx))^2}+\frac{3\left(a\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^8/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (3*(a^2 + b^2)*(5*a^2 + b^2)*Log[a + b*Tan[c + d*x]])/(b^7*d) - (a*(10*a^2
+ 9*b^2)*Tan[c + d*x])/(b^6*d) + (3*(2*a^2 + b^2)*Tan[c + d*x]^2)/(2*b^5*d)
 - (a*Tan[c + d*x]^3)/(b^4*d) + Tan[c + d*x]^4/(4*b^3*d) - (a^2 + b^2)^3/(2
*b^7*d*(a + b*Tan[c + d*x])^2) + (6*a*(a^2 + b^2)^2)/(b^7*d*(a + b*Tan[c +
d*x]))
```

Rule 697

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m},
 x] && NeQ[c*d^2 + a*e^2, 0] && IGtQ[p, 0]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\sec^8(c+dx)}{(a+b\tan(c+dx))^3}\,dx = \frac{\text{Subst}\left(\int \frac{\left(1+\frac{x^2}{b^2}\right)^3}{(a+x)^3}\,dx, x, b\tan(c+dx)\right)}{bd}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{-10a^3-9ab^2}{b^6}+\frac{3\left(2a^2+b^2\right)x}{b^6}-\frac{3ax^2}{b^6}+\frac{x^3}{b^6}+\frac{\left(a^2+b^2\right)^3}{b^6(a+x)^3}-\frac{6a\left(a^2+b^2\right)^2}{b^6(a+x)^2}+\frac{3\left(5a^4+6a^2b^2+b\right.}{b^6(a+x)}\right.\right.}{bd}$$

$$= \frac{3\left(a^2+b^2\right)\left(5a^2+b^2\right)\log(a+b\tan(c+dx))}{b^7d}-\frac{a\left(10a^2+9b^2\right)\tan(c+dx)}{b^6d}+\frac{3\left(2\right.}{}$$

Mathematica [A] time = 1.38, size = 272, normalized size = 1.47

$$\frac{4a^2b^4\tan^4(c+dx)+b^4\sec^4(c+dx)\left(a^2-2ab\tan(c+dx)+3b^2\right)-20ab^3\left(a^2+b^2\right)\tan^3(c+dx)+4b^2\tan^2(c+a}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^8/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (2*(a^2 + b^2)*(19*a^4 + 16*a^2*b^2 - 3*b^4 + 6*a^2*(5*a^2 + b^2)*Log[a + b
*Tan[c + d*x]]) + b^6*Sec[c + d*x]^6 + 4*a*b*(4*a^4 + 17*a^2*b^2 + 11*b^4 +
 6*(5*a^4 + 6*a^2*b^2 + b^4)*Log[a + b*Tan[c + d*x]])*Tan[c + d*x] + 4*b^2*
(-13*a^4 - 10*a^2*b^2 + 3*(5*a^4 + 6*a^2*b^2 + b^4)*Log[a + b*Tan[c + d*x]]
)*Tan[c + d*x]^2 - 20*a*b^3*(a^2 + b^2)*Tan[c + d*x]^3 + 4*a^2*b^4*Tan[c +
d*x]^4 + b^4*Sec[c + d*x]^4*(a^2 + 3*b^2 - 2*a*b*Tan[c + d*x]))/(4*b^7*d*(a
 + b*Tan[c + d*x])^2)
```

fricas [B] time = 2.19, size = 476, normalized size = 2.57

$$\frac{8\left(15\,a^4b^2+13\,a^2b^4\right)\cos\left(dx+c\right)^6+b^6-2\left(45\,a^4b^2+44\,a^2b^4+3\,b^6\right)\cos\left(dx+c\right)^4+\left(5\,a^2b^4+3\,b^6\right)\cos\left(dx+c\right)^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/4*(8*(15*a^4*b^2 + 13*a^2*b^4)*cos(d*x + c)^6 + b^6 - 2*(45*a^4*b^2 + 44*
a^2*b^4 + 3*b^6)*cos(d*x + c)^4 + (5*a^2*b^4 + 3*b^6)*cos(d*x + c)^2 + 6*((
5*a^6 + a^4*b^2 - 5*a^2*b^4 - b^6)*cos(d*x + c)^6 + 2*(5*a^5*b + 6*a^3*b^3
+ a*b^5)*cos(d*x + c)^5*sin(d*x + c) + (5*a^4*b^2 + 6*a^2*b^4 + b^6)*cos(d*
x + c)^4)*log(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2
+ b^2) - 6*((5*a^6 + a^4*b^2 - 5*a^2*b^4 - b^6)*cos(d*x + c)^6 + 2*(5*a^5*b
 + 6*a^3*b^3 + a*b^5)*cos(d*x + c)^5*sin(d*x + c) + (5*a^4*b^2 + 6*a^2*b^4
+ b^6)*cos(d*x + c)^4)*log(cos(d*x + c)^2) - 2*(a*b^5*cos(d*x + c) + 2*(15*
a^5*b - 2*a^3*b^3 - 13*a*b^5)*cos(d*x + c)^5 + 10*(a^3*b^3 + a*b^5)*cos(d*x
 + c)^3)*sin(d*x + c))/(2*a*b^8*d*cos(d*x + c)^5*sin(d*x + c) + b^9*d*cos(d
*x + c)^4 + (a^2*b^7 - b^9)*d*cos(d*x + c)^6)
```

giac [A] time = 1.62, size = 243, normalized size = 1.31

$$\frac{\frac{12\left(5\,a^4+6\,a^2b^2+b^4\right)\log(|b\tan(dx+c)+a|)}{b^7}-\frac{2\left(45\,a^4b^2\tan(dx+c)^2+54\,a^2b^4\tan(dx+c)^2+9\,b^6\tan(dx+c)^2+78\,a^5b\tan(dx+c)+84\,a^3b^3\tan(dx+c)+6\,ab^5\,\mathrm{t}\right.}{(b\tan(dx+c)+a)^2b^7}}{4\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/4*(12*(5*a^4 + 6*a^2*b^2 + b^4)*log(abs(b*tan(d*x + c) + a))/b^7 - 2*(45*
a^4*b^2*tan(d*x + c)^2 + 54*a^2*b^4*tan(d*x + c)^2 + 9*b^6*tan(d*x + c)^2 +
 78*a^5*b*tan(d*x + c) + 84*a^3*b^3*tan(d*x + c) + 6*a*b^5*tan(d*x + c) + 3
4*a^6 + 33*a^4*b^2 + b^6)/((b*tan(d*x + c) + a)^2*b^7) + (b^9*tan(d*x + c)^
4 - 4*a*b^8*tan(d*x + c)^3 + 12*a^2*b^7*tan(d*x + c)^2 + 6*b^9*tan(d*x + c)
^2 - 40*a^3*b^6*tan(d*x + c) - 36*a*b^8*tan(d*x + c))/b^12)/d
```

maple [A] time = 0.53, size = 321, normalized size = 1.74

$$\frac{\tan^4(dx+c)}{4b^3d}-\frac{a\left(\tan^3(dx+c)\right)}{b^4d}+\frac{3a^2\left(\tan^2(dx+c)\right)}{d\,b^5}+\frac{3\left(\tan^2(dx+c)\right)}{2b^3d}-\frac{10a^3\tan(dx+c)}{d\,b^6}-\frac{9a\tan(dx+c)}{b^4d}+\frac{15\,\mathrm{l}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^8/(a+b*tan(d*x+c))^3,x)
```

```
[Out] 1/4*tan(d*x+c)^4/b^3/d-a*tan(d*x+c)^3/b^4/d+3/d/b^5*a^2*tan(d*x+c)^2+3/2*ta
n(d*x+c)^2/b^3/d-10/d/b^6*a^3*tan(d*x+c)-9*a*tan(d*x+c)/b^4/d+15/d/b^7*ln(a
+b*tan(d*x+c))*a^4+18/d/b^5*ln(a+b*tan(d*x+c))*a^2+3*ln(a+b*tan(d*x+c))/b^3
/d+6/d*a^5/b^7/(a+b*tan(d*x+c))+12/d*a^3/b^5/(a+b*tan(d*x+c))+6*a/b^3/d/(a+
b*tan(d*x+c))-1/2/d/b^7/(a+b*tan(d*x+c))^2*a^6-3/2/d/b^5/(a+b*tan(d*x+c))^2
*a^4-3/2/d/b^3/(a+b*tan(d*x+c))^2*a^2-1/2/b/d/(a+b*tan(d*x+c))^2
```

maxima [A] time = 0.49, size = 200, normalized size = 1.08

$$\frac{\frac{2\left(11a^6+21a^4b^2+9a^2b^4-b^6+12\left(a^5b+2a^3b^3+ab^5\right)\tan(dx+c)\right)}{b^9\tan(dx+c)^2+2ab^8\tan(dx+c)+a^2b^7}+\frac{b^3\tan(dx+c)^4-4ab^2\tan(dx+c)^3+6\left(2a^2b+b^3\right)\tan(dx+c)^2-4\left(10a^3+9ab^2\right)\tan(\cdots}{b^6}}{4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^8/(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/4*(2*(11*a^6 + 21*a^4*b^2 + 9*a^2*b^4 - b^6 + 12*(a^5*b + 2*a^3*b^3 + a*b
^5)*tan(d*x + c))/(b^9*tan(d*x + c)^2 + 2*a*b^8*tan(d*x + c) + a^2*b^7) + (
b^3*tan(d*x + c)^4 - 4*a*b^2*tan(d*x + c)^3 + 6*(2*a^2*b + b^3)*tan(d*x + c
)^2 - 4*(10*a^3 + 9*a*b^2)*tan(d*x + c))/b^6 + 12*(5*a^4 + 6*a^2*b^2 + b^4)
*log(b*tan(d*x + c) + a)/b^7)/d
```

mupad [B] time = 3.68, size = 234, normalized size = 1.26

$$\frac{\frac{11\,a^6+21\,a^4\,b^2+9\,a^2\,b^4-b^6}{2\,b}+\tan\left(c+d\,x\right)\,\left(6\,a^5+12\,a^3\,b^2+6\,a\,b^4\right)}{d\,\left(a^2\,b^6+2\,a\,b^7\,\tan\left(c+d\,x\right)+b^8\,\tan\left(c+d\,x\right)^2\right)}+\frac{\tan\left(c+d\,x\right)^2\,\left(\frac{3}{2\,b^3}+\frac{3\,a^2}{b^5}\right)}{d}+\frac{\tan\left(c+d\,x\right)^4}{4\,b^3\,d}+\frac{\tan\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^8*(a + b*tan(c + d*x))^3),x)
```

```
[Out] ((11*a^6 - b^6 + 9*a^2*b^4 + 21*a^4*b^2)/(2*b) + tan(c + d*x)*(6*a*b^4 + 6*
a^5 + 12*a^3*b^2))/(d*(a^2*b^6 + b^8*tan(c + d*x)^2 + 2*a*b^7*tan(c + d*x))
) + (tan(c + d*x)^2*(3/(2*b^3) + (3*a^2)/b^5))/d + tan(c + d*x)^4/(4*b^3*d)
 + (tan(c + d*x)*((8*a^3)/b^6 - (3*a*(3/b^3 + (6*a^2)/b^5))/b))/d - (a*tan(
c + d*x)^3)/(b^4*d) + (log(a + b*tan(c + d*x))*(15*a^4 + 3*b^4 + 18*a^2*b^2
))/(b^7*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^{8}\left(c+dx\right)}{\left(a+b\tan\left(c+dx\right)\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**8/(a+b*tan(d*x+c))**3,x)
```

```
[Out] Integral(sec(c + d*x)**8/(a + b*tan(c + d*x))**3, x)
```

3.567 $\int \frac{\sec^6(c+dx)}{(a+b\tan(c+dx))^3}\,dx$

Optimal. Leaf size=121

$$-\frac{\left(a^2+b^2\right)^2}{2b^5d(a+b\tan(c+dx))^2}+\frac{4a\left(a^2+b^2\right)}{b^5d(a+b\tan(c+dx))}+\frac{2\left(3a^2+b^2\right)\log(a+b\tan(c+dx))}{b^5d}-\frac{3a\tan(c+dx)}{b^4d}+\frac{\tan^2(c+dx)}{2b^3d}$$

```
[Out] 2*(3*a^2+b^2)*ln(a+b*tan(d*x+c))/b^5/d-3*a*tan(d*x+c)/b^4/d+1/2*tan(d*x+c)^
2/b^3/d-1/2*(a^2+b^2)^2/b^5/d/(a+b*tan(d*x+c))^2+4*a*(a^2+b^2)/b^5/d/(a+b*t
an(d*x+c))
```

Rubi [A] time = 0.10, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {3506, 697}

$$-\frac{\left(a^2+b^2\right)^2}{2b^5d(a+b\tan(c+dx))^2}+\frac{4a\left(a^2+b^2\right)}{b^5d(a+b\tan(c+dx))}+\frac{2\left(3a^2+b^2\right)\log(a+b\tan(c+dx))}{b^5d}-\frac{3a\tan(c+dx)}{b^4d}+\frac{\tan^2(c+dx)}{2b^3d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (2*(3*a^2 + b^2)*Log[a + b*Tan[c + d*x]])/(b^5*d) - (3*a*Tan[c + d*x])/(b^4
*d) + Tan[c + d*x]^2/(2*b^3*d) - (a^2 + b^2)^2/(2*b^5*d*(a + b*Tan[c + d*x]
)^2) + (4*a*(a^2 + b^2))/(b^5*d*(a + b*Tan[c + d*x]))
```

Rule 697

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m},
 x] && NeQ[c*d^2 + a*e^2, 0] && IGtQ[p, 0]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sec^6(c+dx)}{(a+b\tan(c+dx))^3}\,dx &= \frac{\text{Subst}\left(\int \frac{\left(1+\frac{x^2}{b^2}\right)^2}{(a+x)^3}\,dx,x,b\tan(c+dx)\right)}{bd}\\
&= \frac{\text{Subst}\left(\int \left(-\frac{3a}{b^4}+\frac{x}{b^4}+\frac{\left(a^2+b^2\right)^2}{b^4(a+x)^3}-\frac{4a\left(a^2+b^2\right)}{b^4(a+x)^2}+\frac{2\left(3a^2+b^2\right)}{b^4(a+x)}\right)dx,x,b\tan(c+dx)\right)}{bd}\\
&= \frac{2\left(3a^2+b^2\right)\log(a+b\tan(c+dx))}{b^5d}-\frac{3a\tan(c+dx)}{b^4d}+\frac{\tan^2(c+dx)}{2b^3d}-\frac{\left(a^2+b^2\right)^2}{2b^5d(a+b\tan(c+dx))^2}+\dots
\end{aligned}$$

Mathematica [A] time = 3.48, size = 140, normalized size = 1.16

$$\frac{-2a\left(-\frac{a^2+b^2}{a+b\tan(c+dx)}-2a\log(a+b\tan(c+dx))+b\tan(c+dx)\right)+2\left(a^2+b^2\right)\left(\frac{3a^2+4ab\tan(c+dx)-b^2}{2(a+b\tan(c+dx))^2}+\log(a+b\tan(\dots\right.}{b^5d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] ((b^4*Sec[c + d*x]^4)/(2*(a + b*Tan[c + d*x])^2) - 2*a*(-2*a*Log[a + b*Tan[
c + d*x]] + b*Tan[c + d*x] - (a^2 + b^2)/(a + b*Tan[c + d*x])) + 2*(a^2 + b
^2)*(Log[a + b*Tan[c + d*x]] + (3*a^2 - b^2 + 4*a*b*Tan[c + d*x])/(2*(a + b
*Tan[c + d*x])^2)))/(b^5*d)
```

fricas [B] time = 0.81, size = 354, normalized size = 2.93

$$\frac{24\,a^2b^2\cos\left(dx+c\right)^4+b^4-2\left(9\,a^2b^2+b^4\right)\cos\left(dx+c\right)^2+2\left(\left(3\,a^4-2\,a^2b^2-b^4\right)\cos\left(dx+c\right)^4+2\left(3\,a^3b+ab\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/2*(24*a^2*b^2*cos(d*x + c)^4 + b^4 - 2*(9*a^2*b^2 + b^4)*cos(d*x + c)^2 +
 2*((3*a^4 - 2*a^2*b^2 - b^4)*cos(d*x + c)^4 + 2*(3*a^3*b + a*b^3)*cos(d*x
+ c)^3*sin(d*x + c) + (3*a^2*b^2 + b^4)*cos(d*x + c)^2)*log(2*a*b*cos(d*x +
 c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 + b^2) - 2*((3*a^4 - 2*a^2*b^
2 - b^4)*cos(d*x + c)^4 + 2*(3*a^3*b + a*b^3)*cos(d*x + c)^3*sin(d*x + c) +
 (3*a^2*b^2 + b^4)*cos(d*x + c)^2)*log(cos(d*x + c)^2) - 4*(a*b^3*cos(d*x +
 c) + 3*(a^3*b - a*b^3)*cos(d*x + c)^3)*sin(d*x + c))/(2*a*b^6*d*cos(d*x +
c)^3*sin(d*x + c) + b^7*d*cos(d*x + c)^2 + (a^2*b^5 - b^7)*d*cos(d*x + c)^4
)
```

giac [A] time = 2.04, size = 140, normalized size = 1.16

$$\frac{\frac{4\left(3\,a^2+b^2\right)\log\left(\left|b\tan\left(dx+c\right)+a\right|\right)}{b^5}+\frac{b^3\tan\left(dx+c\right)^2-6\,ab^2\tan\left(dx+c\right)}{b^6}-\frac{18\,a^2b^2\tan\left(dx+c\right)^2+6\,b^4\tan\left(dx+c\right)^2+28\,a^3b\tan\left(dx+c\right)+4\,ab^3\tan\left(dx+c\right)+1}{\left(b\tan\left(dx+c\right)+a\right)^2b^5}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/2*(4*(3*a^2 + b^2)*log(abs(b*tan(d*x + c) + a))/b^5 + (b^3*tan(d*x + c)^2
 - 6*a*b^2*tan(d*x + c))/b^6 - (18*a^2*b^2*tan(d*x + c)^2 + 6*b^4*tan(d*x +
 c)^2 + 28*a^3*b*tan(d*x + c) + 4*a*b^3*tan(d*x + c) + 11*a^4 + b^4)/((b*ta
n(d*x + c) + a)^2*b^5))/d
```

maple [A] time = 0.50, size = 184, normalized size = 1.52

$$\frac{\tan^2\left(dx+c\right)}{2b^3d}-\frac{3a\tan\left(dx+c\right)}{b^4d}+\frac{6\ln\left(a+b\tan\left(dx+c\right)\right)a^2}{d\,b^5}+\frac{2\ln\left(a+b\tan\left(dx+c\right)\right)}{b^3d}+\frac{4a^3}{d\,b^5\left(a+b\tan\left(dx+c\right)\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6/(a+b*tan(d*x+c))^3,x)
```

```
[Out] 1/2*tan(d*x+c)^2/b^3/d-3*a*tan(d*x+c)/b^4/d+6/d/b^5*ln(a+b*tan(d*x+c))*a^2+
2*ln(a+b*tan(d*x+c))/b^3/d+4/d*a^3/b^5/(a+b*tan(d*x+c))+4*a/b^3/d/(a+b*tan(
d*x+c))-1/2/d/b^5/(a+b*tan(d*x+c))^2*a^4-1/d/b^3/(a+b*tan(d*x+c))^2*a^2-1/2
/b/d/(a+b*tan(d*x+c))^2
```

maxima [A] time = 0.44, size = 128, normalized size = 1.06

$$\frac{\frac{7\,a^4+6\,a^2b^2-b^4+8\left(a^3b+ab^3\right)\tan\left(dx+c\right)}{b^7\tan\left(dx+c\right)^2+2\,ab^6\tan\left(dx+c\right)+a^2b^5}+\frac{b\tan\left(dx+c\right)^2-6\,a\tan\left(dx+c\right)}{b^4}+\frac{4\left(3\,a^2+b^2\right)\log\left(b\tan\left(dx+c\right)+a\right)}{b^5}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6/(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/2*((7*a^4 + 6*a^2*b^2 - b^4 + 8*(a^3*b + a*b^3)*tan(d*x + c))/(b^7*tan(d*
x + c)^2 + 2*a*b^6*tan(d*x + c) + a^2*b^5) + (b*tan(d*x + c)^2 - 6*a*tan(d*
x + c))/b^4 + 4*(3*a^2 + b^2)*log(b*tan(d*x + c) + a)/b^5)/d
```

mupad [B] time = 3.73, size = 143, normalized size = 1.18

$$\frac{\frac{7a^4+6a^2b^2-b^4}{2b}+\tan(c+d\,x)\left(4a^3+4a\,b^2\right)}{d\left(a^2b^4+2a\,b^5\tan(c+d\,x)+b^6\tan(c+d\,x)^2\right)}+\frac{\tan(c+d\,x)^2}{2b^3d}-\frac{3a\tan(c+d\,x)}{b^4d}+\frac{\ln(a+b\tan(c+d\,x))\left(6a^2\right.}{b^5d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^6*(a + b*tan(c + d*x))^3),x)
```

```
[Out] ((7*a^4 - b^4 + 6*a^2*b^2)/(2*b) + tan(c + d*x)*(4*a*b^2 + 4*a^3))/(d*(a^2*
b^4 + b^6*tan(c + d*x)^2 + 2*a*b^5*tan(c + d*x))) + tan(c + d*x)^2/(2*b^3*d
) - (3*a*tan(c + d*x))/(b^4*d) + (log(a + b*tan(c + d*x))*(6*a^2 + 2*b^2))/
(b^5*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^6(c+dx)}{(a+b\tan(c+dx))^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6/(a+b*tan(d*x+c))**3,x)
```

```
[Out] Integral(sec(c + d*x)**6/(a + b*tan(c + d*x))**3, x)
```

3.568 $\int \frac{\sec^4(c+dx)}{(a+b\tan(c+dx))^3}\,dx$

Optimal. Leaf size=69

$$-\frac{a^2+b^2}{2b^3d(a+b\tan(c+dx))^2}+\frac{2a}{b^3d(a+b\tan(c+dx))}+\frac{\log(a+b\tan(c+dx))}{b^3d}$$

```
[Out] ln(a+b*tan(d*x+c))/b^3/d+1/2*(-a^2-b^2)/b^3/d/(a+b*tan(d*x+c))^2+2*a/b^3/d/
(a+b*tan(d*x+c))
```

Rubi [A] time = 0.07, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {3506, 697}

$$-\frac{a^2+b^2}{2b^3d(a+b\tan(c+dx))^2}+\frac{2a}{b^3d(a+b\tan(c+dx))}+\frac{\log(a+b\tan(c+dx))}{b^3d}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] Log[a + b*Tan[c + d*x]]/(b^3*d) - (a^2 + b^2)/(2*b^3*d*(a + b*Tan[c + d*x])
^2) + (2*a)/(b^3*d*(a + b*Tan[c + d*x]))
```

Rule 697

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m},
 x] && NeQ[c*d^2 + a*e^2, 0] && IGtQ[p, 0]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^4(c+dx)}{(a+b\tan(c+dx))^3}\,dx &= \frac{\text{Subst}\left(\int \frac{1+\frac{x^2}{b^2}}{(a+x)^3}\,dx,x,b\tan(c+dx)\right)}{bd}\\ &= \frac{\text{Subst}\left(\int \left(\frac{a^2+b^2}{b^2(a+x)^3}-\frac{2a}{b^2(a+x)^2}+\frac{1}{b^2(a+x)}\right)dx,x,b\tan(c+dx)\right)}{bd}\\ &= \frac{\log(a+b\tan(c+dx))}{b^3d}-\frac{a^2+b^2}{2b^3d(a+b\tan(c+dx))^2}+\frac{2a}{b^3d(a+b\tan(c+dx))}\end{aligned}$$

Mathematica [A] time = 0.11, size = 57, normalized size = 0.83

$$\frac{-\frac{a^2+b^2}{2(a+b\tan(c+dx))^2}+\frac{2a}{a+b\tan(c+dx)}+\log(a+b\tan(c+dx))}{b^3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (Log[a + b*Tan[c + d*x]] - (a^2 + b^2)/(2*(a + b*Tan[c + d*x])^2) + (2*a)/(
a + b*Tan[c + d*x]))/(b^3*d)
```

fricas [B] time = 1.08, size = 284, normalized size = 4.12

$$\frac{4\,a^2b^2\cos\left(dx+c\right)^2-3\,a^2b^2-b^4-2\left(a^3b-ab^3\right)\cos\left(dx+c\right)\sin\left(dx+c\right)+\left(a^2b^2+b^4+\left(a^4-b^4\right)\cos\left(dx+c\right)^2+\cdots\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/2*(4*a^2*b^2*cos(d*x + c)^2 - 3*a^2*b^2 - b^4 - 2*(a^3*b - a*b^3)*cos(d*x
 + c)*sin(d*x + c) + (a^2*b^2 + b^4 + (a^4 - b^4)*cos(d*x + c)^2 + 2*(a^3*b
 + a*b^3)*cos(d*x + c)*sin(d*x + c))*log(2*a*b*cos(d*x + c)*sin(d*x + c) +
(a^2 - b^2)*cos(d*x + c)^2 + b^2) - (a^2*b^2 + b^4 + (a^4 - b^4)*cos(d*x +
c)^2 + 2*(a^3*b + a*b^3)*cos(d*x + c)*sin(d*x + c))*log(cos(d*x + c)^2))/((
a^4*b^3 - b^7)*d*cos(d*x + c)^2 + 2*(a^3*b^4 + a*b^6)*d*cos(d*x + c)*sin(d*
x + c) + (a^2*b^5 + b^7)*d)
```

giac [A] time = 2.85, size = 62, normalized size = 0.90

$$\frac{\frac{2\,\log\left(\left|b\tan\left(dx+c\right)+a\right|\right)}{b^3}-\frac{3\,b\tan\left(dx+c\right)^2+2\,a\tan\left(dx+c\right)+b}{\left(b\tan\left(dx+c\right)+a\right)^2b^2}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/2*(2*log(abs(b*tan(d*x + c) + a))/b^3 - (3*b*tan(d*x + c)^2 + 2*a*tan(d*x
 + c) + b)/((b*tan(d*x + c) + a)^2*b^2))/d
```

maple [A] time = 0.51, size = 84, normalized size = 1.22

$$\frac{\ln\left(a+b\tan\left(dx+c\right)\right)}{b^3d}+\frac{2a}{b^3d\left(a+b\tan\left(dx+c\right)\right)}-\frac{a^2}{2d\,b^3\left(a+b\tan\left(dx+c\right)\right)^2}-\frac{1}{2bd\left(a+b\tan\left(dx+c\right)\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4/(a+b*tan(d*x+c))^3,x)
```

```
[Out] ln(a+b*tan(d*x+c))/b^3/d+2*a/b^3/d/(a+b*tan(d*x+c))-1/2/d/b^3/(a+b*tan(d*x+
c))^2*a^2-1/2/b/d/(a+b*tan(d*x+c))^2
```

maxima [A] time = 0.35, size = 78, normalized size = 1.13

$$\frac{\frac{4\,ab\tan\left(dx+c\right)+3\,a^2-b^2}{b^5\tan\left(dx+c\right)^2+2\,ab^4\tan\left(dx+c\right)+a^2b^3}+\frac{2\,\log\left(b\tan\left(dx+c\right)+a\right)}{b^3}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4/(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/2*((4*a*b*tan(d*x + c) + 3*a^2 - b^2)/(b^5*tan(d*x + c)^2 + 2*a*b^4*tan(d
*x + c) + a^2*b^3) + 2*log(b*tan(d*x + c) + a)/b^3)/d
```

mupad [B] time = 3.75, size = 80, normalized size = 1.16

$$\frac{\frac{3\,a^2-b^2}{2\,b^3}+\frac{2\,a\tan\left(c+d\,x\right)}{b^2}}{d\,\left(a^2+2\,a\,b\tan\left(c+d\,x\right)+b^2\tan\left(c+d\,x\right)^2\right)}+\frac{\ln\left(a+b\tan\left(c+d\,x\right)\right)}{b^3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^4*(a + b*tan(c + d*x))^3),x)
```

```
[Out] ((3*a^2 - b^2)/(2*b^3) + (2*a*tan(c + d*x))/b^2)/(d*(a^2 + b^2*tan(c + d*x)
^2 + 2*a*b*tan(c + d*x))) + log(a + b*tan(c + d*x))/(b^3*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^4(c+dx)}{(a+b\tan(c+dx))^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4/(a+b*tan(d*x+c))**3,x)
```

```
[Out] Integral(sec(c + d*x)**4/(a + b*tan(c + d*x))**3, x)
```

3.569 $\int \frac{\sec^2(c+dx)}{(a+b\tan(c+dx))^3}\,dx$

Optimal. Leaf size=22

$$-\frac{1}{2bd(a+b\tan(c+dx))^2}$$

```
[Out] -1/2/b/d/(a+b*tan(d*x+c))^2
```

Rubi [A] time = 0.04, antiderivative size = 22, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {3506, 32}

$$-\frac{1}{2bd(a+b\tan(c+dx))^2}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] -1/(2*b*d*(a + b*Tan[c + d*x])^2)
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\sec^2(c+dx)}{(a+b\tan(c+dx))^3}\,dx &= \frac{\text{Subst}\left(\int \frac{1}{(a+x)^3}\,dx, x, b\tan(c+dx)\right)}{bd}\\ &= -\frac{1}{2bd(a+b\tan(c+dx))^2}\end{aligned}$$

Mathematica [B] time = 0.19, size = 58, normalized size = 2.64

$$\frac{2\tan(c+dx)(a+b\tan(c+dx))-b\sec^2(c+dx)}{2d\left(a^2+b^2\right)(a+b\tan(c+dx))^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (-(b*Sec[c + d*x]^2) + 2*Tan[c + d*x]*(a + b*Tan[c + d*x]))/(2*(a^2 + b^2)*
d*(a + b*Tan[c + d*x])^2)
```

fricas [B] time = 0.68, size = 142, normalized size = 6.45

$$-\frac{4\,a^2b\cos(dx+c)^2-a^2b+b^3-2\left(a^3-ab^2\right)\cos(dx+c)\sin(dx+c)}{2\left(\left(a^6+a^4b^2-a^2b^4-b^6\right)d\cos(dx+c)^2+2\left(a^5b+2\,a^3b^3+ab^5\right)d\cos(dx+c)\sin(dx+c)+\left(a^4b^2+2\,a^2b^4+b\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] -1/2*(4*a^2*b*cos(d*x + c)^2 - a^2*b + b^3 - 2*(a^3 - a*b^2)*cos(d*x + c)*s
in(d*x + c))/((a^6 + a^4*b^2 - a^2*b^4 - b^6)*d*cos(d*x + c)^2 + 2*(a^5*b +
 2*a^3*b^3 + a*b^5)*d*cos(d*x + c)*sin(d*x + c) + (a^4*b^2 + 2*a^2*b^4 + b^
6)*d)
```

giac [A] time = 0.89, size = 20, normalized size = 0.91

$$-\frac{1}{2\left(b\tan\left(dx+c\right)+a\right)^{2}bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -1/2/((b*tan(d*x + c) + a)^2*b*d)
```

maple [A] time = 0.34, size = 21, normalized size = 0.95

$$-\frac{1}{2bd\left(a+b\tan\left(dx+c\right)\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2/(a+b*tan(d*x+c))^3,x)
```

```
[Out] -1/2/b/d/(a+b*tan(d*x+c))^2
```

maxima [A] time = 0.32, size = 20, normalized size = 0.91

$$-\frac{1}{2\left(b\tan\left(dx+c\right)+a\right)^{2}bd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2/(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/2/((b*tan(d*x + c) + a)^2*b*d)
```

mupad [B] time = 3.66, size = 39, normalized size = 1.77

$$-\frac{1}{d\,\left(2\,a^2\,b+4\,a\,b^2\,\tan\left(c+d\,x\right)+2\,b^3\,{\tan\left(c+d\,x\right)}^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^2*(a + b*tan(c + d*x))^3),x)
```

```
[Out] -1/(d*(2*a^2*b + 2*b^3*tan(c + d*x)^2 + 4*a*b^2*tan(c + d*x)))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\sec^{2}\left(c+dx\right)}{\left(a+b\tan\left(c+dx\right)\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2/(a+b*tan(d*x+c))**3,x)
```

```
[Out] Integral(sec(c + d*x)**2/(a + b*tan(c + d*x))**3, x)
```

3.570 $\int \frac{\cos^2(c+dx)}{(a+b\tan(c+dx))^3}\,dx$

Optimal. Leaf size=202

$$\frac{ab\left(a^2-11b^2\right)}{2d\left(a^2+b^2\right)^3(a+b\tan(c+dx))}+\frac{b\left(a^2-2b^2\right)}{2d\left(a^2+b^2\right)^2(a+b\tan(c+dx))^2}+\frac{\cos^2(c+dx)(a\tan(c+dx)+b)}{2d\left(a^2+b^2\right)(a+b\tan(c+dx))^2}+\frac{2b^3\left(5a^2\right.}{}$$

```
[Out] 1/2*a*(a^4+10*a^2*b^2-15*b^4)*x/(a^2+b^2)^4+2*b^3*(5*a^2-b^2)*ln(a*cos(d*x+
c)+b*sin(d*x+c))/(a^2+b^2)^4/d+1/2*b*(a^2-2*b^2)/(a^2+b^2)^2/d/(a+b*tan(d*x
+c))^2+1/2*cos(d*x+c)^2*(b+a*tan(d*x+c))/(a^2+b^2)/d/(a+b*tan(d*x+c))^2+1/2
*a*b*(a^2-11*b^2)/(a^2+b^2)^3/d/(a+b*tan(d*x+c))
```

Rubi [A] time = 0.23, antiderivative size = 202, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {3506, 741, 801, 635, 203, 260}

$$\frac{ab\left(a^2-11b^2\right)}{2d\left(a^2+b^2\right)^3(a+b\tan(c+dx))}+\frac{b\left(a^2-2b^2\right)}{2d\left(a^2+b^2\right)^2(a+b\tan(c+dx))^2}+\frac{\cos^2(c+dx)(a\tan(c+dx)+b)}{2d\left(a^2+b^2\right)(a+b\tan(c+dx))^2}+\frac{2b^3\left(5a^2\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (a*(a^4 + 10*a^2*b^2 - 15*b^4)*x)/(2*(a^2 + b^2)^4) + (2*b^3*(5*a^2 - b^2)*
Log[a*Cos[c + d*x] + b*Sin[c + d*x]])/((a^2 + b^2)^4*d) + (b*(a^2 - 2*b^2))
/(2*(a^2 + b^2)^2*d*(a + b*Tan[c + d*x])^2) + (Cos[c + d*x]^2*(b + a*Tan[c
+ d*x]))/(2*(a^2 + b^2)*d*(a + b*Tan[c + d*x])^2) + (a*b*(a^2 - 11*b^2))/(2
*(a^2 + b^2)^3*d*(a + b*Tan[c + d*x]))
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 741

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(a*e + c*d*x)*(a + c*x^2)^(p + 1))/(2*a*(p + 1)*(c*d^2
+ a*e^2)), x] + Dist[1/(2*a*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*Simp[
c*d^2*(2*p + 3) + a*e^2*(m + 2*p + 3) + c*e*d*(m + 2*p + 4)*x, x]*(a + c*x^
2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] &&
 LtQ[p, -1] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 801

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_) + (c_.)*(x_)^2),
 x_Symbol] :> Int[ExpandIntegrand[((d + e*x)^m*(f + g*x))/(a + c*x^2), x],
```

```
x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] && IntegerQ[m]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^2(c+dx)}{(a+b\tan(c+dx))^3}\,dx = \frac{\text{Subst}\left(\int \frac{1}{(a+x)^3\left(1+\frac{x^2}{b^2}\right)^2}\,dx, x, b\tan(c+dx)\right)}{bd}$$

$$= \frac{\cos^2(c+dx)(b+a\tan(c+dx))}{2\left(a^2+b^2\right)d(a+b\tan(c+dx))^2} - \frac{b\,\text{Subst}\left(\int \frac{-4-\frac{a^2}{b^2}-\frac{3ax}{b^2}}{(a+x)^3\left(1+\frac{x^2}{b^2}\right)}\,dx, x, b\tan(c+dx)\right)}{2\left(a^2+b^2\right)d}$$

$$= \frac{\cos^2(c+dx)(b+a\tan(c+dx))}{2\left(a^2+b^2\right)d(a+b\tan(c+dx))^2} - \frac{b\,\text{Subst}\left(\int \left(\frac{2\left(a^2-2b^2\right)}{\left(a^2+b^2\right)(a+x)^3} + \frac{a^3-11ab^2}{\left(a^2+b^2\right)^2(a+x)^2} + \frac{4b^2(\ldots}{(a^2+\ldots}\right.\right.}{\ldots}$$

$$= \frac{2b^3\left(5a^2-b^2\right)\log(a+b\tan(c+dx))}{\left(a^2+b^2\right)^4 d} + \frac{b\left(a^2-2b^2\right)}{2\left(a^2+b^2\right)^2 d(a+b\tan(c+dx))^2} + \frac{\cos\ldots}{2(a\ldots}$$

$$= \frac{2b^3\left(5a^2-b^2\right)\log(a+b\tan(c+dx))}{\left(a^2+b^2\right)^4 d} + \frac{b\left(a^2-2b^2\right)}{2\left(a^2+b^2\right)^2 d(a+b\tan(c+dx))^2} + \frac{\cos\ldots}{2(a\ldots}$$

$$= \frac{a\left(a^4+10a^2b^2-15b^4\right)x}{2\left(a^2+b^2\right)^4} + \frac{2b^3\left(5a^2-b^2\right)\log(\cos(c+dx))}{\left(a^2+b^2\right)^4 d} + \frac{2b^3\left(5a^2-b^2\right)\log(\ldots}{(a^2+\ldots}$$

Mathematica [B] time = 6.28, size = 458, normalized size = 2.27

$$b^3\left(\frac{\cos^2(c+dx)\left(ab\tan(c+dx)+b^2\right)}{2b^4\left(a^2+b^2\right)(a+b\tan(c+dx))^2} - \frac{\left(2a^2-4b^2\right)\left(-\frac{2a}{\left(a^2+b^2\right)^2(a+b\tan(c+dx))} - \frac{1}{2\left(a^2+b^2\right)(a+b\tan(c+dx))^2} + \frac{\left(3a^2-b^2\right)\log(a+b\tan(c+dx))}{\left(a^2+b^2\right)^3} - \frac{\left(-\frac{a^3-3ab^2}{\sqrt{-b^2}}+3a^2-b^2\right)\text{lo}\ldots}{2(a^2+\ldots}\right.}{\ldots}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (b^3*((Cos[c + d*x]^2*(b^2 + a*b*Tan[c + d*x]))/(2*b^4*(a^2 + b^2)*(a + b*T
an[c + d*x])^2) - ((2*a^2 - 4*b^2)*(-1/2*((3*a^2 - b^2 - (a^3 - 3*a*b^2)/Sq
rt[-b^2])*Log[Sqrt[-b^2] - b*Tan[c + d*x]])/(a^2 + b^2)^3 + ((3*a^2 - b^2)*
Log[a + b*Tan[c + d*x]])/(a^2 + b^2)^3 - ((3*a^2 - b^2 + (a^3 - 3*a*b^2)/Sq
rt[-b^2])*Log[Sqrt[-b^2] + b*Tan[c + d*x]])/(2*(a^2 + b^2)^3) - 1/(2*(a^2 +
 b^2)*(a + b*Tan[c + d*x])^2) - (2*a)/((a^2 + b^2)^2*(a + b*Tan[c + d*x])))
 - 3*a*(-1/2*((2*a - (a^2 - b^2)/Sqrt[-b^2])*Log[Sqrt[-b^2] - b*Tan[c + d*x
```

```
]])/(a^2 + b^2)^2 + (2*a*Log[a + b*Tan[c + d*x]])/(a^2 + b^2)^2 - ((2*a + (
a^2 - b^2)/Sqrt[-b^2])*Log[Sqrt[-b^2] + b*Tan[c + d*x]])/(2*(a^2 + b^2)^2)
- 1/((a^2 + b^2)*(a + b*Tan[c + d*x]))))/(2*b^2*(a^2 + b^2))))/d
```

fricas [B] time = 1.12, size = 503, normalized size = 2.49

$$-\frac{3a^4b^3 - 16a^2b^5 + b^7 - 2\left(a^6b + 3a^4b^3 + 3a^2b^5 + b^7\right)\cos(dx+c)^4 - 2\left(a^5b^2 + 10a^3b^4 - 15ab^6\right)dx - \left(a^6b - a^4b\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] -1/4*(3*a^4*b^3 - 16*a^2*b^5 + b^7 - 2*(a^6*b + 3*a^4*b^3 + 3*a^2*b^5 + b^7
)*cos(d*x + c)^4 - 2*(a^5*b^2 + 10*a^3*b^4 - 15*a*b^6)*d*x - (a^6*b - a^4*b
^3 - 45*a^2*b^5 - 3*b^7 + 2*(a^7 + 9*a^5*b^2 - 25*a^3*b^4 + 15*a*b^6)*d*x)*
cos(d*x + c)^2 - 4*(5*a^2*b^5 - b^7 + (5*a^4*b^3 - 6*a^2*b^5 + b^7)*cos(d*x
 + c)^2 + 2*(5*a^3*b^4 - a*b^6)*cos(d*x + c)*sin(d*x + c))*log(2*a*b*cos(d*
x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 + b^2) - 2*((a^7 + 3*a^5*b
^2 + 3*a^3*b^4 + a*b^6)*cos(d*x + c)^3 - 2*(a^5*b^2 - 3*a^3*b^4 + 6*a*b^6 -
 (a^6*b + 10*a^4*b^3 - 15*a^2*b^5)*d*x)*cos(d*x + c))*sin(d*x + c))/((a^10
+ 3*a^8*b^2 + 2*a^6*b^4 - 2*a^4*b^6 - 3*a^2*b^8 - b^10)*d*cos(d*x + c)^2 +
2*(a^9*b + 4*a^7*b^3 + 6*a^5*b^5 + 4*a^3*b^7 + a*b^9)*d*cos(d*x + c)*sin(d*
x + c) + (a^8*b^2 + 4*a^6*b^4 + 6*a^4*b^6 + 4*a^2*b^8 + b^10)*d)
```

giac [B] time = 1.14, size = 439, normalized size = 2.17

$$\frac{\frac{\left(a^5+10a^3b^2-15ab^4\right)(dx+c)}{a^8+4a^6b^2+6a^4b^4+4a^2b^6+b^8} - \frac{2\left(5a^2b^3-b^5\right)\log\left(\tan(dx+c)^2+1\right)}{a^8+4a^6b^2+6a^4b^4+4a^2b^6+b^8} + \frac{4\left(5a^2b^4-b^6\right)\log(|b\tan(dx+c)+a|)}{a^8b+4a^6b^3+6a^4b^5+4a^2b^7+b^9} + \frac{10a^2b^3\tan(dx+c)^2-2b^5\tan(dx+c)^2+a^5\ldots}{\left(a^8+4a^6b^2\ldots\right.}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/2*((a^5 + 10*a^3*b^2 - 15*a*b^4)*(d*x + c)/(a^8 + 4*a^6*b^2 + 6*a^4*b^4 +
 4*a^2*b^6 + b^8) - 2*(5*a^2*b^3 - b^5)*log(tan(d*x + c)^2 + 1)/(a^8 + 4*a^
6*b^2 + 6*a^4*b^4 + 4*a^2*b^6 + b^8) + 4*(5*a^2*b^4 - b^6)*log(abs(b*tan(d*
x + c) + a))/(a^8*b + 4*a^6*b^3 + 6*a^4*b^5 + 4*a^2*b^7 + b^9) + (10*a^2*b^
3*tan(d*x + c)^2 - 2*b^5*tan(d*x + c)^2 + a^5*tan(d*x + c) - 2*a^3*b^2*tan(
d*x + c) - 3*a*b^4*tan(d*x + c) + 3*a^4*b + 12*a^2*b^3 - 3*b^5)/((a^8 + 4*a
^6*b^2 + 6*a^4*b^4 + 4*a^2*b^6 + b^8)*(tan(d*x + c)^2 + 1)) - (30*a^2*b^5*t
an(d*x + c)^2 - 6*b^7*tan(d*x + c)^2 + 68*a^3*b^4*tan(d*x + c) - 4*a*b^6*ta
n(d*x + c) + 39*a^4*b^3 + 4*a^2*b^5 + b^7)/((a^8 + 4*a^6*b^2 + 6*a^4*b^4 +
4*a^2*b^6 + b^8)*(b*tan(d*x + c) + a)^2))/d
```

maple [B] time = 0.52, size = 453, normalized size = 2.24

$$-\frac{b^3}{2d\left(a^2+b^2\right)^2\left(a+b\tan(dx+c)\right)^2} - \frac{4b^3a}{d\left(a^2+b^2\right)^3\left(a+b\tan(dx+c)\right)} + \frac{10b^3\ln\left(a+b\tan(dx+c)\right)a^2}{d\left(a^2+b^2\right)^4} - \frac{2b^5\ln(a+\ldots}{d\left(a\ldots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2/(a+b*tan(d*x+c))^3,x)
```

```
[Out] -1/2/d*b^3/(a^2+b^2)^2/(a+b*tan(d*x+c))^2-4/d*b^3/(a^2+b^2)^3*a/(a+b*tan(d*
x+c))+10/d*b^3/(a^2+b^2)^4*ln(a+b*tan(d*x+c))*a^2-2/d*b^5/(a^2+b^2)^4*ln(a+
b*tan(d*x+c))+1/2/d/(a^2+b^2)^4/(1+tan(d*x+c)^2)*tan(d*x+c)*a^5-1/d/(a^2+b^
2)^4/(1+tan(d*x+c)^2)*tan(d*x+c)*b^2*a^3-3/2/d/(a^2+b^2)^4/(1+tan(d*x+c)^2)
*tan(d*x+c)*a*b^4+3/2/d/(a^2+b^2)^4/(1+tan(d*x+c)^2)*a^4*b+1/d/(a^2+b^2)^4/
```

```
(1+tan(d*x+c)^2)*a^2*b^3-1/2/d/(a^2+b^2)^4/(1+tan(d*x+c)^2)*b^5-5/d/(a^2+b^
2)^4*ln(1+tan(d*x+c)^2)*a^2*b^3+1/d/(a^2+b^2)^4*ln(1+tan(d*x+c)^2)*b^5+5/d/
(a^2+b^2)^4*arctan(tan(d*x+c))*b^2*a^3-15/2/d/(a^2+b^2)^4*arctan(tan(d*x+c)
)*a*b^4+1/2/d/(a^2+b^2)^4*arctan(tan(d*x+c))*a^5
```

maxima [B] time = 0.46, size = 458, normalized size = 2.27

$$\frac{\frac{(a^5+10a^3b^2-15ab^4)(dx+c)}{a^8+4a^6b^2+6a^4b^4+4a^2b^6+b^8}+\frac{4(5a^2b^3-b^5)\log(b\tan(dx+c)+a)}{a^8+4a^6b^2+6a^4b^4+4a^2b^6+b^8}-\frac{2(5a^2b^3-b^5)\log(\tan(dx+c)^2+1)}{a^8+4a^6b^2+6a^4b^4+4a^2b^6+b^8}+\frac{\cdots}{a^8+3a^6b^2+3a^4b^4+a^2b^6+(a^6b^2+3a^4b\cdots}}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2/(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/2*((a^5 + 10*a^3*b^2 - 15*a*b^4)*(d*x + c)/(a^8 + 4*a^6*b^2 + 6*a^4*b^4 +
 4*a^2*b^6 + b^8) + 4*(5*a^2*b^3 - b^5)*log(b*tan(d*x + c) + a)/(a^8 + 4*a^
6*b^2 + 6*a^4*b^4 + 4*a^2*b^6 + b^8) - 2*(5*a^2*b^3 - b^5)*log(tan(d*x + c)
^2 + 1)/(a^8 + 4*a^6*b^2 + 6*a^4*b^4 + 4*a^2*b^6 + b^8) + (3*a^4*b - 10*a^2
*b^3 - b^5 + (a^3*b^2 - 11*a*b^4)*tan(d*x + c)^3 + 2*(a^4*b - 6*a^2*b^3 - b
^5)*tan(d*x + c)^2 + (a^5 + 3*a^3*b^2 - 10*a*b^4)*tan(d*x + c))/(a^8 + 3*a^
6*b^2 + 3*a^4*b^4 + a^2*b^6 + (a^6*b^2 + 3*a^4*b^4 + 3*a^2*b^6 + b^8)*tan(d
*x + c)^4 + 2*(a^7*b + 3*a^5*b^3 + 3*a^3*b^5 + a*b^7)*tan(d*x + c)^3 + (a^8
 + 4*a^6*b^2 + 6*a^4*b^4 + 4*a^2*b^6 + b^8)*tan(d*x + c)^2 + 2*(a^7*b + 3*a
^5*b^3 + 3*a^3*b^5 + a*b^7)*tan(d*x + c)))/d
```

mupad [B] time = 4.56, size = 419, normalized size = 2.07

$$\frac{\ln(a+b\tan(c+dx))\left(\frac{10b^3}{(a^2+b^2)^3}-\frac{12b^5}{(a^2+b^2)^4}\right)}{d}-\frac{\frac{-3a^4b+10a^2b^3+b^5}{2(a^2+b^2)(a^4+2a^2b^2+b^4)}+\frac{\tan(c+dx)^3(11ab^4-a^3b^2)}{2(a^6+3a^4b^2+3a^2b^4+b^6)}+\frac{\tan(c+dx)^2(-a^4b+6a^2b\cdots}{(a^2+b^2)(a^4+2a^2b^2+\cdots}}{d\left(\tan(c+dx)^2(a^2+b^2)+a^2+b^2\tan(c+dx)^4+2ab\tan(\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2/(a + b*tan(c + d*x))^3,x)
```

```
[Out] (log(a + b*tan(c + d*x))*((10*b^3)/(a^2 + b^2)^3 - (12*b^5)/(a^2 + b^2)^4))
/d - ((b^5 - 3*a^4*b + 10*a^2*b^3)/(2*(a^2 + b^2)*(a^4 + b^4 + 2*a^2*b^2))
+ (tan(c + d*x)^3*(11*a*b^4 - a^3*b^2))/(2*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b
^2)) + (tan(c + d*x)^2*(b^5 - a^4*b + 6*a^2*b^3))/((a^2 + b^2)*(a^4 + b^4 +
 2*a^2*b^2)) - (a*tan(c + d*x)*(a^4 - 10*b^4 + 3*a^2*b^2))/(2*(a^2 + b^2)*(
a^4 + b^4 + 2*a^2*b^2)))/(d*(tan(c + d*x)^2*(a^2 + b^2) + a^2 + b^2*tan(c +
 d*x)^4 + 2*a*b*tan(c + d*x) + 2*a*b*tan(c + d*x)^3)) + (log(tan(c + d*x) +
 1i)*((a*1i)/4 + b))/(d*(a*b^3*4i - a^3*b*4i + a^4 + b^4 - 6*a^2*b^2)) + (l
og(tan(c + d*x) - 1i)*(a + b*4i))/(4*d*(4*a*b^3 - 4*a^3*b + a^4*1i + b^4*1i
 - a^2*b^2*6i))
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: AttributeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2/(a+b*tan(d*x+c))**3,x)
```

```
[Out] Exception raised: AttributeError
```

3.571 $\int \frac{\cos^4(c+dx)}{(a+b\tan(c+dx))^3}\,dx$

Optimal. Leaf size=295

$$\frac{\cos^4(c+dx)(a\tan(c+dx)+b)}{4d\left(a^2+b^2\right)(a+b\tan(c+dx))^2}-\frac{\cos^2(c+dx)\left(2b\left(a^2-3b^2\right)-a\left(3a^2+11b^2\right)\tan(c+dx)\right)}{8d\left(a^2+b^2\right)^2(a+b\tan(c+dx))^2}+\frac{3b^5\left(7a^2-b^2\right)\log(a}{d}$$

```
[Out] 3/8*a*(a^6+7*a^4*b^2+35*a^2*b^4-35*b^6)*x/(a^2+b^2)^5+3*b^5*(7*a^2-b^2)*ln(
a*cos(d*x+c)+b*sin(d*x+c))/(a^2+b^2)^5/d+3/8*b*(a^4+5*a^2*b^2-4*b^4)/(a^2+b
^2)^3/d/(a+b*tan(d*x+c))^2+1/4*cos(d*x+c)^4*(b+a*tan(d*x+c))/(a^2+b^2)/d/(a
+b*tan(d*x+c))^2+3/8*a*b*(a^4+6*a^2*b^2-27*b^4)/(a^2+b^2)^4/d/(a+b*tan(d*x+
c))-1/8*cos(d*x+c)^2*(2*b*(a^2-3*b^2)-a*(3*a^2+11*b^2)*tan(d*x+c))/(a^2+b^2
)^2/d/(a+b*tan(d*x+c))^2
```

Rubi [A] time = 0.35, antiderivative size = 295, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {3506, 741, 823, 801, 635, 203, 260}

$$\frac{3ab\left(6a^2b^2+a^4-27b^4\right)}{8d\left(a^2+b^2\right)^4(a+b\tan(c+dx))}+\frac{3b\left(5a^2b^2+a^4-4b^4\right)}{8d\left(a^2+b^2\right)^3(a+b\tan(c+dx))^2}-\frac{\cos^2(c+dx)\left(2b\left(a^2-3b^2\right)-a\left(3a^2+11b^2\right)\right.}{8d\left(a^2+b^2\right)^2(a+b\tan(c+dx)}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (3*a*(a^6 + 7*a^4*b^2 + 35*a^2*b^4 - 35*b^6)*x)/(8*(a^2 + b^2)^5) + (3*b^5*
(7*a^2 - b^2)*Log[a*Cos[c + d*x] + b*Sin[c + d*x]])/((a^2 + b^2)^5*d) + (3*
b*(a^4 + 5*a^2*b^2 - 4*b^4))/(8*(a^2 + b^2)^3*d*(a + b*Tan[c + d*x])^2) + (
Cos[c + d*x]^4*(b + a*Tan[c + d*x]))/(4*(a^2 + b^2)*d*(a + b*Tan[c + d*x])^
2) + (3*a*b*(a^4 + 6*a^2*b^2 - 27*b^4))/(8*(a^2 + b^2)^4*d*(a + b*Tan[c + d
*x])) - (Cos[c + d*x]^2*(2*b*(a^2 - 3*b^2) - a*(3*a^2 + 11*b^2)*Tan[c + d*x
]))/(8*(a^2 + b^2)^2*d*(a + b*Tan[c + d*x])^2)
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 741

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(a*e + c*d*x)*(a + c*x^2)^(p + 1))/(2*a*(p + 1)*(c*d^2
+ a*e^2)), x] + Dist[1/(2*a*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*Simp[
c*d^2*(2*p + 3) + a*e^2*(m + 2*p + 3) + c*e*d*(m + 2*p + 4)*x, x]*(a + c*x^
2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] &&
 LtQ[p, -1] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 801

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_) + (c_.)*(x_)^2),
 x_Symbol] :> Int[ExpandIntegrand[((d + e*x)^m*(f + g*x))/(a + c*x^2), x],
x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] && IntegerQ[m]
```

Rule 823

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_), x_Symbol] :> -Simp[((d + e*x)^(m + 1)*(f*a*c*e - a*g*c*d + c*(c*d*f + a
*e*g)*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)*(c*d^2 + a*e^2)), x] + Dist[1/
(2*a*c*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*(a + c*x^2)^(p + 1)*Simp[f
*(c^2*d^2*(2*p + 3) + a*c*e^2*(m + 2*p + 3)) - a*c*d*e*g*m + c*e*(c*d*f + a
*e*g)*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*
d^2 + a*e^2, 0] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2
*m, 2*p])
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^4(c+dx)}{(a+b\tan(c+dx))^3}\,dx = \frac{\text{Subst}\left(\int \frac{1}{(a+x)^3\left(1+\frac{x^2}{b^2}\right)^3}\,dx, x, b\tan(c+dx)\right)}{bd}$$

$$= \frac{\cos^4(c+dx)(b+a\tan(c+dx))}{4\left(a^2+b^2\right)d(a+b\tan(c+dx))^2} - \frac{b\,\text{Subst}\left(\int \frac{-3\left(2+\frac{a^2}{b^2}\right)-\frac{5ax}{b^2}}{(a+x)^3\left(1+\frac{x^2}{b^2}\right)^2}\,dx, x, b\tan(c+dx)\right)}{4\left(a^2+b^2\right)d}$$

$$= \frac{\cos^4(c+dx)(b+a\tan(c+dx))}{4\left(a^2+b^2\right)d(a+b\tan(c+dx))^2} - \frac{\cos^2(c+dx)\left(2b\left(a^2-3b^2\right)-a\left(3a^2+11b^2\right)\text{t}\right.}{8\left(a^2+b^2\right)^2d(a+b\tan(c+dx))^2}$$

$$= \frac{\cos^4(c+dx)(b+a\tan(c+dx))}{4\left(a^2+b^2\right)d(a+b\tan(c+dx))^2} - \frac{\cos^2(c+dx)\left(2b\left(a^2-3b^2\right)-a\left(3a^2+11b^2\right)\text{t}\right.}{8\left(a^2+b^2\right)^2d(a+b\tan(c+dx))^2}$$

$$= \frac{3b^5\left(7a^2-b^2\right)\log(a+b\tan(c+dx))}{\left(a^2+b^2\right)^5d} + \frac{3b\left(a^4+5a^2b^2-4b^4\right)}{8\left(a^2+b^2\right)^3d(a+b\tan(c+dx))^2} + \frac{\cos}{4\left(a\right.}$$

$$= \frac{3b^5\left(7a^2-b^2\right)\log(a+b\tan(c+dx))}{\left(a^2+b^2\right)^5d} + \frac{3b\left(a^4+5a^2b^2-4b^4\right)}{8\left(a^2+b^2\right)^3d(a+b\tan(c+dx))^2} + \frac{\cos}{4\left(a\right.}$$

$$= \frac{3a\left(a^6+7a^4b^2+35a^2b^4-35b^6\right)x}{8\left(a^2+b^2\right)^5} + \frac{3b^5\left(7a^2-b^2\right)\log(\cos(c+dx))}{\left(a^2+b^2\right)^5d} + \frac{3b^5\left(7a^2\right.}{}$$

Mathematica [B] time = 6.29, size = 596, normalized size = 2.02

$$b^5\left(\frac{\cos^4(c+dx)\left(ab\tan(c+dx)+b^2\right)}{4b^6\left(a^2+b^2\right)(a+b\tan(c+dx))^2}-\frac{\frac{\cos^2(c+dx)\left(b\left(-3a\left(a^2+2b^2\right)-5ab^2\right)\tan(c+dx)+5a^2b^2-3b^2\left(a^2+2b^2\right)\right)}{2b^4\left(a^2+b^2\right)(a+b\tan(c+dx))^2}-\frac{3a\left(3a^2+11b^2\right)\left(-\frac{1}{\left(a^2+b^2\right)(a+b\tan(c+dx))}-\frac{\left(2a-\frac{a^2-b^2}{\sqrt{-b^2}}\right)\log(}{2(a^2}\right.}{}}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (b^5*((Cos[c + d*x]^4*(b^2 + a*b*Tan[c + d*x]))/(4*b^6*(a^2 + b^2)*(a + b*T
an[c + d*x])^2) - ((Cos[c + d*x]^2*(5*a^2*b^2 - 3*b^2*(a^2 + 2*b^2) + b*(-5
*a*b^2 - 3*a*(a^2 + 2*b^2))*Tan[c + d*x]))/(2*b^4*(a^2 + b^2)*(a + b*Tan[c
+ d*x])^2) - ((-3*a^2*(3*a^2 + 11*b^2) + 3*(a^4 + a^2*b^2 + 8*b^4))*(-1/2*(
(3*a^2 - b^2 - (a^3 - 3*a*b^2)/Sqrt[-b^2])*Log[Sqrt[-b^2] - b*Tan[c + d*x]]
)/(a^2 + b^2)^3 + ((3*a^2 - b^2)*Log[a + b*Tan[c + d*x]])/(a^2 + b^2)^3 - (
(3*a^2 - b^2 + (a^3 - 3*a*b^2)/Sqrt[-b^2])*Log[Sqrt[-b^2] + b*Tan[c + d*x]]
)/(2*(a^2 + b^2)^3) - 1/(2*(a^2 + b^2)*(a + b*Tan[c + d*x])^2) - (2*a)/((a^
2 + b^2)^2*(a + b*Tan[c + d*x]))) + 3*a*(3*a^2 + 11*b^2)*(-1/2*((2*a - (a^2
 - b^2)/Sqrt[-b^2])*Log[Sqrt[-b^2] - b*Tan[c + d*x]])/(a^2 + b^2)^2 + (2*a*
Log[a + b*Tan[c + d*x]])/(a^2 + b^2)^2 - ((2*a + (a^2 - b^2)/Sqrt[-b^2])*Lo
g[Sqrt[-b^2] + b*Tan[c + d*x]])/(2*(a^2 + b^2)^2) - 1/((a^2 + b^2)*(a + b*T
an[c + d*x]))))/(2*b^2*(a^2 + b^2)))/(4*b^2*(a^2 + b^2))))/d
```

fricas [B] time = 0.88, size = 671, normalized size = 2.27

$$-\frac{9\,a^6b^3+95\,a^4b^5-141\,a^2b^7-3\,b^9-8\left(a^8b+4\,a^6b^3+6\,a^4b^5+4\,a^2b^7+b^9\right)\cos\left(dx+c\right)^6+8\left(a^8b-6\,a^4b^5-8\,a^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] -1/32*(9*a^6*b^3 + 95*a^4*b^5 - 141*a^2*b^7 - 3*b^9 - 8*(a^8*b + 4*a^6*b^3
+ 6*a^4*b^5 + 4*a^2*b^7 + b^9)*cos(d*x + c)^6 + 8*(a^8*b - 6*a^4*b^5 - 8*a^
2*b^7 - 3*b^9)*cos(d*x + c)^4 - 12*(a^7*b^2 + 7*a^5*b^4 + 35*a^3*b^6 - 35*a
*b^8)*d*x - (15*a^8*b + 82*a^6*b^3 + 68*a^4*b^5 - 498*a^2*b^7 - 51*b^9 + 12
*(a^9 + 6*a^7*b^2 + 28*a^5*b^4 - 70*a^3*b^6 + 35*a*b^8)*d*x)*cos(d*x + c)^2
 - 48*(7*a^2*b^7 - b^9 + (7*a^4*b^5 - 8*a^2*b^7 + b^9)*cos(d*x + c)^2 + 2*(
7*a^3*b^6 - a*b^8)*cos(d*x + c)*sin(d*x + c))*log(2*a*b*cos(d*x + c)*sin(d*
x + c) + (a^2 - b^2)*cos(d*x + c)^2 + b^2) - 2*(4*(a^9 + 4*a^7*b^2 + 6*a^5*
b^4 + 4*a^3*b^6 + a*b^8)*cos(d*x + c)^5 + 2*(3*a^9 + 20*a^7*b^2 + 42*a^5*b^
4 + 36*a^3*b^6 + 11*a*b^8)*cos(d*x + c)^3 - (3*a^7*b^2 + 53*a^5*b^4 - 15*a^
3*b^6 + 159*a*b^8 - 12*(a^8*b + 7*a^6*b^3 + 35*a^4*b^5 - 35*a^2*b^7)*d*x)*c
os(d*x + c))*sin(d*x + c))/((a^12 + 4*a^10*b^2 + 5*a^8*b^4 - 5*a^4*b^8 - 4*
a^2*b^10 - b^12)*d*cos(d*x + c)^2 + 2*(a^11*b + 5*a^9*b^3 + 10*a^7*b^5 + 10
*a^5*b^7 + 5*a^3*b^9 + a*b^11)*d*cos(d*x + c)*sin(d*x + c) + (a^10*b^2 + 5*
a^8*b^4 + 10*a^6*b^6 + 10*a^4*b^8 + 5*a^2*b^10 + b^12)*d)
```

giac [B] time = 1.33, size = 587, normalized size = 1.99

$$\frac{\frac{3\left(a^7+7\,a^5b^2+35\,a^3b^4-35\,ab^6\right)(dx+c)}{a^{10}+5\,a^8b^2+10\,a^6b^4+10\,a^4b^6+5\,a^2b^8+b^{10}}-\frac{12\left(7\,a^2b^5-b^7\right)\log\left(\tan(dx+c)^2+1\right)}{a^{10}+5\,a^8b^2+10\,a^6b^4+10\,a^4b^6+5\,a^2b^8+b^{10}}+\frac{24\left(7\,a^2b^6-b^8\right)\log(|b\tan(dx+c)+a|)}{a^{10}b+5\,a^8b^3+10\,a^6b^5+10\,a^4b^7+5\,a^2b^9+b^{11}}+\frac{3\,a^5b^2\tan(}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] 1/8*(3*(a^7 + 7*a^5*b^2 + 35*a^3*b^4 - 35*a*b^6)*(d*x + c)/(a^10 + 5*a^8*b^
2 + 10*a^6*b^4 + 10*a^4*b^6 + 5*a^2*b^8 + b^10) - 12*(7*a^2*b^5 - b^7)*log(
tan(d*x + c)^2 + 1)/(a^10 + 5*a^8*b^2 + 10*a^6*b^4 + 10*a^4*b^6 + 5*a^2*b^8
 + b^10) + 24*(7*a^2*b^6 - b^8)*log(abs(b*tan(d*x + c) + a))/(a^10*b + 5*a^
8*b^3 + 10*a^6*b^5 + 10*a^4*b^7 + 5*a^2*b^9 + b^11) + (3*a^5*b^2*tan(d*x +
c)^5 + 18*a^3*b^4*tan(d*x + c)^5 - 81*a*b^6*tan(d*x + c)^5 + 6*a^6*b*tan(d*
x + c)^4 + 36*a^4*b^3*tan(d*x + c)^4 - 78*a^2*b^5*tan(d*x + c)^4 - 12*b^7*t
an(d*x + c)^4 + 3*a^7*tan(d*x + c)^3 + 23*a^5*b^2*tan(d*x + c)^3 + 61*a^3*b
^4*tan(d*x + c)^3 - 151*a*b^6*tan(d*x + c)^3 + 10*a^6*b*tan(d*x + c)^2 + 74
*a^4*b^3*tan(d*x + c)^2 - 146*a^2*b^5*tan(d*x + c)^2 - 18*b^7*tan(d*x + c)^
2 + 5*a^7*tan(d*x + c) + 26*a^5*b^2*tan(d*x + c) + 49*a^3*b^4*tan(d*x + c)
- 68*a*b^6*tan(d*x + c) + 6*a^6*b + 44*a^4*b^3 - 62*a^2*b^5 - 4*b^7)/((a^8
+ 4*a^6*b^2 + 6*a^4*b^4 + 4*a^2*b^6 + b^8)*(b*tan(d*x + c)^3 + a*tan(d*x +
c)^2 + b*tan(d*x + c) + a)^2))/d
```

maple [B] time = 0.57, size = 824, normalized size = 2.79

$$-\frac{15\left(\tan^{3}\left(dx+c\right)\right)a^{3}b^{4}}{8d\left(a^{2}+b^{2}\right)^{5}\left(1+\tan^{2}\left(dx+c\right)\right)^{2}}+\frac{3\arctan\left(\tan\left(dx+c\right)\right)a^{7}}{8d\left(a^{2}+b^{2}\right)^{5}}-\frac{b^{5}}{2d\left(a^{2}+b^{2}\right)^{3}\left(a+b\tan\left(dx+c\right)\right)^{2}}+\frac{21\arctan}{8d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4/(a+b*tan(d*x+c))^3,x)
```

```
[Out] -15/8/d/(a^2+b^2)^5/(1+tan(d*x+c)^2)^2*tan(d*x+c)^3*a^3*b^4+4/d/(a^2+b^2)^5
/(1+tan(d*x+c)^2)^2*tan(d*x+c)^2*a^2*b^5+19/8/d/(a^2+b^2)^5/(1+tan(d*x+c)^2
)^2*tan(d*x+c)*a^5*b^2-39/8/d/(a^2+b^2)^5/(1+tan(d*x+c)^2)^2*tan(d*x+c)*a*b
^6-25/8/d/(a^2+b^2)^5/(1+tan(d*x+c)^2)^2*tan(d*x+c)*a^3*b^4+5/d/(a^2+b^2)^5
/(1+tan(d*x+c)^2)^2*tan(d*x+c)^2*a^4*b^3-33/8/d/(a^2+b^2)^5/(1+tan(d*x+c)^2
)^2*tan(d*x+c)^3*a*b^6+3/8/d/(a^2+b^2)^5*arctan(tan(d*x+c))*a^7-1/2/d*b^5/(
a^2+b^2)^3/(a+b*tan(d*x+c))^2+3/8/d/(a^2+b^2)^5/(1+tan(d*x+c)^2)^2*tan(d*x+
c)^3*a^7-1/d/(a^2+b^2)^5/(1+tan(d*x+c)^2)^2*tan(d*x+c)^2*b^7+5/8/d/(a^2+b^2
)^5/(1+tan(d*x+c)^2)^2*tan(d*x+c)*a^7+3/4/d/(a^2+b^2)^5/(1+tan(d*x+c)^2)^2*
a^6*b+21/8/d/(a^2+b^2)^5*arctan(tan(d*x+c))*a^5*b^2-6/d*b^5/(a^2+b^2)^4*a/(
a+b*tan(d*x+c))+21/d*b^5/(a^2+b^2)^5*ln(a+b*tan(d*x+c))*a^2-21/2/d/(a^2+b^2
)^5*ln(1+tan(d*x+c)^2)*a^2*b^5-3/d*b^7/(a^2+b^2)^5*ln(a+b*tan(d*x+c))-5/4/d
/(a^2+b^2)^5/(1+tan(d*x+c)^2)^2*b^7+3/2/d/(a^2+b^2)^5*ln(1+tan(d*x+c)^2)*b^
7+105/8/d/(a^2+b^2)^5*arctan(tan(d*x+c))*a^3*b^4-105/8/d/(a^2+b^2)^5*arctan
(tan(d*x+c))*a*b^6+17/4/d/(a^2+b^2)^5/(1+tan(d*x+c)^2)^2*a^2*b^5+25/4/d/(a^
2+b^2)^5/(1+tan(d*x+c)^2)^2*a^4*b^3+21/8/d/(a^2+b^2)^5/(1+tan(d*x+c)^2)^2*t
an(d*x+c)^3*a^5*b^2
```

maxima [B] time = 0.46, size = 738, normalized size = 2.50

$$\frac{\frac{3\left(a^{7}+7a^{5}b^{2}+35a^{3}b^{4}-35ab^{6}\right)(dx+c)}{a^{10}+5a^{8}b^{2}+10a^{6}b^{4}+10a^{4}b^{6}+5a^{2}b^{8}+b^{10}}+\frac{24\left(7a^{2}b^{5}-b^{7}\right)\log(b\tan(dx+c)+a)}{a^{10}+5a^{8}b^{2}+10a^{6}b^{4}+10a^{4}b^{6}+5a^{2}b^{8}+b^{10}}-\frac{12\left(7a^{2}b^{5}-b^{7}\right)\log\left(\tan(dx+c)^{2}+1\right)}{a^{10}+5a^{8}b^{2}+10a^{6}b^{4}+10a^{4}b^{6}+5a^{2}b^{8}+b^{10}}+\frac{}{a^{10}+4a^{8}}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4/(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/8*(3*(a^7 + 7*a^5*b^2 + 35*a^3*b^4 - 35*a*b^6)*(d*x + c)/(a^10 + 5*a^8*b^
2 + 10*a^6*b^4 + 10*a^4*b^6 + 5*a^2*b^8 + b^10) + 24*(7*a^2*b^5 - b^7)*log(
b*tan(d*x + c) + a)/(a^10 + 5*a^8*b^2 + 10*a^6*b^4 + 10*a^4*b^6 + 5*a^2*b^8
 + b^10) - 12*(7*a^2*b^5 - b^7)*log(tan(d*x + c)^2 + 1)/(a^10 + 5*a^8*b^2 +
 10*a^6*b^4 + 10*a^4*b^6 + 5*a^2*b^8 + b^10) + (6*a^6*b + 44*a^4*b^3 - 62*a
^2*b^5 - 4*b^7 + 3*(a^5*b^2 + 6*a^3*b^4 - 27*a*b^6)*tan(d*x + c)^5 + 6*(a^6
*b + 6*a^4*b^3 - 13*a^2*b^5 - 2*b^7)*tan(d*x + c)^4 + (3*a^7 + 23*a^5*b^2 +
```

```
61*a^3*b^4 - 151*a*b^6)*tan(d*x + c)^3 + 2*(5*a^6*b + 37*a^4*b^3 - 73*a^2*
b^5 - 9*b^7)*tan(d*x + c)^2 + (5*a^7 + 26*a^5*b^2 + 49*a^3*b^4 - 68*a*b^6)*
tan(d*x + c))/(a^10 + 4*a^8*b^2 + 6*a^6*b^4 + 4*a^4*b^6 + a^2*b^8 + (a^8*b^
2 + 4*a^6*b^4 + 6*a^4*b^6 + 4*a^2*b^8 + b^10)*tan(d*x + c)^6 + 2*(a^9*b + 4
*a^7*b^3 + 6*a^5*b^5 + 4*a^3*b^7 + a*b^9)*tan(d*x + c)^5 + (a^10 + 6*a^8*b^
2 + 14*a^6*b^4 + 16*a^4*b^6 + 9*a^2*b^8 + 2*b^10)*tan(d*x + c)^4 + 4*(a^9*b
 + 4*a^7*b^3 + 6*a^5*b^5 + 4*a^3*b^7 + a*b^9)*tan(d*x + c)^3 + (2*a^10 + 9*
a^8*b^2 + 16*a^6*b^4 + 14*a^4*b^6 + 6*a^2*b^8 + b^10)*tan(d*x + c)^2 + 2*(a
^9*b + 4*a^7*b^3 + 6*a^5*b^5 + 4*a^3*b^7 + a*b^9)*tan(d*x + c)))/d
```

mupad [B] time = 5.43, size = 715, normalized size = 2.42

$$\frac{\frac{3\,a^6\,b+22\,a^4\,b^3-31\,a^2\,b^5-2\,b^7}{4\,\left(a^8+4\,a^6\,b^2+6\,a^4\,b^4+4\,a^2\,b^6+b^8\right)}+\frac{\tan(c+d\,x)\,\left(5\,a^7+26\,a^5\,b^2+49\,a^3\,b^4-68\,a\,b^6\right)}{8\,\left(a^8+4\,a^6\,b^2+6\,a^4\,b^4+4\,a^2\,b^6+b^8\right)}+\frac{3\,\tan(c+d\,x)^5\,\left(a^5\,b^2+6\,a^3\,b^4-27\,a\,b^6\right)}{8\,\left(a^8+4\,a^6\,b^2+6\,a^4\,b^4+4\,a^2\,b^6+b^8\right)}+\frac{\tan(c+d\,x)^3\,\left(3\,a^7+23\,a\right.}{8\,\left(a^8+4\,a^6\,b^2+6\right.}}{d\,\left(\tan\left(c+d\,x\right)^2\,\left(2\,a^2+b^2\right)+\tan\left(c+d\,x\right)^4\,\left(a^2+2\,b^2\right)+a^2+b^2\,\tan\left(c+d\,x\right)^6+2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4/(a + b*tan(c + d*x))^3,x)
```

```
[Out] ((3*a^6*b - 2*b^7 - 31*a^2*b^5 + 22*a^4*b^3)/(4*(a^8 + b^8 + 4*a^2*b^6 + 6*
a^4*b^4 + 4*a^6*b^2)) + (tan(c + d*x)*(5*a^7 - 68*a*b^6 + 49*a^3*b^4 + 26*a
^5*b^2))/(8*(a^8 + b^8 + 4*a^2*b^6 + 6*a^4*b^4 + 4*a^6*b^2)) + (3*tan(c + d
*x)^5*(6*a^3*b^4 - 27*a*b^6 + a^5*b^2))/(8*(a^8 + b^8 + 4*a^2*b^6 + 6*a^4*b
^4 + 4*a^6*b^2)) + (tan(c + d*x)^3*(3*a^7 - 151*a*b^6 + 61*a^3*b^4 + 23*a^5
*b^2))/(8*(a^8 + b^8 + 4*a^2*b^6 + 6*a^4*b^4 + 4*a^6*b^2)) + (3*tan(c + d*x
)^4*(a^6*b - 2*b^7 - 13*a^2*b^5 + 6*a^4*b^3))/(4*(a^8 + b^8 + 4*a^2*b^6 + 6
*a^4*b^4 + 4*a^6*b^2)) + (tan(c + d*x)^2*(5*a^6*b - 9*b^7 - 73*a^2*b^5 + 37
*a^4*b^3))/(4*(a^8 + b^8 + 4*a^2*b^6 + 6*a^4*b^4 + 4*a^6*b^2)))/(d*(tan(c +
 d*x)^2*(2*a^2 + b^2) + tan(c + d*x)^4*(a^2 + 2*b^2) + a^2 + b^2*tan(c + d*
x)^6 + 2*a*b*tan(c + d*x) + 4*a*b*tan(c + d*x)^3 + 2*a*b*tan(c + d*x)^5)) +
 (log(a + b*tan(c + d*x))*((21*b^5)/(a^2 + b^2)^4 - (24*b^7)/(a^2 + b^2)^5)
)/d + (3*log(tan(c + d*x) - 1i)*(5*a*b - a^2*1i + b^2*8i))/(16*d*(5*a*b^4 +
 a^4*b*5i + a^5 + b^5*1i - a^2*b^3*10i - 10*a^3*b^2)) + (3*log(tan(c + d*x)
 + 1i)*(5*a*b + a^2*1i - b^2*8i))/(16*d*(5*a*b^4 - a^4*b*5i + a^5 - b^5*1i
+ a^2*b^3*10i - 10*a^3*b^2))
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: AttributeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4/(a+b*tan(d*x+c))**3,x)
```

```
[Out] Exception raised: AttributeError
```

3.572 $\int \frac{\sec^7(c+dx)}{(a+b\tan(c+dx))^3} dx$

Optimal. Leaf size=239

$$-\frac{5\sqrt{a^2+b^2}\left(4a^2+b^2\right)\sec(c+dx)\tanh^{-1}\left(\frac{b-a\tan(c+dx)}{\sqrt{a^2+b^2}\sqrt{\sec^2(c+dx)}}\right)}{2b^6d\sqrt{\sec^2(c+dx)}}-\frac{5a\left(4a^2+3b^2\right)\sec(c+dx)\sinh^{-1}(\tan(c+dx)}{2b^6d\sqrt{\sec^2(c+dx)}}$$

```
[Out] -5/2*a*(4*a^2+3*b^2)*arcsinh(tan(d*x+c))*sec(d*x+c)/b^6/d/(sec(d*x+c)^2)^(1
/2)-5/2*(4*a^2+b^2)*arctanh((b-a*tan(d*x+c))/(a^2+b^2)^(1/2)/(sec(d*x+c)^2)
^(1/2))*sec(d*x+c)*(a^2+b^2)^(1/2)/b^6/d/(sec(d*x+c)^2)^(1/2)-1/2*sec(d*x+c
)^5/b/d/(a+b*tan(d*x+c))^2+5/6*sec(d*x+c)^3*(4*a+b*tan(d*x+c))/b^3/d/(a+b*t
an(d*x+c))+5/2*sec(d*x+c)*(4*a^2+b^2-2*a*b*tan(d*x+c))/b^5/d
```

Rubi [A] time = 0.24, antiderivative size = 239, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.381$, Rules used = {3512, 733, 813, 815, 844, 215, 725, 206}

$$\frac{5\sec(c+dx)\left(4a^2-2ab\tan(c+dx)+b^2\right)}{2b^5d}-\frac{5\sqrt{a^2+b^2}\left(4a^2+b^2\right)\sec(c+dx)\tanh^{-1}\left(\frac{b-a\tan(c+dx)}{\sqrt{a^2+b^2}\sqrt{\sec^2(c+dx)}}\right)}{2b^6d\sqrt{\sec^2(c+dx)}}-\frac{5a(}{}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^7/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (-5*a*(4*a^2 + 3*b^2)*ArcSinh[Tan[c + d*x]]*Sec[c + d*x])/(2*b^6*d*Sqrt[Sec
[c + d*x]^2]) - (5*Sqrt[a^2 + b^2]*(4*a^2 + b^2)*ArcTanh[(b - a*Tan[c + d*x
])/(Sqrt[a^2 + b^2]*Sqrt[Sec[c + d*x]^2])]*Sec[c + d*x])/(2*b^6*d*Sqrt[Sec[
c + d*x]^2]) - Sec[c + d*x]^5/(2*b*d*(a + b*Tan[c + d*x])^2) + (5*Sec[c + d
*x]^3*(4*a + b*Tan[c + d*x]))/(6*b^3*d*(a + b*Tan[c + d*x])) + (5*Sec[c + d
*x]*(4*a^2 + b^2 - 2*a*b*Tan[c + d*x]))/(2*b^5*d)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 725

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 733

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m + 1)*(a + c*x^2)^p)/(e*(m + 1)), x] - Dist[(2*c*p)/(e*(m + 1)
), Int[x*(d + e*x)^(m + 1)*(a + c*x^2)^(p - 1), x], x] /; FreeQ[{a, c, d, e
, m}, x] && NeQ[c*d^2 + a*e^2, 0] && GtQ[p, 0] && (IntegerQ[p] || LtQ[m, -1
]) && NeQ[m, -1] &&  !ILtQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e,
m, p, x]
```

Rule 813

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(e*f*(m + 2*p + 2) - d*g*(2*p + 1
) + e*g*(m + 1)*x)*(a + c*x^2)^p)/(e^2*(m + 1)*(m + 2*p + 2)), x] + Dist[p/
(e^2*(m + 1)*(m + 2*p + 2)), Int[(d + e*x)^(m + 1)*(a + c*x^2)^(p - 1)*Simp
[g*(2*a*e + 2*a*e*m) + (g*(2*c*d + 4*c*d*p) - 2*c*e*f*(m + 2*p + 2))*x, x],
 x], x] /; FreeQ[{a, c, d, e, f, g, m}, x] && NeQ[c*d^2 + a*e^2, 0] && Rati
onalQ[p] && p > 0 && (LtQ[m, -1] || EqQ[p, 1] || (IntegerQ[p] &&  !Rational
Q[m])) && NeQ[m, -1] &&  !ILtQ[m + 2*p + 1, 0] && (IntegerQ[m] || IntegerQ[
p] || IntegersQ[2*m, 2*p])
```

Rule 815

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(c*e*f*(m + 2*p + 2) - g*c*d*(2*p
 + 1) + g*c*e*(m + 2*p + 1)*x)*(a + c*x^2)^p)/(c*e^2*(m + 2*p + 1)*(m + 2*p
 + 2)), x] + Dist[(2*p)/(c*e^2*(m + 2*p + 1)*(m + 2*p + 2)), Int[(d + e*x)^
m*(a + c*x^2)^(p - 1)*Simp[f*a*c*e^2*(m + 2*p + 2) + a*c*d*e*g*m - (c^2*f*d
*e*(m + 2*p + 2) - g*(c^2*d^2*(2*p + 1) + a*c*e^2*(m + 2*p + 1)))*x, x], x]
, x] /; FreeQ[{a, c, d, e, f, g, m}, x] && NeQ[c*d^2 + a*e^2, 0] && GtQ[p,
0] && (IntegerQ[p] ||  !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 0])) &&  !ILt
Q[m + 2*p, 0] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*p])
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\sec^7(c+dx)}{(a+b\tan(c+dx))^3}\,dx = \frac{\sec(c+dx)\,\text{Subst}\left(\int \frac{\left(1+\frac{x^2}{b^2}\right)^{5/2}}{(a+x)^3}\,dx, x, b\tan(c+dx)\right)}{bd\sqrt{\sec^2(c+dx)}}$$

$$= -\frac{\sec^5(c+dx)}{2bd(a+b\tan(c+dx))^2} + \frac{(5\sec(c+dx))\,\text{Subst}\left(\int \frac{x\left(1+\frac{x^2}{b^2}\right)^{3/2}}{(a+x)^2}\,dx, x, b\tan(c+dx\right.}{2b^3d\sqrt{\sec^2(c+dx)}}$$

$$= -\frac{\sec^5(c+dx)}{2bd(a+b\tan(c+dx))^2} + \frac{5\sec^3(c+dx)(4a+b\tan(c+dx))}{6b^3d(a+b\tan(c+dx))} - \frac{(5\sec(c+dx))\,\text{S}}{}$$

$$= -\frac{\sec^5(c+dx)}{2bd(a+b\tan(c+dx))^2} + \frac{5\sec^3(c+dx)(4a+b\tan(c+dx))}{6b^3d(a+b\tan(c+dx))} + \frac{5\sec(c+dx)\left(4\right.}{}$$

$$= -\frac{\sec^5(c+dx)}{2bd(a+b\tan(c+dx))^2} + \frac{5\sec^3(c+dx)(4a+b\tan(c+dx))}{6b^3d(a+b\tan(c+dx))} + \frac{5\sec(c+dx)\left(4\right.}{}$$

$$= -\frac{5a\left(4a^2+3b^2\right)\sinh^{-1}(\tan(c+dx))\sec(c+dx)}{2b^6d\sqrt{\sec^2(c+dx)}} - \frac{\sec^5(c+dx)}{2bd(a+b\tan(c+dx))^2} + \frac{5\,\text{s}}{}$$

$$= -\frac{5a\left(4a^2+3b^2\right)\sinh^{-1}(\tan(c+dx))\sec(c+dx)}{2b^6d\sqrt{\sec^2(c+dx)}} - \frac{5\sqrt{a^2+b^2}\left(4a^2+b^2\right)\tanh^{-1}}{2b^6d\sqrt{\text{se}}}$$

Mathematica [C] time = 2.48, size = 688, normalized size = 2.88

$$\frac{\sec^3(c+dx)(a\cos(c+dx)+b\sin(c+dx))\left(\frac{6b^2\left(a^2+b^2\right)^2\sin(c+dx)}{a} + 2b\left(36a^2+13b^2\right)(a\cos(c+dx)+b\sin(c+d\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^7/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (Sec[c + d*x]^3*(a*Cos[c + d*x] + b*Sin[c + d*x])*((6*b^2*(a^2 + b^2)^2*Sin
[c + d*x])/a + (6*(a - I*b)*(a + I*b)*b*(8*a^2 - b^2)*(a*Cos[c + d*x] + b*S
in[c + d*x]))/a + 2*b*(36*a^2 + 13*b^2)*(a*Cos[c + d*x] + b*Sin[c + d*x])^2
 + 60*Sqrt[a^2 + b^2]*(4*a^2 + b^2)*ArcTanh[(-b + a*Tan[(c + d*x)/2])/Sqrt[
a^2 + b^2]]*(a*Cos[c + d*x] + b*Sin[c + d*x])^2 + 30*a*(4*a^2 + 3*b^2)*Log[
Cos[(c + d*x)/2] - Sin[(c + d*x)/2]]*(a*Cos[c + d*x] + b*Sin[c + d*x])^2 -
30*a*(4*a^2 + 3*b^2)*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]*(a*Cos[c + d*
x] + b*Sin[c + d*x])^2 + (b^2*(-9*a + b)*(a*Cos[c + d*x] + b*Sin[c + d*x])^
2)/(Cos[(c + d*x)/2] - Sin[(c + d*x)/2])^2 + (2*b^3*Sin[(c + d*x)/2]*(a*Cos
[c + d*x] + b*Sin[c + d*x])^2)/(Cos[(c + d*x)/2] - Sin[(c + d*x)/2])^3 + (2
*b*(36*a^2 + 13*b^2)*Sin[(c + d*x)/2]*(a*Cos[c + d*x] + b*Sin[c + d*x])^2)/
```

```
(Cos[(c + d*x)/2] - Sin[(c + d*x)/2]) - (2*b^3*Sin[(c + d*x)/2]*(a*Cos[c +
d*x] + b*Sin[c + d*x])^2)/(Cos[(c + d*x)/2] + Sin[(c + d*x)/2])^3 + (b^2*(9
*a + b)*(a*Cos[c + d*x] + b*Sin[c + d*x])^2)/(Cos[(c + d*x)/2] + Sin[(c + d
*x)/2])^2 - (2*b*(36*a^2 + 13*b^2)*Sin[(c + d*x)/2]*(a*Cos[c + d*x] + b*Sin
[c + d*x])^2)/(Cos[(c + d*x)/2] + Sin[(c + d*x)/2])))/(12*b^6*d*(a + b*Tan[
c + d*x])^3)
```

fricas [B] time = 0.85, size = 564, normalized size = 2.36

$$\frac{4\,b^{5} + 30\left(4\,a^{4}b + a^{2}b^{3} - b^{5}\right)\cos\left(dx + c\right)^{4} + 20\left(2\,a^{2}b^{3} + b^{5}\right)\cos\left(dx + c\right)^{2} + 15\left(\left(4\,a^{4} - 3\,a^{2}b^{2} - b^{4}\right)\cos\left(dx + c\right)^{5}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/12*(4*b^5 + 30*(4*a^4*b + a^2*b^3 - b^5)*cos(d*x + c)^4 + 20*(2*a^2*b^3 +
 b^5)*cos(d*x + c)^2 + 15*((4*a^4 - 3*a^2*b^2 - b^4)*cos(d*x + c)^5 + 2*(4*
a^3*b + a*b^3)*cos(d*x + c)^4*sin(d*x + c) + (4*a^2*b^2 + b^4)*cos(d*x + c)
^3)*sqrt(a^2 + b^2)*log(-(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos
(d*x + c)^2 - 2*a^2 - b^2 + 2*sqrt(a^2 + b^2)*(b*cos(d*x + c) - a*sin(d*x +
 c)))/(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 + b^2))
 - 15*((4*a^5 - a^3*b^2 - 3*a*b^4)*cos(d*x + c)^5 + 2*(4*a^4*b + 3*a^2*b^3)
*cos(d*x + c)^4*sin(d*x + c) + (4*a^3*b^2 + 3*a*b^4)*cos(d*x + c)^3)*log(si
n(d*x + c) + 1) + 15*((4*a^5 - a^3*b^2 - 3*a*b^4)*cos(d*x + c)^5 + 2*(4*a^4
*b + 3*a^2*b^3)*cos(d*x + c)^4*sin(d*x + c) + (4*a^3*b^2 + 3*a*b^4)*cos(d*x
 + c)^3)*log(-sin(d*x + c) + 1) - 10*(a*b^4*cos(d*x + c) - 6*(3*a^3*b^2 + 2
*a*b^4)*cos(d*x + c)^3)*sin(d*x + c))/(2*a*b^7*d*cos(d*x + c)^4*sin(d*x + c
) + b^8*d*cos(d*x + c)^3 + (a^2*b^6 - b^8)*d*cos(d*x + c)^5)
```

giac [B] time = 1.60, size = 510, normalized size = 2.13

$$-\frac{\frac{15\left(4\,a^{3}+3\,ab^{2}\right)\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)}{b^{6}} - \frac{15\left(4\,a^{3}+3\,ab^{2}\right)\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)}{b^{6}} + \frac{15\left(4\,a^{4}+5\,a^{2}b^{2}+b^{4}\right)\log\left(\frac{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2\,b-2\,\sqrt{a^{2}+b^{2}}\right|}{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2\,b+2\,\sqrt{a^{2}+b^{2}}\right|}\right)}{\sqrt{a^{2}+b^{2}}\,b^{6}} + }{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -1/6*(15*(4*a^3 + 3*a*b^2)*log(abs(tan(1/2*d*x + 1/2*c) + 1))/b^6 - 15*(4*a
^3 + 3*a*b^2)*log(abs(tan(1/2*d*x + 1/2*c) - 1))/b^6 + 15*(4*a^4 + 5*a^2*b^
2 + b^4)*log(abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b - 2*sqrt(a^2 + b^2))/abs(2*
a*tan(1/2*d*x + 1/2*c) - 2*b + 2*sqrt(a^2 + b^2)))/(sqrt(a^2 + b^2)*b^6) +
2*(9*a*b*tan(1/2*d*x + 1/2*c)^5 + 36*a^2*tan(1/2*d*x + 1/2*c)^4 + 18*b^2*ta
n(1/2*d*x + 1/2*c)^4 - 72*a^2*tan(1/2*d*x + 1/2*c)^2 - 24*b^2*tan(1/2*d*x +
 1/2*c)^2 - 9*a*b*tan(1/2*d*x + 1/2*c) + 36*a^2 + 14*b^2)/((tan(1/2*d*x + 1
/2*c)^2 - 1)^3*b^5) + 6*(7*a^5*b*tan(1/2*d*x + 1/2*c)^3 + 5*a^3*b^3*tan(1/2
*d*x + 1/2*c)^3 - 2*a*b^5*tan(1/2*d*x + 1/2*c)^3 + 8*a^6*tan(1/2*d*x + 1/2*
c)^2 - 9*a^4*b^2*tan(1/2*d*x + 1/2*c)^2 - 15*a^2*b^4*tan(1/2*d*x + 1/2*c)^2
 + 2*b^6*tan(1/2*d*x + 1/2*c)^2 - 25*a^5*b*tan(1/2*d*x + 1/2*c) - 23*a^3*b^
3*tan(1/2*d*x + 1/2*c) + 2*a*b^5*tan(1/2*d*x + 1/2*c) - 8*a^6 - 7*a^4*b^2 +
 a^2*b^4)/((a*tan(1/2*d*x + 1/2*c)^2 - 2*b*tan(1/2*d*x + 1/2*c) - a)^2*a^2*
b^5))/d
```

maple [B] time = 0.52, size = 1125, normalized size = 4.71

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^7/(a+b*tan(d*x+c))^3,x)
```

```
[Out] -15/2/d*a/b^4*ln(tan(1/2*d*x+1/2*c)+1)+2/d/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1/
2*d*x+1/2*c)*b-a)^2/a*tan(1/2*d*x+1/2*c)^3-2/d/(a*tan(1/2*d*x+1/2*c)^2-2*ta
n(1/2*d*x+1/2*c)*b-a)^2/a*tan(1/2*d*x+1/2*c)+15/d/b/(a*tan(1/2*d*x+1/2*c)^2
-2*tan(1/2*d*x+1/2*c)*b-a)^2*tan(1/2*d*x+1/2*c)^2+8/d/b^5/(a*tan(1/2*d*x+1/
2*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)^2*a^4+7/d/b^3/(a*tan(1/2*d*x+1/2*c)^2-2*ta
n(1/2*d*x+1/2*c)*b-a)^2*a^2+5/d/b^2/(a^2+b^2)^(1/2)*arctanh(1/2*(2*a*tan(1/
2*d*x+1/2*c)-2*b)/(a^2+b^2)^(1/2))-3/2/d/b^4/(tan(1/2*d*x+1/2*c)-1)^2*a-6/d
/b^5/(tan(1/2*d*x+1/2*c)-1)*a^2-3/2/d/b^4/(tan(1/2*d*x+1/2*c)-1)*a+10/d*a^3
/b^6*ln(tan(1/2*d*x+1/2*c)-1)+15/2/d*a/b^4*ln(tan(1/2*d*x+1/2*c)-1)+3/2/d/b
^4/(tan(1/2*d*x+1/2*c)+1)^2*a+6/d/b^5/(tan(1/2*d*x+1/2*c)+1)*a^2-3/2/d/b^4/
(tan(1/2*d*x+1/2*c)+1)*a-10/d*a^3/b^6*ln(tan(1/2*d*x+1/2*c)+1)-5/d/b^2/(a*t
an(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)^2*a*tan(1/2*d*x+1/2*c)^3+25/d
/b^4/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)^2*a^3*tan(1/2*d*x+1/
2*c)+25/d/b^4/(a^2+b^2)^(1/2)*arctanh(1/2*(2*a*tan(1/2*d*x+1/2*c)-2*b)/(a^2
+b^2)^(1/2))*a^2+23/d/b^2/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)
^2*a*tan(1/2*d*x+1/2*c)+20/d/b^6/(a^2+b^2)^(1/2)*arctanh(1/2*(2*a*tan(1/2*d
*x+1/2*c)-2*b)/(a^2+b^2)^(1/2))*a^4+9/d/b^3/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1
/2*d*x+1/2*c)*b-a)^2*a^2*tan(1/2*d*x+1/2*c)^2-7/d/b^4/(a*tan(1/2*d*x+1/2*c)
^2-2*tan(1/2*d*x+1/2*c)*b-a)^2*a^3*tan(1/2*d*x+1/2*c)^3-1/d/b/(a*tan(1/2*d*
x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)^2+5/2/d/b^3/(tan(1/2*d*x+1/2*c)+1)-1/3
/d/b^3/(tan(1/2*d*x+1/2*c)-1)^3-1/2/d/b^3/(tan(1/2*d*x+1/2*c)-1)^2-5/2/d/b^
3/(tan(1/2*d*x+1/2*c)-1)+1/3/d/b^3/(tan(1/2*d*x+1/2*c)+1)^3-1/2/d/b^3/(tan(
1/2*d*x+1/2*c)+1)^2-8/d/b^5/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b-
a)^2*a^4*tan(1/2*d*x+1/2*c)^2-2/d*b/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1
/2*c)*b-a)^2/a^2*tan(1/2*d*x+1/2*c)^2
```

maxima [B] time = 0.75, size = 902, normalized size = 3.77

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^7/(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/6*(2*(60*a^6 + 35*a^4*b^2 - 3*a^2*b^4 + (210*a^5*b + 125*a^3*b^3 - 6*a*b^
5)*sin(d*x + c)/(cos(d*x + c) + 1) - 2*(120*a^6 - 10*a^4*b^2 - 55*a^2*b^4 +
 3*b^6)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 2*(330*a^5*b + 205*a^3*b^3 -
12*a*b^5)*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 2*(180*a^6 - 95*a^4*b^2 - 1
20*a^2*b^4 + 9*b^6)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + 12*(60*a^5*b + 35
*a^3*b^3 - 3*a*b^5)*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 6*(40*a^6 - 30*a^
4*b^2 - 35*a^2*b^4 + 3*b^6)*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 - 6*(50*a^5
*b + 25*a^3*b^3 - 4*a*b^5)*sin(d*x + c)^7/(cos(d*x + c) + 1)^7 + 3*(20*a^6
- 15*a^4*b^2 - 15*a^2*b^4 + 2*b^6)*sin(d*x + c)^8/(cos(d*x + c) + 1)^8 + 3*
(10*a^5*b + 5*a^3*b^3 - 2*a*b^5)*sin(d*x + c)^9/(cos(d*x + c) + 1)^9)/(a^4*
b^5 + 4*a^3*b^6*sin(d*x + c)/(cos(d*x + c) + 1) - 16*a^3*b^6*sin(d*x + c)^3
/(cos(d*x + c) + 1)^3 + 24*a^3*b^6*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 16
*a^3*b^6*sin(d*x + c)^7/(cos(d*x + c) + 1)^7 + 4*a^3*b^6*sin(d*x + c)^9/(co
s(d*x + c) + 1)^9 - a^4*b^5*sin(d*x + c)^10/(cos(d*x + c) + 1)^10 - (5*a^4*
b^5 - 4*a^2*b^7)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + 2*(5*a^4*b^5 - 6*a^2
*b^7)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 - 2*(5*a^4*b^5 - 6*a^2*b^7)*sin(d
*x + c)^6/(cos(d*x + c) + 1)^6 + (5*a^4*b^5 - 4*a^2*b^7)*sin(d*x + c)^8/(co
s(d*x + c) + 1)^8) - 15*(4*a^3 + 3*a*b^2)*log(sin(d*x + c)/(cos(d*x + c) +
1) + 1)/b^6 + 15*(4*a^3 + 3*a*b^2)*log(sin(d*x + c)/(cos(d*x + c) + 1) - 1)
/b^6 - 15*(4*a^4 + 5*a^2*b^2 + b^4)*log((b - a*sin(d*x + c)/(cos(d*x + c) +
 1) + sqrt(a^2 + b^2))/(b - a*sin(d*x + c)/(cos(d*x + c) + 1) - sqrt(a^2 +
b^2)))/(sqrt(a^2 + b^2)*b^6))/d
```

mupad [B] time = 6.94, size = 1203, normalized size = 5.03

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^7*(a + b*tan(c + d*x))^3),x)
```

```
[Out] ((60*a^4 - 3*b^4 + 35*a^2*b^2)/(3*b^5) + (tan(c/2 + (d*x)/2)*(210*a^4 - 6*b
^4 + 125*a^2*b^2))/(3*a*b^4) + (tan(c/2 + (d*x)/2)^8*(20*a^6 + 2*b^6 - 15*a
^2*b^4 - 15*a^4*b^2))/(a^2*b^5) - (2*tan(c/2 + (d*x)/2)^6*(40*a^6 + 3*b^6 -
 35*a^2*b^4 - 30*a^4*b^2))/(a^2*b^5) - (2*tan(c/2 + (d*x)/2)^2*(120*a^6 + 3
*b^6 - 55*a^2*b^4 - 10*a^4*b^2))/(3*a^2*b^5) + (2*tan(c/2 + (d*x)/2)^4*(180
*a^6 + 9*b^6 - 120*a^2*b^4 - 95*a^4*b^2))/(3*a^2*b^5) + (tan(c/2 + (d*x)/2)
^9*(10*a^4 - 2*b^4 + 5*a^2*b^2))/(a*b^4) - (2*tan(c/2 + (d*x)/2)^7*(50*a^4
- 4*b^4 + 25*a^2*b^2))/(a*b^4) + (4*tan(c/2 + (d*x)/2)^5*(60*a^4 - 3*b^4 +
35*a^2*b^2))/(a*b^4) - (2*tan(c/2 + (d*x)/2)^3*(330*a^4 - 12*b^4 + 205*a^2*
b^2))/(3*a*b^4))/(d*(tan(c/2 + (d*x)/2)^8*(5*a^2 - 4*b^2) - tan(c/2 + (d*x)
/2)^2*(5*a^2 - 4*b^2) + tan(c/2 + (d*x)/2)^4*(10*a^2 - 12*b^2) - tan(c/2 +
(d*x)/2)^6*(10*a^2 - 12*b^2) - a^2*tan(c/2 + (d*x)/2)^10 + a^2 - 16*a*b*tan
(c/2 + (d*x)/2)^3 + 24*a*b*tan(c/2 + (d*x)/2)^5 - 16*a*b*tan(c/2 + (d*x)/2)
^7 + 4*a*b*tan(c/2 + (d*x)/2)^9 + 4*a*b*tan(c/2 + (d*x)/2))) - (atanh((3000
*a^2*tan(c/2 + (d*x)/2))/(3000*a^2 + (7000*a^4)/b^2 + (4000*a^6)/b^4) + (70
00*a^4*tan(c/2 + (d*x)/2))/(7000*a^4 + 3000*a^2*b^2 + (4000*a^6)/b^2) + (40
00*a^6*tan(c/2 + (d*x)/2))/(4000*a^6 + 3000*a^2*b^4 + 7000*a^4*b^2))*(15*a*
b^2 + 20*a^3))/(b^6*d) + (5*atanh((1000*a^2*(a^2 + b^2)^(1/2))/(1000*a^2*b
+ (5000*a^4)/b + (4000*a^6)/b^3 + 10000*a^3*tan(c/2 + (d*x)/2) + 2000*a*b^2
*tan(c/2 + (d*x)/2) + (8000*a^5*tan(c/2 + (d*x)/2))/b^2) + (4000*a^4*(a^2 +
 b^2)^(1/2))/(5000*a^4*b + 1000*a^2*b^3 + (4000*a^6)/b + 8000*a^5*tan(c/2 +
 (d*x)/2) + 2000*a*b^4*tan(c/2 + (d*x)/2) + 10000*a^3*b^2*tan(c/2 + (d*x)/2
)) + (9000*a^3*tan(c/2 + (d*x)/2)*(a^2 + b^2)^(1/2))/(5000*a^4 + 1000*a^2*b
^2 + (4000*a^6)/b^2 + 2000*a*b^3*tan(c/2 + (d*x)/2) + 10000*a^3*b*tan(c/2 +
 (d*x)/2) + (8000*a^5*tan(c/2 + (d*x)/2))/b) + (4000*a^5*tan(c/2 + (d*x)/2)
*(a^2 + b^2)^(1/2))/(4000*a^6 + 1000*a^2*b^4 + 5000*a^4*b^2 + 2000*a*b^5*ta
n(c/2 + (d*x)/2) + 8000*a^5*b*tan(c/2 + (d*x)/2) + 10000*a^3*b^3*tan(c/2 +
(d*x)/2)) + (2000*a*tan(c/2 + (d*x)/2)*(a^2 + b^2)^(1/2))/(1000*a^2 + (5000
*a^4)/b^2 + (4000*a^6)/b^4 + (10000*a^3*tan(c/2 + (d*x)/2))/b + (8000*a^5*t
an(c/2 + (d*x)/2))/b^3 + 2000*a*b*tan(c/2 + (d*x)/2)))*(4*a^2 + b^2)*(a^2 +
 b^2)^(1/2))/(b^6*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^7(c+dx)}{(a+b\tan(c+dx))^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**7/(a+b*tan(d*x+c))**3,x)
```

```
[Out] Integral(sec(c + d*x)**7/(a + b*tan(c + d*x))**3, x)
```

3.573 $\int \frac{\sec^5(c+dx)}{(a+b\tan(c+dx))^3} dx$

Optimal. Leaf size=148

$$-\frac{3\left(2a^2+b^2\right)\tanh^{-1}\left(\frac{b\cos(c+dx)-a\sin(c+dx)}{\sqrt{a^2+b^2}}\right)}{2b^4d\sqrt{a^2+b^2}}-\frac{3a\tanh^{-1}(\sin(c+dx))}{b^4d}+\frac{3\sec(c+dx)(2a+b\tan(c+dx))}{2b^3d(a+b\tan(c+dx))}-\frac{\quad}{2bd(a}$$

```
[Out] -3*a*arctanh(sin(d*x+c))/b^4/d-3/2*(2*a^2+b^2)*arctanh((b*cos(d*x+c)-a*sin(
d*x+c))/(a^2+b^2)^(1/2))/b^4/d/(a^2+b^2)^(1/2)-1/2*sec(d*x+c)^3/b/d/(a+b*ta
n(d*x+c))^2+3/2*sec(d*x+c)*(2*a+b*tan(d*x+c))/b^3/d/(a+b*tan(d*x+c))
```

Rubi [A] time = 0.16, antiderivative size = 189, normalized size of antiderivative = 1.28, number of steps used = 7, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {3512, 733, 813, 844, 215, 725, 206}

$$-\frac{3\left(2a^2+b^2\right)\sec(c+dx)\tanh^{-1}\left(\frac{b-a\tan(c+dx)}{\sqrt{a^2+b^2}\sqrt{\sec^2(c+dx)}}\right)}{2b^4d\sqrt{a^2+b^2}\sqrt{\sec^2(c+dx)}}+\frac{3\sec(c+dx)(2a+b\tan(c+dx))}{2b^3d(a+b\tan(c+dx))}-\frac{3a\sec(c+dx)\sinh^{-1}}{b^4d\sqrt{\sec^2(c}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^5/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (-3*a*ArcSinh[Tan[c + d*x]]*Sec[c + d*x])/(b^4*d*Sqrt[Sec[c + d*x]^2]) - (3
*(2*a^2 + b^2)*ArcTanh[(b - a*Tan[c + d*x])/(Sqrt[a^2 + b^2]*Sqrt[Sec[c + d
*x]^2])]*Sec[c + d*x])/(2*b^4*Sqrt[a^2 + b^2]*d*Sqrt[Sec[c + d*x]^2]) - Sec
[c + d*x]^3/(2*b*d*(a + b*Tan[c + d*x])^2) + (3*Sec[c + d*x]*(2*a + b*Tan[c
 + d*x]))/(2*b^3*d*(a + b*Tan[c + d*x]))
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 215

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Simp[ArcSinh[(Rt[b, 2]*x)/Sqr
t[a]]/Rt[b, 2], x] /; FreeQ[{a, b}, x] && GtQ[a, 0] && PosQ[b]
```

Rule 725

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 733

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m + 1)*(a + c*x^2)^p)/(e*(m + 1)), x] - Dist[(2*c*p)/(e*(m + 1)
), Int[x*(d + e*x)^(m + 1)*(a + c*x^2)^(p - 1), x], x] /; FreeQ[{a, c, d, e
, m}, x] && NeQ[c*d^2 + a*e^2, 0] && GtQ[p, 0] && (IntegerQ[p] || LtQ[m, -1
]) && NeQ[m, -1] &&  !ILtQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e,
m, p, x]
```

Rule 813

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[((d + e*x)^(m + 1)*(e*f*(m + 2*p + 2) - d*g*(2*p + 1
```

```
) + e*g*(m + 1)*x)*(a + c*x^2)^p)/(e^2*(m + 1)*(m + 2*p + 2)), x] + Dist[p/
(e^2*(m + 1)*(m + 2*p + 2)), Int[(d + e*x)^(m + 1)*(a + c*x^2)^(p - 1)*Simp
[g*(2*a*e + 2*a*e*m) + (g*(2*c*d + 4*c*d*p) - 2*c*e*f*(m + 2*p + 2))*x, x],
 x], x] /; FreeQ[{a, c, d, e, f, g, m}, x] && NeQ[c*d^2 + a*e^2, 0] && Rati
onalQ[p] && p > 0 && (LtQ[m, -1] || EqQ[p, 1] || (IntegerQ[p] &&  !Rational
Q[m])) && NeQ[m, -1] &&  !ILtQ[m + 2*p + 1, 0] && (IntegerQ[m] || IntegerQ[
p] || IntegersQ[2*m, 2*p])
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\sec^5(c+dx)}{(a+b\tan(c+dx))^3}\,dx = \frac{\sec(c+dx)\,\text{Subst}\left(\int \frac{\left(1+\frac{x^2}{b^2}\right)^{3/2}}{(a+x)^3}\,dx, x, b\tan(c+dx)\right)}{bd\sqrt{\sec^2(c+dx)}}$$

$$= -\frac{\sec^3(c+dx)}{2bd(a+b\tan(c+dx))^2} + \frac{(3\sec(c+dx))\,\text{Subst}\left(\int \frac{x\sqrt{1+\frac{x^2}{b^2}}}{(a+x)^2}\,dx, x, b\tan(c+dx)\right)}{2b^3d\sqrt{\sec^2(c+dx)}}$$

$$= -\frac{\sec^3(c+dx)}{2bd(a+b\tan(c+dx))^2} + \frac{3\sec(c+dx)(2a+b\tan(c+dx))}{2b^3d(a+b\tan(c+dx))} - \frac{(3\sec(c+dx))\,\text{Subs}}{4}$$

$$= -\frac{\sec^3(c+dx)}{2bd(a+b\tan(c+dx))^2} + \frac{3\sec(c+dx)(2a+b\tan(c+dx))}{2b^3d(a+b\tan(c+dx))} - \frac{(3a\sec(c+dx))\,\text{Sul}}{b^5}$$

$$= -\frac{3a\sinh^{-1}(\tan(c+dx))\sec(c+dx)}{b^4d\sqrt{\sec^2(c+dx)}} - \frac{\sec^3(c+dx)}{2bd(a+b\tan(c+dx))^2} + \frac{3\sec(c+dx)(2a+}{2b^3d(a+b\,\text{ta}}$$

$$= -\frac{3a\sinh^{-1}(\tan(c+dx))\sec(c+dx)}{b^4d\sqrt{\sec^2(c+dx)}} - \frac{3\left(2a^2+b^2\right)\tanh^{-1}\left(\frac{b\left(1-\frac{a\tan(c+dx)}{b}\right)}{\sqrt{a^2+b^2}\sqrt{\sec^2(c+dx)}}\right)\sec(c}{2b^4\sqrt{a^2+b^2}\,d\sqrt{\sec^2(c+dx)}}$$

Mathematica [B] time = 2.45, size = 396, normalized size = 2.68

$$\sec^3(c+dx)(a\cos(c+dx)+b\sin(c+dx))\left(\frac{b^2(a^2+b^2)\sin(c+dx)}{a}+\frac{6(2a^2+b^2)(a\cos(c+dx)+b\sin(c+dx))^2\tanh^{-1}\left(\frac{a\tan\left(\frac{1}{2}(c+dx)\right)-b}{\sqrt{a^2+b^2}}\right.}{\sqrt{a^2+b^2}}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^5/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (Sec[c + d*x]^3*(a*Cos[c + d*x] + b*Sin[c + d*x])*((b^2*(a^2 + b^2)*Sin[c +
 d*x])/a + ((2*a - b)*b*(2*a + b)*(a*Cos[c + d*x] + b*Sin[c + d*x]))/a + 2*
b*(a*Cos[c + d*x] + b*Sin[c + d*x])^2 + (6*(2*a^2 + b^2)*ArcTanh[(-b + a*Ta
n[(c + d*x)/2])/Sqrt[a^2 + b^2]]*(a*Cos[c + d*x] + b*Sin[c + d*x])^2)/Sqrt[
a^2 + b^2] + 6*a*Log[Cos[(c + d*x)/2] - Sin[(c + d*x)/2]]*(a*Cos[c + d*x] +
 b*Sin[c + d*x])^2 - 6*a*Log[Cos[(c + d*x)/2] + Sin[(c + d*x)/2]]*(a*Cos[c
+ d*x] + b*Sin[c + d*x])^2 + (2*b*Sin[(c + d*x)/2]*(a*Cos[c + d*x] + b*Sin[
c + d*x])^2)/(Cos[(c + d*x)/2] - Sin[(c + d*x)/2]) - (2*b*Sin[(c + d*x)/2]*
(a*Cos[c + d*x] + b*Sin[c + d*x])^2)/(Cos[(c + d*x)/2] + Sin[(c + d*x)/2]))
)/(2*b^4*d*(a + b*Tan[c + d*x])^3)
```

fricas [B] time = 0.71, size = 513, normalized size = 3.47

$$\frac{4\,a^2b^3+4\,b^5+6\left(2\,a^4b+a^2b^3-b^5\right)\cos\left(dx+c\right)^2+18\left(a^3b^2+ab^4\right)\cos\left(dx+c\right)\sin\left(dx+c\right)+3\left(\left(2\,a^4-a^2b^2\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/4*(4*a^2*b^3 + 4*b^5 + 6*(2*a^4*b + a^2*b^3 - b^5)*cos(d*x + c)^2 + 18*(a
^3*b^2 + a*b^4)*cos(d*x + c)*sin(d*x + c) + 3*((2*a^4 - a^2*b^2 - b^4)*cos(
d*x + c)^3 + 2*(2*a^3*b + a*b^3)*cos(d*x + c)^2*sin(d*x + c) + (2*a^2*b^2 +
 b^4)*cos(d*x + c))*sqrt(a^2 + b^2)*log(-(2*a*b*cos(d*x + c)*sin(d*x + c) +
 (a^2 - b^2)*cos(d*x + c)^2 - 2*a^2 - b^2 + 2*sqrt(a^2 + b^2)*(b*cos(d*x +
c) - a*sin(d*x + c)))/(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*
x + c)^2 + b^2)) - 6*((a^5 - a*b^4)*cos(d*x + c)^3 + 2*(a^4*b + a^2*b^3)*co
s(d*x + c)^2*sin(d*x + c) + (a^3*b^2 + a*b^4)*cos(d*x + c))*log(sin(d*x + c
) + 1) + 6*((a^5 - a*b^4)*cos(d*x + c)^3 + 2*(a^4*b + a^2*b^3)*cos(d*x + c)
^2*sin(d*x + c) + (a^3*b^2 + a*b^4)*cos(d*x + c))*log(-sin(d*x + c) + 1))/(
(a^4*b^4 - b^8)*d*cos(d*x + c)^3 + 2*(a^3*b^5 + a*b^7)*d*cos(d*x + c)^2*sin
(d*x + c) + (a^2*b^6 + b^8)*d*cos(d*x + c))
```

giac [B] time = 3.69, size = 314, normalized size = 2.12

$$-\frac{\frac{6\,a\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+1\right|\right)}{b^4}-\frac{6\,a\log\left(\left|\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-1\right|\right)}{b^4}+\frac{3\left(2\,a^2+b^2\right)\log\left(\frac{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2\,b-2\,\sqrt{a^2+b^2}\right|}{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2\,b+2\,\sqrt{a^2+b^2}\right|}\right)}{\sqrt{a^2+b^2}\,b^4}+\frac{4}{\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-1\right)b^3}+\cdots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -1/2*(6*a*log(abs(tan(1/2*d*x + 1/2*c) + 1))/b^4 - 6*a*log(abs(tan(1/2*d*x
+ 1/2*c) - 1))/b^4 + 3*(2*a^2 + b^2)*log(abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b
 - 2*sqrt(a^2 + b^2))/abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b + 2*sqrt(a^2 + b^2
```

```
)))/(sqrt(a^2 + b^2)*b^4) + 4/((tan(1/2*d*x + 1/2*c)^2 - 1)*b^3) + 2*(3*a^3
*b*tan(1/2*d*x + 1/2*c)^3 - 2*a*b^3*tan(1/2*d*x + 1/2*c)^3 + 4*a^4*tan(1/2*
d*x + 1/2*c)^2 - 9*a^2*b^2*tan(1/2*d*x + 1/2*c)^2 + 2*b^4*tan(1/2*d*x + 1/2
*c)^2 - 13*a^3*b*tan(1/2*d*x + 1/2*c) + 2*a*b^3*tan(1/2*d*x + 1/2*c) - 4*a^
4 + a^2*b^2)/((a*tan(1/2*d*x + 1/2*c)^2 - 2*b*tan(1/2*d*x + 1/2*c) - a)^2*a
^2*b^3))/d
```

maple [B] time = 0.50, size = 611, normalized size = 4.13

$$-\frac{3a\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d\,b^2\left(a\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)b-a\right)^2}+\frac{2\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{d\left(a\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)b-a\right)^2a}-\frac{}{d\,b^3\left(a\left(\tan^2\left(\right.\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^5/(a+b*tan(d*x+c))^3,x)
```

```
[Out] -3/d/b^2/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)^2*a*tan(1/2*d*x+
1/2*c)^3+2/d/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)^2/a*tan(1/2*
d*x+1/2*c)^3-4/d/b^3/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)^2*a^
2*tan(1/2*d*x+1/2*c)^2+9/d/b/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b
-a)^2*tan(1/2*d*x+1/2*c)^2-2/d*b/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*
c)*b-a)^2/a^2*tan(1/2*d*x+1/2*c)^2+13/d/b^2/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1
/2*d*x+1/2*c)*b-a)^2*a*tan(1/2*d*x+1/2*c)-2/d/(a*tan(1/2*d*x+1/2*c)^2-2*tan
(1/2*d*x+1/2*c)*b-a)^2/a*tan(1/2*d*x+1/2*c)+4/d/b^3/(a*tan(1/2*d*x+1/2*c)^2
-2*tan(1/2*d*x+1/2*c)*b-a)^2*a^2-1/d/b/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*
x+1/2*c)*b-a)^2+6/d/b^4/(a^2+b^2)^(1/2)*arctanh(1/2*(2*a*tan(1/2*d*x+1/2*c)
-2*b)/(a^2+b^2)^(1/2))*a^2+3/d/b^2/(a^2+b^2)^(1/2)*arctanh(1/2*(2*a*tan(1/2
*d*x+1/2*c)-2*b)/(a^2+b^2)^(1/2))-1/d/b^3/(tan(1/2*d*x+1/2*c)-1)+3/d*a/b^4*
ln(tan(1/2*d*x+1/2*c)-1)+1/d/b^3/(tan(1/2*d*x+1/2*c)+1)-3/d*a/b^4*ln(tan(1/
2*d*x+1/2*c)+1)
```

maxima [B] time = 0.45, size = 518, normalized size = 3.50

$$\frac{\frac{2\left(6\,a^4-a^2b^2+\frac{\left(21\,a^3b-2\,ab^3\right)\sin(dx+c)}{\cos(dx+c)+1}-\frac{2\left(6\,a^4-9\,a^2b^2+b^4\right)\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-\frac{4\left(6\,a^3b-ab^3\right)\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{\left(6\,a^4-9\,a^2b^2+2\,b^4\right)\sin(dx+c)^4}{(\cos(dx+c)+1)^4}+\frac{\left(3\,a^3b-2\,ab^3\right)\sin(dx+c)^5}{(\cos(dx+c)+1)^5}\right)}{a^4b^3+\frac{4\,a^3b^4\sin(dx+c)}{\cos(dx+c)+1}-\frac{8\,a^3b^4\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{4\,a^3b^4\sin(dx+c)^5}{(\cos(dx+c)+1)^5}-\frac{a^4b^3\sin(dx+c)^6}{(\cos(dx+c)+1)^6}-\frac{\left(3\,a^4b^3-4\,a^2b^5\right)\sin(dx+c)^2}{(\cos(dx+c)+1)^2}+\frac{\left(3\,a^4b^3-4\,a^2b^5\right)\sin(dx+c)^4}{(\cos(dx+c)+1)^4}}-\frac{6\,a\log\left(\right.}{}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^5/(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] 1/2*(2*(6*a^4 - a^2*b^2 + (21*a^3*b - 2*a*b^3)*sin(d*x + c)/(cos(d*x + c) +
 1) - 2*(6*a^4 - 9*a^2*b^2 + b^4)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 4*(
6*a^3*b - a*b^3)*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + (6*a^4 - 9*a^2*b^2 +
 2*b^4)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + (3*a^3*b - 2*a*b^3)*sin(d*x +
 c)^5/(cos(d*x + c) + 1)^5)/(a^4*b^3 + 4*a^3*b^4*sin(d*x + c)/(cos(d*x + c)
 + 1) - 8*a^3*b^4*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + 4*a^3*b^4*sin(d*x +
 c)^5/(cos(d*x + c) + 1)^5 - a^4*b^3*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 -
(3*a^4*b^3 - 4*a^2*b^5)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 + (3*a^4*b^3 -
4*a^2*b^5)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4) - 6*a*log(sin(d*x + c)/(cos
(d*x + c) + 1) + 1)/b^4 + 6*a*log(sin(d*x + c)/(cos(d*x + c) + 1) - 1)/b^4
- 3*(2*a^2 + b^2)*log((b - a*sin(d*x + c)/(cos(d*x + c) + 1) + sqrt(a^2 + b
^2))/(b - a*sin(d*x + c)/(cos(d*x + c) + 1) - sqrt(a^2 + b^2)))/(sqrt(a^2 +
 b^2)*b^4))/d
```

mupad [B] time = 5.68, size = 1311, normalized size = 8.86

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(cos(c + d*x)^5*(a + b*tan(c + d*x))^3),x)

[Out] ((6*a^2 - b^2)/b^3 - (2*tan(c/2 + (d*x)/2)^2*(6*a^4 + b^4 - 9*a^2*b^2))/(a^2*b^3) + (tan(c/2 + (d*x)/2)*(21*a^2 - 2*b^2))/(a*b^2) + (tan(c/2 + (d*x)/2)^4*(6*a^4 + 2*b^4 - 9*a^2*b^2))/(a^2*b^3) - (4*tan(c/2 + (d*x)/2)^3*(6*a^2 - b^2))/(a*b^2) + (tan(c/2 + (d*x)/2)^5*(3*a^2 - 2*b^2))/(a*b^2))/(d*(tan(c/2 + (d*x)/2)^4*(3*a^2 - 4*b^2) - tan(c/2 + (d*x)/2)^2*(3*a^2 - 4*b^2) - a^2*tan(c/2 + (d*x)/2)^6 + a^2 - 8*a*b*tan(c/2 + (d*x)/2)^3 + 4*a*b*tan(c/2 + (d*x)/2)^5 + 4*a*b*tan(c/2 + (d*x)/2))) - (6*a*atanh(tan(c/2 + (d*x)/2)))/(b^4*d) + (atan((((2*a^2 + b^2)*(a^2 + b^2)^(1/2)*((288*a^4)/b^5 + (8*tan(c/2 + (d*x)/2)*(9*a*b^7 + 108*a^3*b^5 + 72*a^5*b^3))/b^9 - (3*(2*a^2 + b^2)*(a^2 + b^2)^(1/2)*((8*tan(c/2 + (d*x)/2)*(12*a*b^10 + 24*a^3*b^8))/b^9 - 48*a^2 + (3*(2*a^2 + b^2)*(a^2 + b^2)^(1/2)*(32*a^2*b^3 + (8*tan(c/2 + (d*x)/2)*(12*a*b^13 + 8*a^3*b^11))/b^9))/(2*(b^6 + a^2*b^4))))/(2*(b^6 + a^2*b^4)))*3i)/(2*(b^6 + a^2*b^4)) + ((2*a^2 + b^2)*(a^2 + b^2)^(1/2)*((288*a^4)/b^5 + (8*tan(c/2 + (d*x)/2)*(9*a*b^7 + 108*a^3*b^5 + 72*a^5*b^3))/b^9 - (3*(2*a^2 + b^2)*(a^2 + b^2)^(1/2)*(48*a^2 - (8*tan(c/2 + (d*x)/2)*(12*a*b^10 + 24*a^3*b^8))/b^9 + (3*(2*a^2 + b^2)*(a^2 + b^2)^(1/2)*(32*a^2*b^3 + (8*tan(c/2 + (d*x)/2)*(12*a*b^13 + 8*a^3*b^11))/b^9))/(2*(b^6 + a^2*b^4))))/(2*(b^6 + a^2*b^4)))*3i)/(2*(b^6 + a^2*b^4)))/((16*(54*a^4 + 27*a^2*b^2))/b^8 - (16*tan(c/2 + (d*x)/2)*(216*a^5 + 108*a^3*b^2))/b^9 - (3*(2*a^2 + b^2)*(a^2 + b^2)^(1/2)*((288*a^4)/b^5 + (8*tan(c/2 + (d*x)/2)*(9*a*b^7 + 108*a^3*b^5 + 72*a^5*b^3))/b^9 - (3*(2*a^2 + b^2)*(a^2 + b^2)^(1/2)*((8*tan(c/2 + (d*x)/2)*(12*a*b^10 + 24*a^3*b^8))/b^9 - 48*a^2 + (3*(2*a^2 + b^2)*(a^2 + b^2)^(1/2)*(32*a^2*b^3 + (8*tan(c/2 + (d*x)/2)*(12*a*b^13 + 8*a^3*b^11))/b^9))/(2*(b^6 + a^2*b^4))))/(2*(b^6 + a^2*b^4))))/(2*(b^6 + a^2*b^4)) + (3*(2*a^2 + b^2)*(a^2 + b^2)^(1/2)*((288*a^4)/b^5 + (8*tan(c/2 + (d*x)/2)*(9*a*b^7 + 108*a^3*b^5 + 72*a^5*b^3))/b^9 - (3*(2*a^2 + b^2)*(a^2 + b^2)^(1/2)*(48*a^2 - (8*tan(c/2 + (d*x)/2)*(12*a*b^10 + 24*a^3*b^8))/b^9 + (3*(2*a^2 + b^2)*(a^2 + b^2)^(1/2)*(32*a^2*b^3 + (8*tan(c/2 + (d*x)/2)*(12*a*b^13 + 8*a^3*b^11))/b^9))/(2*(b^6 + a^2*b^4))))/(2*(b^6 + a^2*b^4))))/(2*(b^6 + a^2*b^4))))*(2*a^2 + b^2)*(a^2 + b^2)^(1/2)*3i)/(d*(b^6 + a^2*b^4))

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^5(c + dx)}{(a + b\tan(c + dx))^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(sec(d*x+c)**5/(a+b*tan(d*x+c))**3,x)

[Out] Integral(sec(c + d*x)**5/(a + b*tan(c + d*x))**3, x)

3.574 $\int \frac{\sec^3(c+dx)}{(a+b\tan(c+dx))^3}\,dx$

Optimal. Leaf size=95

$$-\frac{\sec(c+dx)(b-a\tan(c+dx))}{2d\left(a^2+b^2\right)(a+b\tan(c+dx))^2}-\frac{\tanh^{-1}\left(\frac{b\cos(c+dx)-a\sin(c+dx)}{\sqrt{a^2+b^2}}\right)}{2d\left(a^2+b^2\right)^{3/2}}$$

```
[Out] -1/2*arctanh((b*cos(d*x+c)-a*sin(d*x+c))/(a^2+b^2)^(1/2))/(a^2+b^2)^(3/2)/d
-1/2*sec(d*x+c)*(b-a*tan(d*x+c))/(a^2+b^2)/d/(a+b*tan(d*x+c))^2
```

Rubi [A] time = 0.09, antiderivative size = 118, normalized size of antiderivative = 1.24, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {3512, 721, 725, 206}

$$-\frac{\sec(c+dx)(b-a\tan(c+dx))}{2d\left(a^2+b^2\right)(a+b\tan(c+dx))^2}-\frac{\sec(c+dx)\tanh^{-1}\left(\frac{b-a\tan(c+dx)}{\sqrt{a^2+b^2}\sqrt{\sec^2(c+dx)}}\right)}{2d\left(a^2+b^2\right)^{3/2}\sqrt{\sec^2(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] -(ArcTanh[(b - a*Tan[c + d*x])/(Sqrt[a^2 + b^2]*Sqrt[Sec[c + d*x]^2])]*Sec[
c + d*x])/(2*(a^2 + b^2)^(3/2)*d*Sqrt[Sec[c + d*x]^2]) - (Sec[c + d*x]*(b -
 a*Tan[c + d*x]))/(2*(a^2 + b^2)*d*(a + b*Tan[c + d*x])^2)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 721

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(-2*a*e + (2*c*d)*x)*(a + c*x^2)^p)/(2*(m + 1)*(c*d^2 +
 a*e^2)), x] - Dist[(4*a*c*p)/(2*(m + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^(m
 + 2)*(a + c*x^2)^(p - 1), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^2 +
a*e^2, 0] && EqQ[m + 2*p + 2, 0] && GtQ[p, 0]
```

Rule 725

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\sec^3(c+dx)}{(a+b\tan(c+dx))^3}\,dx = \frac{\sec(c+dx)\,\text{Subst}\left(\int \frac{\sqrt{1+\frac{x^2}{b^2}}}{(a+x)^3}\,dx, x, b\tan(c+dx)\right)}{bd\sqrt{\sec^2(c+dx)}}$$

$$= -\frac{\sec(c+dx)(b-a\tan(c+dx))}{2\left(a^2+b^2\right)d(a+b\tan(c+dx))^2} + \frac{\sec(c+dx)\,\text{Subst}\left(\int \frac{1}{(a+x)\sqrt{1+\frac{x^2}{b^2}}}\,dx, x, b\tan\right.}{2b\left(a^2+b^2\right)d\sqrt{\sec^2(c+dx)}}$$

$$= -\frac{\sec(c+dx)(b-a\tan(c+dx))}{2\left(a^2+b^2\right)d(a+b\tan(c+dx))^2} - \frac{\sec(c+dx)\,\text{Subst}\left(\int \frac{1}{1+\frac{a^2}{b^2}-x^2}\,dx, x, \frac{1-\frac{a\tan(c+d}{b}}{\sqrt{\sec^2(c+d}}\right.}{2b\left(a^2+b^2\right)d\sqrt{\sec^2(c+dx)}}$$

$$= -\frac{\tanh^{-1}\left(\frac{b\left(1-\frac{a\tan(c+dx)}{b}\right)}{\sqrt{a^2+b^2}\sqrt{\sec^2(c+dx)}}\right)\sec(c+dx)}{2\left(a^2+b^2\right)^{3/2}d\sqrt{\sec^2(c+dx)}} - \frac{\sec(c+dx)(b-a\tan(c+dx))}{2\left(a^2+b^2\right)d(a+b\tan(c+dx))^2}$$

Mathematica [C] time = 0.30, size = 132, normalized size = 1.39

$$\frac{\left(a^2+b^2\right)(a\sin(c+dx)-b\cos(c+dx))+2\sqrt{a^2+b^2}(a\cos(c+dx)+b\sin(c+dx))^2\tanh^{-1}\left(\frac{a\tan\left(\frac{1}{2}(c+dx)\right)-b}{\sqrt{a^2+b^2}}\right)}{2d(a-ib)^2(a+ib)^2(a\cos(c+dx)+b\sin(c+dx))^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^3/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] ((a^2 + b^2)*(-(b*Cos[c + d*x]) + a*Sin[c + d*x]) + 2*Sqrt[a^2 + b^2]*ArcTa
nh[(-b + a*Tan[(c + d*x)/2])/Sqrt[a^2 + b^2]]*(a*Cos[c + d*x] + b*Sin[c + d
*x])^2)/(2*(a - I*b)^2*(a + I*b)^2*d*(a*Cos[c + d*x] + b*Sin[c + d*x])^2)
```

fricas [B] time = 0.50, size = 294, normalized size = 3.09

$$\frac{\left(2\,ab\cos(dx+c)\sin(dx+c)+\left(a^2-b^2\right)\cos(dx+c)^2+b^2\right)\sqrt{a^2+b^2}\,\log\left(-\frac{2\,ab\cos(dx+c)\sin(dx+c)+\left(a^2-b^2\right)\cos(dx+c}{2\,ab\cos(dx+c)\sin(dx+}\right.}{4\left(\left(a^6+a^4b^2-a^2b^4-b^6\right)d\cos(dx+c)^2+2\left(a^5b+2\,a^3b^3+ab^5\right)d\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/4*((2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 + b^2)*s
qrt(a^2 + b^2)*log(-(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x
+ c)^2 - 2*a^2 - b^2 + 2*sqrt(a^2 + b^2)*(b*cos(d*x + c) - a*sin(d*x + c)))
/(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 + b^2)) - 2*
(a^2*b + b^3)*cos(d*x + c) + 2*(a^3 + a*b^2)*sin(d*x + c))/((a^6 + a^4*b^2
- a^2*b^4 - b^6)*d*cos(d*x + c)^2 + 2*(a^5*b + 2*a^3*b^3 + a*b^5)*d*cos(d*x
 + c)*sin(d*x + c) + (a^4*b^2 + 2*a^2*b^4 + b^6)*d)
```

giac [B] time = 1.74, size = 221, normalized size = 2.33

$$-\frac{\frac{\log\left(\frac{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2\,b-2\,\sqrt{a^2+b^2}\right|}{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2\,b+2\,\sqrt{a^2+b^2}\right|}\right)}{\left(a^2+b^2\right)^{\frac{3}{2}}} - \frac{2\left(a^3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+2\,ab^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+a^2b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-2\,b^3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+a^3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\right.\right.}{\left(a^4+a^2b^2\right)\left(a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2-2\,b\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-a\right)^2}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -1/2*(log(abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b - 2*sqrt(a^2 + b^2))/abs(2*a*t
an(1/2*d*x + 1/2*c) - 2*b + 2*sqrt(a^2 + b^2)))/(a^2 + b^2)^(3/2) - 2*(a^3*
tan(1/2*d*x + 1/2*c)^3 + 2*a*b^2*tan(1/2*d*x + 1/2*c)^3 + a^2*b*tan(1/2*d*x
 + 1/2*c)^2 - 2*b^3*tan(1/2*d*x + 1/2*c)^2 + a^3*tan(1/2*d*x + 1/2*c) - 2*a
*b^2*tan(1/2*d*x + 1/2*c) - a^2*b)/((a^4 + a^2*b^2)*(a*tan(1/2*d*x + 1/2*c)
^2 - 2*b*tan(1/2*d*x + 1/2*c) - a)^2))/d
```

maple [B] time = 0.53, size = 191, normalized size = 2.01

$$\frac{-\frac{2\left(-\frac{(a^2+2b^2)\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a^2+b^2)a}-\frac{b(a^2-2b^2)\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2(a^2+b^2)a^2}-\frac{(a^2-2b^2)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2(a^2+b^2)a}+\frac{b}{2a^2+2b^2}\right)}{\left(a\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)b-a\right)^2}+\frac{\operatorname{arctanh}\left(\frac{2a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-2b}{2\sqrt{a^2+b^2}}\right)}{(a^2+b^2)^{\frac{3}{2}}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3/(a+b*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(-2*(-1/2*(a^2+2*b^2)/(a^2+b^2)/a*tan(1/2*d*x+1/2*c)^3-1/2*b*(a^2-2*b^2
)/(a^2+b^2)/a^2*tan(1/2*d*x+1/2*c)^2-1/2*(a^2-2*b^2)/(a^2+b^2)/a*tan(1/2*d*
x+1/2*c)+1/2*b/(a^2+b^2))/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)
^2+1/(a^2+b^2)^(3/2)*arctanh(1/2*(2*a*tan(1/2*d*x+1/2*c)-2*b)/(a^2+b^2)^(1/
2)))
```

maxima [B] time = 0.45, size = 326, normalized size = 3.43

$$-\frac{\frac{2\left(a^2b-\frac{(a^3-2ab^2)\sin(dx+c)}{\cos(dx+c)+1}-\frac{(a^2b-2b^3)\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-\frac{(a^3+2ab^2)\sin(dx+c)^3}{(\cos(dx+c)+1)^3}\right)}{a^6+a^4b^2+\frac{4(a^5b+a^3b^3)\sin(dx+c)}{\cos(dx+c)+1}-\frac{2(a^6-a^4b^2-2a^2b^4)\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-\frac{4(a^5b+a^3b^3)\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\frac{(a^6+a^4b^2)\sin(dx+c)^4}{(\cos(dx+c)+1)^4}}+\frac{\log\left(\frac{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}+\sqrt{a^2+b^2}}{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}-\sqrt{a^2+b^2}}\right)}{(a^2+b^2)^{\frac{3}{2}}}}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3/(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/2*(2*(a^2*b - (a^3 - 2*a*b^2)*sin(d*x + c)/(cos(d*x + c) + 1) - (a^2*b -
 2*b^3)*sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - (a^3 + 2*a*b^2)*sin(d*x + c)^
3/(cos(d*x + c) + 1)^3)/(a^6 + a^4*b^2 + 4*(a^5*b + a^3*b^3)*sin(d*x + c)/(
cos(d*x + c) + 1) - 2*(a^6 - a^4*b^2 - 2*a^2*b^4)*sin(d*x + c)^2/(cos(d*x +
 c) + 1)^2 - 4*(a^5*b + a^3*b^3)*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 + (a^6
 + a^4*b^2)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4) + log((b - a*sin(d*x + c)/
(cos(d*x + c) + 1) + sqrt(a^2 + b^2))/(b - a*sin(d*x + c)/(cos(d*x + c) + 1
) - sqrt(a^2 + b^2)))/(a^2 + b^2)^(3/2))/d
```

mupad [B] time = 5.88, size = 260, normalized size = 2.74

$$\frac{\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)(a^2-2\,b^2)}{a\,(a^2+b^2)}-\frac{b}{a^2+b^2}+\frac{\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3(a^2+2\,b^2)}{a\,(a^2+b^2)}+\frac{b\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2(a^2-2\,b^2)}{a^2\,(a^2+b^2)}}{d\left(a^2\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^4-\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^2(2\,a^2-4\,b^2)+a^2-4\,a\,b\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)^3+4\,a\,b\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)}+\frac{\operatorname{atanh}\left(\left(2\,a\tan\cdots\right.\right.}{a\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)^3*(a + b*tan(c + d*x))^3),x)
```

```
[Out] ((tan(c/2 + (d*x)/2)*(a^2 - 2*b^2))/(a*(a^2 + b^2)) - b/(a^2 + b^2) + (tan(
c/2 + (d*x)/2)^3*(a^2 + 2*b^2))/(a*(a^2 + b^2)) + (b*tan(c/2 + (d*x)/2)^2*(
a^2 - 2*b^2))/(a^2*(a^2 + b^2)))/(d*(a^2*tan(c/2 + (d*x)/2)^4 - tan(c/2 + (
d*x)/2)^2*(2*a^2 - 4*b^2) + a^2 - 4*a*b*tan(c/2 + (d*x)/2)^3 + 4*a*b*tan(c/
2 + (d*x)/2))) + atanh(((2*a*tan(c/2 + (d*x)/2) - (2*a^2*b + 2*b^3)/(a^2 +
b^2))*(a^2/2 + b^2/2))/(a^2 + b^2)^(3/2))/(d*(a^2 + b^2)^(3/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec^3(c+dx)}{(a+b\tan(c+dx))^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3/(a+b*tan(d*x+c))**3,x)
```

```
[Out] Integral(sec(c + d*x)**3/(a + b*tan(c + d*x))**3, x)
```

3.575 $\int \frac{\sec(c+dx)}{(a+b\tan(c+dx))^3}\,dx$

Optimal. Leaf size=155

$$-\frac{3ab\sec(c+dx)}{2d\left(a^2+b^2\right)^2(a+b\tan(c+dx))}-\frac{b\sec(c+dx)}{2d\left(a^2+b^2\right)(a+b\tan(c+dx))^2}-\frac{\left(2a^2-b^2\right)\sec(c+dx)\tanh^{-1}\left(\frac{b-a\tan(c+d}{\sqrt{a^2+b^2}\sqrt{\sec^2(}}\right.}{2d\left(a^2+b^2\right)^{5/2}\sqrt{\sec^2(c+dx)}}$$

```
[Out] -1/2*(2*a^2-b^2)*arctanh((b-a*tan(d*x+c))/(a^2+b^2)^(1/2)/(sec(d*x+c)^2)^(1
/2))*sec(d*x+c)/(a^2+b^2)^(5/2)/d/(sec(d*x+c)^2)^(1/2)-1/2*b*sec(d*x+c)/(a^
2+b^2)/d/(a+b*tan(d*x+c))^2-3/2*a*b*sec(d*x+c)/(a^2+b^2)^2/d/(a+b*tan(d*x+c
))
```

Rubi [A] time = 0.11, antiderivative size = 155, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {3512, 745, 807, 725, 206}

$$-\frac{3ab\sec(c+dx)}{2d\left(a^2+b^2\right)^2(a+b\tan(c+dx))}-\frac{b\sec(c+dx)}{2d\left(a^2+b^2\right)(a+b\tan(c+dx))^2}-\frac{\left(2a^2-b^2\right)\sec(c+dx)\tanh^{-1}\left(\frac{b-a\tan(c+d}{\sqrt{a^2+b^2}\sqrt{\sec^2(}}\right.}{2d\left(a^2+b^2\right)^{5/2}\sqrt{\sec^2(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] -((2*a^2 - b^2)*ArcTanh[(b - a*Tan[c + d*x])/(Sqrt[a^2 + b^2]*Sqrt[Sec[c +
d*x]^2])]*Sec[c + d*x])/(2*(a^2 + b^2)^(5/2)*d*Sqrt[Sec[c + d*x]^2]) - (b*S
ec[c + d*x])/(2*(a^2 + b^2)*d*(a + b*Tan[c + d*x])^2) - (3*a*b*Sec[c + d*x]
)/(2*(a^2 + b^2)^2*d*(a + b*Tan[c + d*x]))
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 725

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 745

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/((m + 1)*(c*d^2 + a*e^2)), x] + D
ist[c/((m + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)*Simp[d*(m + 1) - e*(
m + 2*p + 3)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 NeQ[c*d^2 + a*e^2, 0] && NeQ[m, -1] && ((LtQ[m, -1] && IntQuadraticQ[a, 0,
 c, d, e, m, p, x]) || (SumSimplerQ[m, 1] && IntegerQ[p]) || ILtQ[Simplify[
m + 2*p + 3], 0])
```

Rule 807

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> -Simp[((e*f - d*g)*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))
/(2*(p + 1)*(c*d^2 + a*e^2)), x] + Dist[(c*d*f + a*e*g)/(c*d^2 + a*e^2), In
t[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m, p}
```

```
, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] && !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\sec(c+dx)}{(a+b\tan(c+dx))^3}\,dx = \frac{\sec(c+dx)\,\text{Subst}\left(\int \frac{1}{(a+x)^3\sqrt{1+\frac{x^2}{b^2}}}\,dx, x, b\tan(c+dx)\right)}{bd\sqrt{\sec^2(c+dx)}}$$

$$= -\frac{b\sec(c+dx)}{2\left(a^2+b^2\right)d(a+b\tan(c+dx))^2} - \frac{\sec(c+dx)\,\text{Subst}\left(\int \frac{-2a+x}{(a+x)^2\sqrt{1+\frac{x^2}{b^2}}}\,dx, x, b\tan\right.}{2b\left(a^2+b^2\right)d\sqrt{\sec^2(c+dx)}}$$

$$= -\frac{b\sec(c+dx)}{2\left(a^2+b^2\right)d(a+b\tan(c+dx))^2} - \frac{3ab\sec(c+dx)}{2\left(a^2+b^2\right)^2 d(a+b\tan(c+dx))} + \frac{\left(\left(2a^2-\right.\right.}{}$$

$$= -\frac{b\sec(c+dx)}{2\left(a^2+b^2\right)d(a+b\tan(c+dx))^2} - \frac{3ab\sec(c+dx)}{2\left(a^2+b^2\right)^2 d(a+b\tan(c+dx))} - \frac{\left(\left(2a^2-\right.\right.}{}$$

$$= -\frac{\left(2a^2-b^2\right)\tanh^{-1}\left(\frac{b\left(1-\frac{a\tan(c+dx)}{b}\right)}{\sqrt{a^2+b^2}\sqrt{\sec^2(c+dx)}}\right)\sec(c+dx)}{2\left(a^2+b^2\right)^{5/2}d\sqrt{\sec^2(c+dx)}} - \frac{b\sec(c+dx)}{2\left(a^2+b^2\right)d(a+b\tan(c+\right.}$$

Mathematica [A] time = 0.97, size = 110, normalized size = 0.71

$$\frac{\frac{2\left(2a^2-b^2\right)\tanh^{-1}\left(\frac{a\tan\left(\frac{1}{2}(c+dx)\right)-b}{\sqrt{a^2+b^2}}\right)}{\left(a^2+b^2\right)^{5/2}} - \frac{b\sec(c+dx)\left(4a^2+3ab\tan(c+dx)+b^2\right)}{\left(a^2+b^2\right)^2(a+b\tan(c+dx))^2}}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] ((2*(2*a^2 - b^2)*ArcTanh[(-b + a*Tan[(c + d*x)/2])/Sqrt[a^2 + b^2]])/(a^2
+ b^2)^(5/2) - (b*Sec[c + d*x]*(4*a^2 + b^2 + 3*a*b*Tan[c + d*x]))/((a^2 +
b^2)^2*(a + b*Tan[c + d*x])^2))/(2*d)
```

fricas [B] time = 0.83, size = 352, normalized size = 2.27

$$-\frac{\left(2a^2b^2-b^4+\left(2a^4-3a^2b^2+b^4\right)\cos(dx+c)^2+2\left(2a^3b-ab^3\right)\cos(dx+c)\sin(dx+c)\right)\sqrt{a^2+b^2}\log\left(\frac{2ab}{}\right.}{4\left(\left(a^8+2a^6b^2-2a^2b^6-b^8\right)d\cos(dx+c)^2+2\left(a^7b+\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] -1/4*((2*a^2*b^2 - b^4 + (2*a^4 - 3*a^2*b^2 + b^4)*cos(d*x + c)^2 + 2*(2*a^
3*b - a*b^3)*cos(d*x + c)*sin(d*x + c))*sqrt(a^2 + b^2)*log((2*a*b*cos(d*x
+ c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 - 2*a^2 - b^2 - 2*sqrt(a^2 +
 b^2)*(b*cos(d*x + c) - a*sin(d*x + c)))/(2*a*b*cos(d*x + c)*sin(d*x + c) +
 (a^2 - b^2)*cos(d*x + c)^2 + b^2)) + 2*(4*a^4*b + 5*a^2*b^3 + b^5)*cos(d*x
 + c) + 6*(a^3*b^2 + a*b^4)*sin(d*x + c))/((a^8 + 2*a^6*b^2 - 2*a^2*b^6 - b
^8)*d*cos(d*x + c)^2 + 2*(a^7*b + 3*a^5*b^3 + 3*a^3*b^5 + a*b^7)*d*cos(d*x
+ c)*sin(d*x + c) + (a^6*b^2 + 3*a^4*b^4 + 3*a^2*b^6 + b^8)*d)
```

giac [B] time = 3.19, size = 293, normalized size = 1.89

$$-\frac{\frac{\left(2a^2-b^2\right)\log\left(\frac{\left|2a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-2b-2\sqrt{a^2+b^2}\right|}{\left|2a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-2b+2\sqrt{a^2+b^2}\right|}\right)}{\left(a^4+2a^2b^2+b^4\right)\sqrt{a^2+b^2}}-\frac{2\left(5a^3b^2\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3+2ab^4\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3+4a^4b\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-7a^2b^3\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-2\cdots\right.}{\left(a^6+2a^4b^2+a^2b^4\right)\left(a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-2b\cdots\right.}}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -1/2*((2*a^2 - b^2)*log(abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b - 2*sqrt(a^2 + b
^2))/abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b + 2*sqrt(a^2 + b^2)))/((a^4 + 2*a^2
*b^2 + b^4)*sqrt(a^2 + b^2)) - 2*(5*a^3*b^2*tan(1/2*d*x + 1/2*c)^3 + 2*a*b^
4*tan(1/2*d*x + 1/2*c)^3 + 4*a^4*b*tan(1/2*d*x + 1/2*c)^2 - 7*a^2*b^3*tan(1
/2*d*x + 1/2*c)^2 - 2*b^5*tan(1/2*d*x + 1/2*c)^2 - 11*a^3*b^2*tan(1/2*d*x +
 1/2*c) - 2*a*b^4*tan(1/2*d*x + 1/2*c) - 4*a^4*b - a^2*b^3)/((a^6 + 2*a^4*b
^2 + a^2*b^4)*(a*tan(1/2*d*x + 1/2*c)^2 - 2*b*tan(1/2*d*x + 1/2*c) - a)^2))
/d
```

maple [A] time = 0.27, size = 280, normalized size = 1.81

$$\frac{-\frac{2\left(-\frac{b^2\left(5a^2+2b^2\right)\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2a\left(a^4+2a^2b^2+b^4\right)}-\frac{b\left(4a^4-7a^2b^2-2b^4\right)\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2\left(a^4+2a^2b^2+b^4\right)a^2}+\frac{b^2\left(11a^2+2b^2\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2\left(a^4+2a^2b^2+b^4\right)a}+\frac{b\left(4a^2+b^2\right)}{2a^4+4a^2b^2+2b^4}\right)}{\left(a\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)b-a\right)^2}+\frac{\left(2a^2-b^2\right)\operatorname{arctanh}\left(\frac{2a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-2b}{2\sqrt{a^2+b^2}}\right)}{\left(a^4+2a^2b^2+b^4\right)\sqrt{a^2+b^2}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)/(a+b*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(-2*(-1/2*b^2*(5*a^2+2*b^2)/a/(a^4+2*a^2*b^2+b^4)*tan(1/2*d*x+1/2*c)^3-
1/2*b*(4*a^4-7*a^2*b^2-2*b^4)/(a^4+2*a^2*b^2+b^4)/a^2*tan(1/2*d*x+1/2*c)^2+
1/2*b^2*(11*a^2+2*b^2)/(a^4+2*a^2*b^2+b^4)/a*tan(1/2*d*x+1/2*c)+1/2*b*(4*a^
2+b^2)/(a^4+2*a^2*b^2+b^4))/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b-
a)^2+(2*a^2-b^2)/(a^4+2*a^2*b^2+b^4)/(a^2+b^2)^(1/2)*arctanh(1/2*(2*a*tan(1
/2*d*x+1/2*c)-2*b)/(a^2+b^2)^(1/2)))
```

maxima [B] time = 0.45, size = 412, normalized size = 2.66

$$-\frac{\frac{\left(2a^2-b^2\right)\log\left(\frac{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}+\sqrt{a^2+b^2}}{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}-\sqrt{a^2+b^2}}\right)}{\left(a^4+2a^2b^2+b^4\right)\sqrt{a^2+b^2}}+\frac{2\left(4a^4b+a^2b^3+\frac{\left(11a^3b^2+2ab^4\right)\sin(dx+c)}{\cos(dx+c)+1}-\frac{\left(4a^4b-7a^2b^3-2b^5\right)\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-\frac{\left(5a^3b^2+2ab^4\right)\sin(\cdots}{(\cos(dx+c)+1)^3}\cdots\right.}{a^8+2a^6b^2+a^4b^4+\frac{4\left(a^7b+2a^5b^3+a^3b^5\right)\sin(dx+c)}{\cos(dx+c)+1}-\frac{2\left(a^8-3a^4b^4-2a^2b^6\right)\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-\frac{4\left(a^7b+2a^5b^3+a^3b^5\right)\sin(dx+c)^3}{(\cos(dx+c)+1)^3}+\cdots}}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/2*((2*a^2 - b^2)*log((b - a*sin(d*x + c)/(cos(d*x + c) + 1) + sqrt(a^2 +
 b^2))/(b - a*sin(d*x + c)/(cos(d*x + c) + 1) - sqrt(a^2 + b^2)))/((a^4 + 2
*a^2*b^2 + b^4)*sqrt(a^2 + b^2)) + 2*(4*a^4*b + a^2*b^3 + (11*a^3*b^2 + 2*a
*b^4)*sin(d*x + c)/(cos(d*x + c) + 1) - (4*a^4*b - 7*a^2*b^3 - 2*b^5)*sin(d
*x + c)^2/(cos(d*x + c) + 1)^2 - (5*a^3*b^2 + 2*a*b^4)*sin(d*x + c)^3/(cos(
d*x + c) + 1)^3)/(a^8 + 2*a^6*b^2 + a^4*b^4 + 4*(a^7*b + 2*a^5*b^3 + a^3*b^
5)*sin(d*x + c)/(cos(d*x + c) + 1) - 2*(a^8 - 3*a^4*b^4 - 2*a^2*b^6)*sin(d*
x + c)^2/(cos(d*x + c) + 1)^2 - 4*(a^7*b + 2*a^5*b^3 + a^3*b^5)*sin(d*x + c
)^3/(cos(d*x + c) + 1)^3 + (a^8 + 2*a^6*b^2 + a^4*b^4)*sin(d*x + c)^4/(cos(
d*x + c) + 1)^4))/d
```

mupad [B] time = 4.82, size = 443, normalized size = 2.86

$$\frac{\ln\left(\left(a^2+b^2\right)^{5/2}-a^4\,b-b^5-2\,a^2\,b^3+a^5\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+a\,b^4\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)+2\,a^3\,b^2\,\tan\left(\frac{c}{2}+\frac{d\,x}{2}\right)\right)\,\left(a^2-\frac{b^2}{2}\right)}{d\,\left(a^2+b^2\right)^{5/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(cos(c + d*x)*(a + b*tan(c + d*x))^3),x)
```

```
[Out] (log((a^2 + b^2)^(5/2) - a^4*b - b^5 - 2*a^2*b^3 + a^5*tan(c/2 + (d*x)/2) +
 a*b^4*tan(c/2 + (d*x)/2) + 2*a^3*b^2*tan(c/2 + (d*x)/2))*(a^2 - b^2/2))/(d
*(a^2 + b^2)^(5/2)) - (log((a^2 + b^2)^(5/2) + a^4*b + b^5 + 2*a^2*b^3 - a^
5*tan(c/2 + (d*x)/2) - a*b^4*tan(c/2 + (d*x)/2) - 2*a^3*b^2*tan(c/2 + (d*x)
/2))*(2*a^2 - b^2))/(2*d*(a^2 + b^2)^(5/2)) - ((4*a^2*b + b^3)/(a^4 + b^4 +
 2*a^2*b^2) - (tan(c/2 + (d*x)/2)^2*(a^2 - 2*b^2)*(4*a^2*b + b^3))/(a^2*(a^
4 + b^4 + 2*a^2*b^2)) + (b*tan(c/2 + (d*x)/2)*(11*a^2*b + 2*b^3))/(a*(a^4 +
 b^4 + 2*a^2*b^2)) - (b*tan(c/2 + (d*x)/2)^3*(5*a^2*b + 2*b^3))/(a*(a^4 + b
^4 + 2*a^2*b^2)))/(d*(a^2*tan(c/2 + (d*x)/2)^4 - tan(c/2 + (d*x)/2)^2*(2*a^
2 - 4*b^2) + a^2 - 4*a*b*tan(c/2 + (d*x)/2)^3 + 4*a*b*tan(c/2 + (d*x)/2)))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sec(c+dx)}{(a+b\tan(c+dx))^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)/(a+b*tan(d*x+c))**3,x)
```

```
[Out] Integral(sec(c + d*x)/(a + b*tan(c + d*x))**3, x)
```

3.576 $\int \frac{\cos(c+dx)}{(a+b\tan(c+dx))^3}\,dx$

Optimal. Leaf size=221

$$\frac{\cos(c+dx)(a\tan(c+dx)+b)}{d\left(a^2+b^2\right)(a+b\tan(c+dx))^2}+\frac{ab\left(2a^2-13b^2\right)\sec(c+dx)}{2d\left(a^2+b^2\right)^3(a+b\tan(c+dx))}+\frac{b\left(2a^2-3b^2\right)\sec(c+dx)}{2d\left(a^2+b^2\right)^2(a+b\tan(c+dx))^2}-\frac{3b^2\left(4a^2-\right.}{}$$

```
[Out] -3/2*b^2*(4*a^2-b^2)*arctanh((b-a*tan(d*x+c))/(a^2+b^2)^(1/2)/(sec(d*x+c)^2
)^(1/2))*cos(d*x+c)*(sec(d*x+c)^2)^(1/2)/(a^2+b^2)^(7/2)/d+1/2*b*(2*a^2-3*b
^2)*sec(d*x+c)/(a^2+b^2)^2/d/(a+b*tan(d*x+c))^2+cos(d*x+c)*(b+a*tan(d*x+c))
/(a^2+b^2)/d/(a+b*tan(d*x+c))^2+1/2*a*b*(2*a^2-13*b^2)*sec(d*x+c)/(a^2+b^2)
^3/d/(a+b*tan(d*x+c))
```

Rubi [A] time = 0.21, antiderivative size = 221, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.316$, Rules used = {3512, 741, 835, 807, 725, 206}

$$\frac{\cos(c+dx)(a\tan(c+dx)+b)}{d\left(a^2+b^2\right)(a+b\tan(c+dx))^2}+\frac{ab\left(2a^2-13b^2\right)\sec(c+dx)}{2d\left(a^2+b^2\right)^3(a+b\tan(c+dx))}+\frac{b\left(2a^2-3b^2\right)\sec(c+dx)}{2d\left(a^2+b^2\right)^2(a+b\tan(c+dx))^2}-\frac{3b^2\left(4a^2-\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (-3*b^2*(4*a^2 - b^2)*ArcTanh[(b - a*Tan[c + d*x])/(Sqrt[a^2 + b^2]*Sqrt[Se
c[c + d*x]^2])]*Cos[c + d*x]*Sqrt[Sec[c + d*x]^2])/(2*(a^2 + b^2)^(7/2)*d)
+ (b*(2*a^2 - 3*b^2)*Sec[c + d*x])/(2*(a^2 + b^2)^2*d*(a + b*Tan[c + d*x])^
2) + (Cos[c + d*x]*(b + a*Tan[c + d*x]))/((a^2 + b^2)*d*(a + b*Tan[c + d*x]
)^2) + (a*b*(2*a^2 - 13*b^2)*Sec[c + d*x])/(2*(a^2 + b^2)^3*d*(a + b*Tan[c
+ d*x]))
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 725

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 741

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(a*e + c*d*x)*(a + c*x^2)^(p + 1))/(2*a*(p + 1)*(c*d^2
+ a*e^2)), x] + Dist[1/(2*a*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*Simp[
c*d^2*(2*p + 3) + a*e^2*(m + 2*p + 3) + c*e*d*(m + 2*p + 4)*x, x]*(a + c*x^
2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] &&
 LtQ[p, -1] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 807

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> -Simp[((e*f - d*g)*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))
/(2*(p + 1)*(c*d^2 + a*e^2)), x] + Dist[(c*d*f + a*e*g)/(c*d^2 + a*e^2), In
```

```
t[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m, p}
, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0]
```

Rule 835

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[((e*f - d*g)*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/
((m + 1)*(c*d^2 + a*e^2)), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d +
e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 +
a*e^2, 0] && LtQ[m, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*
p])
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos(c+dx)}{(a+b\tan(c+dx))^3}\,dx = \frac{\left(\cos(c+dx)\sqrt{\sec^2(c+dx)}\right)\text{Subst}\left(\int \frac{1}{(a+x)^3\left(1+\frac{x^2}{b^2}\right)^{3/2}}\,dx, x, b\tan(c+dx)\right)}{bd}$$

$$= \frac{\cos(c+dx)(b+a\tan(c+dx))}{\left(a^2+b^2\right)d(a+b\tan(c+dx))^2} - \frac{\left(b\cos(c+dx)\sqrt{\sec^2(c+dx)}\right)\text{Subst}\left(\int \frac{-3-\frac{2}{\ldots}}{(a+x)^3\sqrt{\ldots}} \ldots\right.}{\left(a^2+b^2\right)d}$$

$$= \frac{b\left(2a^2-3b^2\right)\sec(c+dx)}{2\left(a^2+b^2\right)^2 d(a+b\tan(c+dx))^2} + \frac{\cos(c+dx)(b+a\tan(c+dx))}{\left(a^2+b^2\right)d(a+b\tan(c+dx))^2} + \frac{\left(b^3\cos(c+\ldots\right.}{\ldots}$$

$$= \frac{b\left(2a^2-3b^2\right)\sec(c+dx)}{2\left(a^2+b^2\right)^2 d(a+b\tan(c+dx))^2} + \frac{\cos(c+dx)(b+a\tan(c+dx))}{\left(a^2+b^2\right)d(a+b\tan(c+dx))^2} + \frac{ab\left(2a^2\ldots\right.}{2\left(a^2+b^2\right)\ldots}$$

$$= \frac{b\left(2a^2-3b^2\right)\sec(c+dx)}{2\left(a^2+b^2\right)^2 d(a+b\tan(c+dx))^2} + \frac{\cos(c+dx)(b+a\tan(c+dx))}{\left(a^2+b^2\right)d(a+b\tan(c+dx))^2} + \frac{ab\left(2a^2\ldots\right.}{2\left(a^2+b^2\right)\ldots}$$

$$= -\frac{3b^2\left(4a^2-b^2\right)\tanh^{-1}\left(\frac{b\left(1-\frac{a\tan(c+dx)}{b}\right)}{\sqrt{a^2+b^2}\sqrt{\sec^2(c+dx)}}\right)\cos(c+dx)\sqrt{\sec^2(c+dx)}}{2\left(a^2+b^2\right)^{7/2}d} + \frac{b\left(2\ldots\right.}{2\left(a^2+\ldots\right.}$$

Mathematica [A] time = 1.93, size = 183, normalized size = 0.83

$$\frac{\frac{\sec^2(c+dx)\left(b\left(a^2+b^2\right)^2\cos(3(c+dx))+b\left(11a^4-22a^2b^2-3b^4\right)\cos(c+dx)+2a\sin(c+dx)\left(a^4+\left(a^2+b^2\right)^2\cos(2(c+dx))+4a^2b^2-12b^4\right)\right)}{\left(a^2+b^2\right)^3(a+b\tan(c+dx))^2}-\frac{12b^2\left(b^2-4a^2\right)\tanh^{-1}\ldots}{\left(a^2+b^2\right)\ldots}}{4d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] ((-12*b^2*(-4*a^2 + b^2)*ArcTanh[(-b + a*Tan[(c + d*x)/2])/Sqrt[a^2 + b^2]]
)/(a^2 + b^2)^(7/2) + (Sec[c + d*x]^2*(b*(11*a^4 - 22*a^2*b^2 - 3*b^4)*Cos[
c + d*x] + b*(a^2 + b^2)^2*Cos[3*(c + d*x)] + 2*a*(a^4 + 4*a^2*b^2 - 12*b^4
 + (a^2 + b^2)^2*Cos[2*(c + d*x)])*Sin[c + d*x]))/((a^2 + b^2)^3*(a + b*Tan
[c + d*x])^2))/(4*d)
```

fricas [B] time = 0.79, size = 480, normalized size = 2.17

$$\frac{4\left(a^6b+3\,a^4b^3+3\,a^2b^5+b^7\right)\cos\left(dx+c\right)^3-3\left(4\,a^2b^4-b^6+\left(4\,a^4b^2-5\,a^2b^4+b^6\right)\cos\left(dx+c\right)^2+2\left(4\,a^3b^3-ab\ldots\right.\right.}{4\left(\left(a^{10}+3\,a^8b^2+\ldots\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/4*(4*(a^6*b + 3*a^4*b^3 + 3*a^2*b^5 + b^7)*cos(d*x + c)^3 - 3*(4*a^2*b^4
- b^6 + (4*a^4*b^2 - 5*a^2*b^4 + b^6)*cos(d*x + c)^2 + 2*(4*a^3*b^3 - a*b^5
)*cos(d*x + c)*sin(d*x + c))*sqrt(a^2 + b^2)*log((2*a*b*cos(d*x + c)*sin(d*
x + c) + (a^2 - b^2)*cos(d*x + c)^2 - 2*a^2 - b^2 - 2*sqrt(a^2 + b^2)*(b*co
s(d*x + c) - a*sin(d*x + c)))/(2*a*b*cos(d*x + c)*sin(d*x + c) + (a^2 - b^2
)*cos(d*x + c)^2 + b^2)) + 2*(4*a^6*b - 10*a^4*b^3 - 17*a^2*b^5 - 3*b^7)*co
s(d*x + c) + 2*(2*a^5*b^2 - 11*a^3*b^4 - 13*a*b^6 + 2*(a^7 + 3*a^5*b^2 + 3*
a^3*b^4 + a*b^6)*cos(d*x + c)^2)*sin(d*x + c))/((a^10 + 3*a^8*b^2 + 2*a^6*b
^4 - 2*a^4*b^6 - 3*a^2*b^8 - b^10)*d*cos(d*x + c)^2 + 2*(a^9*b + 4*a^7*b^3
+ 6*a^5*b^5 + 4*a^3*b^7 + a*b^9)*d*cos(d*x + c)*sin(d*x + c) + (a^8*b^2 + 4
*a^6*b^4 + 6*a^4*b^6 + 4*a^2*b^8 + b^10)*d)
```

giac [A] time = 2.75, size = 399, normalized size = 1.81

$$-\frac{\frac{3\left(4\,a^2b^2-b^4\right)\log\left(\frac{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2\,b-2\,\sqrt{a^2+b^2}\right|}{\left|2\,a\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-2\,b+2\,\sqrt{a^2+b^2}\right|}\right)}{\left(a^6+3\,a^4b^2+3\,a^2b^4+b^6\right)\sqrt{a^2+b^2}}-\frac{4\left(a^3\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)-3\,ab^2\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)+3\,a^2b-b^3\right)}{\left(a^6+3\,a^4b^2+3\,a^2b^4+b^6\right)\left(\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^2+1\right)}-\frac{2\left(9\,a^3b^4\tan\left(\frac{1}{2}\,dx+\frac{1}{2}\,c\right)^3+2\,ab^6\tan\left(\ldots\right.\right.}{\ldots}}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -1/2*(3*(4*a^2*b^2 - b^4)*log(abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b - 2*sqrt(a
^2 + b^2))/abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b + 2*sqrt(a^2 + b^2)))/((a^6 +
 3*a^4*b^2 + 3*a^2*b^4 + b^6)*sqrt(a^2 + b^2)) - 4*(a^3*tan(1/2*d*x + 1/2*c
) - 3*a*b^2*tan(1/2*d*x + 1/2*c) + 3*a^2*b - b^3)/((a^6 + 3*a^4*b^2 + 3*a^2
*b^4 + b^6)*(tan(1/2*d*x + 1/2*c)^2 + 1)) - 2*(9*a^3*b^4*tan(1/2*d*x + 1/2*
c)^3 + 2*a*b^6*tan(1/2*d*x + 1/2*c)^3 + 8*a^4*b^3*tan(1/2*d*x + 1/2*c)^2 -
15*a^2*b^5*tan(1/2*d*x + 1/2*c)^2 - 2*b^7*tan(1/2*d*x + 1/2*c)^2 - 23*a^3*b
^4*tan(1/2*d*x + 1/2*c) - 2*a*b^6*tan(1/2*d*x + 1/2*c) - 8*a^4*b^3 - a^2*b^
5)/((a^8 + 3*a^6*b^2 + 3*a^4*b^4 + a^2*b^6)*(a*tan(1/2*d*x + 1/2*c)^2 - 2*b
*tan(1/2*d*x + 1/2*c) - a)^2))/d
```

maple [A] time = 0.53, size = 283, normalized size = 1.28

$$-\frac{\frac{2b^2\left(\frac{-\frac{b^2(9a^2+2b^2)\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2a}-\frac{b(8a^4-15a^2b^2-2b^4)\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2a^2}+\frac{b^2(23a^2+2b^2)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2a}+4a^2b+\frac{b^3}{2}}{\left(a\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)b-a\right)^2}-\frac{3(4a^2-b^2)\operatorname{arctanh}\left(\frac{2a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-2b}{2\sqrt{a^2+b^2}}\right)}{2\sqrt{a^2+b^2}}\right)}{(a^2+b^2)^3}-\frac{2((-}{(a^6+3}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)/(a+b*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(-2*b^2/(a^2+b^2)^3*((-1/2*b^2*(9*a^2+2*b^2)/a*tan(1/2*d*x+1/2*c)^3-1/2
*b*(8*a^4-15*a^2*b^2-2*b^4)/a^2*tan(1/2*d*x+1/2*c)^2+1/2*b^2*(23*a^2+2*b^2)
/a*tan(1/2*d*x+1/2*c)+4*a^2*b+1/2*b^3)/(a*tan(1/2*d*x+1/2*c)^2-2*tan(1/2*d*
x+1/2*c)*b-a)^2-3/2*(4*a^2-b^2)/(a^2+b^2)^(1/2)*arctanh(1/2*(2*a*tan(1/2*d*
x+1/2*c)-2*b)/(a^2+b^2)^(1/2)))-2/(a^6+3*a^4*b^2+3*a^2*b^4+b^6)*((-a^3+3*a*
b^2)*tan(1/2*d*x+1/2*c)-3*a^2*b+b^3)/(1+tan(1/2*d*x+1/2*c)^2))
```

maxima [B] time = 0.47, size = 658, normalized size = 2.98

$$-\frac{\frac{3\left(4a^2b^2-b^4\right)\log\left(\frac{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}+\sqrt{a^2+b^2}}{b-\frac{a\sin(dx+c)}{\cos(dx+c)+1}-\sqrt{a^2+b^2}}\right)}{\left(a^6+3a^4b^2+3a^2b^4+b^6\right)\sqrt{a^2+b^2}}-\frac{2\left(6a^6b-10a^4b^3-a^2b^5+\frac{\left(2a^7+18a^5b^2-31a^3b^4-2ab^6\right)\sin(dx+c)}{\cos(dx+c)+1}-\frac{2\left(2a^6b-2a^4b^3+12a^2b^5+b^7\right)\sin(d}{(\cos(dx+c)+1)^2}}{a^{10}+3a^8b^2+3a^6b^4+a^4b^6+\frac{4\left(a^9b+3a^7b^3+3a^5b^5+a^3b^7\right)\sin(dx+c)}{\cos(dx+c)+1}-\frac{\left(a^{10}-a^8b^2-9a^6b^4-11a^4b^6-4a^2b^8\right)\sin(d}{(\cos(dx+c)+1)^2}}}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/2*(3*(4*a^2*b^2 - b^4)*log((b - a*sin(d*x + c)/(cos(d*x + c) + 1) + sqrt
(a^2 + b^2))/(b - a*sin(d*x + c)/(cos(d*x + c) + 1) - sqrt(a^2 + b^2)))/((a
^6 + 3*a^4*b^2 + 3*a^2*b^4 + b^6)*sqrt(a^2 + b^2)) - 2*(6*a^6*b - 10*a^4*b^
3 - a^2*b^5 + (2*a^7 + 18*a^5*b^2 - 31*a^3*b^4 - 2*a*b^6)*sin(d*x + c)/(cos
(d*x + c) + 1) - 2*(2*a^6*b - 2*a^4*b^3 + 12*a^2*b^5 + b^7)*sin(d*x + c)^2/
(cos(d*x + c) + 1)^2 - 2*(2*a^7 + 2*a^5*b^2 + 15*a^3*b^4)*sin(d*x + c)^3/(c
os(d*x + c) + 1)^3 - (2*a^6*b - 30*a^4*b^3 + 15*a^2*b^5 + 2*b^7)*sin(d*x +
c)^4/(cos(d*x + c) + 1)^4 + (2*a^7 - 6*a^5*b^2 + 9*a^3*b^4 + 2*a*b^6)*sin(d
*x + c)^5/(cos(d*x + c) + 1)^5)/(a^10 + 3*a^8*b^2 + 3*a^6*b^4 + a^4*b^6 + 4
*(a^9*b + 3*a^7*b^3 + 3*a^5*b^5 + a^3*b^7)*sin(d*x + c)/(cos(d*x + c) + 1)
- (a^10 - a^8*b^2 - 9*a^6*b^4 - 11*a^4*b^6 - 4*a^2*b^8)*sin(d*x + c)^2/(cos
(d*x + c) + 1)^2 - (a^10 - a^8*b^2 - 9*a^6*b^4 - 11*a^4*b^6 - 4*a^2*b^8)*si
n(d*x + c)^4/(cos(d*x + c) + 1)^4 - 4*(a^9*b + 3*a^7*b^3 + 3*a^5*b^5 + a^3*
b^7)*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 + (a^10 + 3*a^8*b^2 + 3*a^6*b^4 +
a^4*b^6)*sin(d*x + c)^6/(cos(d*x + c) + 1)^6))/d
```

mupad [B] time = 7.32, size = 610, normalized size = 2.76

$$-\frac{\frac{-6a^4b+10a^2b^3+b^5}{a^6+3a^4b^2+3a^2b^4+b^6}+\frac{2\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^3\left(2a^5+2a^3b^2+15ab^4\right)}{a^6+3a^4b^2+3a^2b^4+b^6}+\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^4\left(2a^6b-30a^4b^3+15a^2b^5+2b^7\right)}{a^2\left(a^6+3a^4b^2+3a^2b^4+b^6\right)}-\frac{\tan\left(\frac{c}{2}+\frac{dx}{2}\right)\left(2a^6+18a^4b^2\right.}{a\left(a^6+3a^4b^2+3a^2\right.}}{d\left(a^2\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^6+a^2-\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^2\left(a^2-4b^2\right)-\tan\left(\frac{c}{2}+\frac{dx}{2}\right)^4\left(a^2-\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)/(a + b*tan(c + d*x))^3,x)
```

```
[Out] - ((b^5 - 6*a^4*b + 10*a^2*b^3)/(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2) + (2*ta
n(c/2 + (d*x)/2)^3*(15*a*b^4 + 2*a^5 + 2*a^3*b^2))/(a^6 + b^6 + 3*a^2*b^4 +
 3*a^4*b^2) + (tan(c/2 + (d*x)/2)^4*(2*a^6*b + 2*b^7 + 15*a^2*b^5 - 30*a^4*
b^3))/(a^2*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2)) - (tan(c/2 + (d*x)/2)*(2*a^
6 - 2*b^6 - 31*a^2*b^4 + 18*a^4*b^2))/(a*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2
)) - (tan(c/2 + (d*x)/2)^5*(2*a^6 + 2*b^6 + 9*a^2*b^4 - 6*a^4*b^2))/(a*(a^6
 + b^6 + 3*a^2*b^4 + 3*a^4*b^2)) + (2*tan(c/2 + (d*x)/2)^2*(2*a^6*b + b^7 +
 12*a^2*b^5 - 2*a^4*b^3))/(a^2*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2)))/(d*(a^
2*tan(c/2 + (d*x)/2)^6 + a^2 - tan(c/2 + (d*x)/2)^2*(a^2 - 4*b^2) - tan(c/2
 + (d*x)/2)^4*(a^2 - 4*b^2) - 4*a*b*tan(c/2 + (d*x)/2)^5 + 4*a*b*tan(c/2 +
(d*x)/2))) - (atan((a^6*b*1i + b^7*1i + a^2*b^5*3i + a^4*b^3*3i - a^7*tan(c
/2 + (d*x)/2)*1i - a*b^6*tan(c/2 + (d*x)/2)*1i - a^3*b^4*tan(c/2 + (d*x)/2)
*3i - a^5*b^2*tan(c/2 + (d*x)/2)*3i)/(a^2 + b^2)^(7/2))*(3*b^4 - 12*a^2*b^2
)*1i)/(d*(a^2 + b^2)^(7/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\cos{(c+dx)}}{(a+b\tan{(c+dx)})^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)/(a+b*tan(d*x+c))**3,x)
```

```
[Out] Integral(cos(c + d*x)/(a + b*tan(c + d*x))**3, x)
```

3.577 $\int \frac{\cos^3(c+dx)}{(a+b\tan(c+dx))^3}\,dx$

Optimal. Leaf size=310

$$\frac{\cos^3(c+dx)(a\tan(c+dx)+b)}{3d\left(a^2+b^2\right)(a+b\tan(c+dx))^2}-\frac{\cos(c+dx)\left(b\left(2a^2-5b^2\right)-a\left(2a^2+9b^2\right)\tan(c+dx)\right)}{3d\left(a^2+b^2\right)^2(a+b\tan(c+dx))^2}-\frac{5b^4\left(6a^2-b^2\right)\cos(}{}$$

```
[Out] -5/2*b^4*(6*a^2-b^2)*arctanh((b-a*tan(d*x+c))/(a^2+b^2)^(1/2)/(sec(d*x+c)^2
)^(1/2))*cos(d*x+c)*(sec(d*x+c)^2)^(1/2)/(a^2+b^2)^(9/2)/d+1/6*b*(4*a^4+24*
a^2*b^2-15*b^4)*sec(d*x+c)/(a^2+b^2)^3/d/(a+b*tan(d*x+c))^2+1/3*cos(d*x+c)^
3*(b+a*tan(d*x+c))/(a^2+b^2)/d/(a+b*tan(d*x+c))^2+1/6*a*b*(4*a^4+28*a^2*b^2
-81*b^4)*sec(d*x+c)/(a^2+b^2)^4/d/(a+b*tan(d*x+c))-1/3*cos(d*x+c)*(b*(2*a^2
-5*b^2)-a*(2*a^2+9*b^2)*tan(d*x+c))/(a^2+b^2)^2/d/(a+b*tan(d*x+c))^2
```

Rubi [A] time = 0.38, antiderivative size = 310, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {3512, 741, 823, 835, 807, 725, 206}

$$\frac{\cos^3(c+dx)(a\tan(c+dx)+b)}{3d\left(a^2+b^2\right)(a+b\tan(c+dx))^2}-\frac{\cos(c+dx)\left(b\left(2a^2-5b^2\right)-a\left(2a^2+9b^2\right)\tan(c+dx)\right)}{3d\left(a^2+b^2\right)^2(a+b\tan(c+dx))^2}+\frac{ab\left(28a^2b^2+4a^4-\right.}{6d\left(a^2+b^2\right)^4(a}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (-5*b^4*(6*a^2 - b^2)*ArcTanh[(b - a*Tan[c + d*x])/(Sqrt[a^2 + b^2]*Sqrt[Se
c[c + d*x]^2])]*Cos[c + d*x]*Sqrt[Sec[c + d*x]^2])/(2*(a^2 + b^2)^(9/2)*d)
+ (b*(4*a^4 + 24*a^2*b^2 - 15*b^4)*Sec[c + d*x])/(6*(a^2 + b^2)^3*d*(a + b*
Tan[c + d*x])^2) + (Cos[c + d*x]^3*(b + a*Tan[c + d*x]))/(3*(a^2 + b^2)*d*(
a + b*Tan[c + d*x])^2) + (a*b*(4*a^4 + 28*a^2*b^2 - 81*b^4)*Sec[c + d*x])/(
6*(a^2 + b^2)^4*d*(a + b*Tan[c + d*x])) - (Cos[c + d*x]*(b*(2*a^2 - 5*b^2)
- a*(2*a^2 + 9*b^2)*Tan[c + d*x]))/(3*(a^2 + b^2)^2*d*(a + b*Tan[c + d*x])^
2)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 725

```
Int[1/(((d_) + (e_.)*(x_))*Sqrt[(a_) + (c_.)*(x_)^2]), x_Symbol] :> -Subst[
Int[1/(c*d^2 + a*e^2 - x^2), x], x, (a*e - c*d*x)/Sqrt[a + c*x^2]] /; FreeQ
[{a, c, d, e}, x]
```

Rule 741

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(a*e + c*d*x)*(a + c*x^2)^(p + 1))/(2*a*(p + 1)*(c*d^2
+ a*e^2)), x] + Dist[1/(2*a*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*Simp[
c*d^2*(2*p + 3) + a*e^2*(m + 2*p + 3) + c*e*d*(m + 2*p + 4)*x, x]*(a + c*x^
2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] &&
 LtQ[p, -1] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 807

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> -Simp[((e*f - d*g)*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))
/(2*(p + 1)*(c*d^2 + a*e^2)), x] + Dist[(c*d*f + a*e*g)/(c*d^2 + a*e^2), In
t[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, m, p}
, x] && NeQ[c*d^2 + a*e^2, 0] && EqQ[Simplify[m + 2*p + 3], 0]
```

Rule 823

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_), x_Symbol] :> -Simp[((d + e*x)^(m + 1)*(f*a*c*e - a*g*c*d + c*(c*d*f + a
*e*g)*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)*(c*d^2 + a*e^2)), x] + Dist[1/
(2*a*c*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*(a + c*x^2)^(p + 1)*Simp[f
*(c^2*d^2*(2*p + 3) + a*c*e^2*(m + 2*p + 3)) - a*c*d*e*g*m + c*e*(c*d*f + a
*e*g)*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*
d^2 + a*e^2, 0] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2
*m, 2*p])
```

Rule 835

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[((e*f - d*g)*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/
((m + 1)*(c*d^2 + a*e^2)), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d +
e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 +
a*e^2, 0] && LtQ[m, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*
p])
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\cos^3(c+dx)}{(a+b\tan(c+dx))^3}\,dx = \frac{\left(\cos(c+dx)\sqrt{\sec^2(c+dx)}\right)\text{Subst}\left(\int \frac{1}{(a+x)^3\left(1+\frac{x^2}{b^2}\right)^{5/2}}\,dx, x, b\tan(c+dx)\right)}{bd}$$

$$= \frac{\cos^3(c+dx)(b+a\tan(c+dx))}{3\left(a^2+b^2\right)d(a+b\tan(c+dx))^2} - \frac{\left(b\cos(c+dx)\sqrt{\sec^2(c+dx)}\right)\text{Subst}\left(\int \frac{-5-}{(a+x)^3}\right.}{3\left(a^2+b^2\right)d}$$

$$= \frac{\cos^3(c+dx)(b+a\tan(c+dx))}{3\left(a^2+b^2\right)d(a+b\tan(c+dx))^2} - \frac{\cos(c+dx)\left(b\left(2a^2-5b^2\right)-a\left(2a^2+9b^2\right)\tan\right.}{3\left(a^2+b^2\right)^2 d(a+b\tan(c+dx))^2}$$

$$= \frac{b\left(4a^4+24a^2b^2-15b^4\right)\sec(c+dx)}{6\left(a^2+b^2\right)^3 d(a+b\tan(c+dx))^2} + \frac{\cos^3(c+dx)(b+a\tan(c+dx))}{3\left(a^2+b^2\right)d(a+b\tan(c+dx))^2} - \frac{\cos(c}{}$$

$$= \frac{b\left(4a^4+24a^2b^2-15b^4\right)\sec(c+dx)}{6\left(a^2+b^2\right)^3 d(a+b\tan(c+dx))^2} + \frac{\cos^3(c+dx)(b+a\tan(c+dx))}{3\left(a^2+b^2\right)d(a+b\tan(c+dx))^2} + \frac{ab\left(4a\right.}{6\left(a\right.}$$

$$= \frac{b\left(4a^4+24a^2b^2-15b^4\right)\sec(c+dx)}{6\left(a^2+b^2\right)^3 d(a+b\tan(c+dx))^2} + \frac{\cos^3(c+dx)(b+a\tan(c+dx))}{3\left(a^2+b^2\right)d(a+b\tan(c+dx))^2} + \frac{ab\left(4a\right.}{6\left(a\right.}$$

$$= -\frac{5b^4\left(6a^2-b^2\right)\tanh^{-1}\left(\frac{b\left(1-\frac{a\tan(c+dx)}{b}\right)}{\sqrt{a^2+b^2}\sqrt{\sec^2(c+dx)}}\right)\cos(c+dx)\sqrt{\sec^2(c+dx)}}{2\left(a^2+b^2\right)^{9/2}d} + \frac{b\left(4a^4+\right.}{6\left(a^2+\right.}$$

Mathematica [A] time = 2.00, size = 371, normalized size = 1.20

$$\frac{\sec^2(c+dx)(a\cos(c+dx)+b\sin(c+dx))\left(-\frac{b\left(b^2-3a^2\right)\cos(c+dx)\cos(3(c+dx))(a+b\tan(c+dx))^2}{\left(a^2+b^2\right)^3}+\frac{a\left(a^2-3b^2\right)\sin(3(c+dx))\cos(c}{\left(a^2+b^2\right)^3}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^3/(a + b*Tan[c + d*x])^3,x]
```

```
[Out] (Sec[c + d*x]^2*(a*Cos[c + d*x] + b*Sin[c + d*x])*((9*b*(a^4 + 14*a^2*b^2 -
 3*b^4)*(a*Cos[c + d*x] + b*Sin[c + d*x])^2)/(a^2 + b^2)^4 + (6*b^6*Tan[c +
 d*x])/(a*(a^2 + b^2)^3) + (9*a*(a^4 + 6*a^2*b^2 - 11*b^4)*(a*Cos[c + d*x]
+ b*Sin[c + d*x])^2*Tan[c + d*x])/(a^2 + b^2)^4 - (6*b^5*(12*a^2 + b^2)*(a
+ b*Tan[c + d*x]))/(a*(a^2 + b^2)^4) - (60*b^4*(-6*a^2 + b^2)*ArcTanh[(-b +
 a*Tan[(c + d*x)/2])/Sqrt[a^2 + b^2]]*Cos[c + d*x]*(a + b*Tan[c + d*x])^2)/
(a^2 + b^2)^(9/2) - (b*(-3*a^2 + b^2)*Cos[c + d*x]*Cos[3*(c + d*x)]*(a + b*
Tan[c + d*x])^2)/(a^2 + b^2)^3 + (a*(a^2 - 3*b^2)*Cos[c + d*x]*Sin[3*(c + d
*x)]*(a + b*Tan[c + d*x])^2)/(a^2 + b^2)^3))/(12*d*(a + b*Tan[c + d*x])^3)
```

fricas [B] time = 0.84, size = 619, normalized size = 2.00

$$\frac{4\left(a^8b+4a^6b^3+6a^4b^5+4a^2b^7+b^9\right)\cos(dx+c)^5-4\left(2a^8b+a^6b^3-9a^4b^5-13a^2b^7-5b^9\right)\cos(dx+c)^3-15}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+b*tan(d*x+c))^3,x, algorithm="fricas")
```

```
[Out] 1/12*(4*(a^8*b + 4*a^6*b^3 + 6*a^4*b^5 + 4*a^2*b^7 + b^9)*cos(d*x + c)^5 -
4*(2*a^8*b + a^6*b^3 - 9*a^4*b^5 - 13*a^2*b^7 - 5*b^9)*cos(d*x + c)^3 - 15*
(6*a^2*b^6 - b^8 + (6*a^4*b^4 - 7*a^2*b^6 + b^8)*cos(d*x + c)^2 + 2*(6*a^3*
b^5 - a*b^7)*cos(d*x + c)*sin(d*x + c))*sqrt(a^2 + b^2)*log((2*a*b*cos(d*x
+ c)*sin(d*x + c) + (a^2 - b^2)*cos(d*x + c)^2 - 2*a^2 - b^2 - 2*sqrt(a^2 +
 b^2)*(b*cos(d*x + c) - a*sin(d*x + c)))/(2*a*b*cos(d*x + c)*sin(d*x + c) +
 (a^2 - b^2)*cos(d*x + c)^2 + b^2)) + 2*(8*a^8*b + 64*a^6*b^3 - 16*a^4*b^5
- 87*a^2*b^7 - 15*b^9)*cos(d*x + c) + 2*(4*a^7*b^2 + 32*a^5*b^4 - 53*a^3*b^
6 - 81*a*b^8 + 2*(a^9 + 4*a^7*b^2 + 6*a^5*b^4 + 4*a^3*b^6 + a*b^8)*cos(d*x
+ c)^4 + 2*(2*a^9 + 15*a^7*b^2 + 33*a^5*b^4 + 29*a^3*b^6 + 9*a*b^8)*cos(d*x
 + c)^2)*sin(d*x + c))/((a^12 + 4*a^10*b^2 + 5*a^8*b^4 - 5*a^4*b^8 - 4*a^2*
b^10 - b^12)*d*cos(d*x + c)^2 + 2*(a^11*b + 5*a^9*b^3 + 10*a^7*b^5 + 10*a^5
*b^7 + 5*a^3*b^9 + a*b^11)*d*cos(d*x + c)*sin(d*x + c) + (a^10*b^2 + 5*a^8*
b^4 + 10*a^6*b^6 + 10*a^4*b^8 + 5*a^2*b^10 + b^12)*d)
```

giac [B] time = 4.34, size = 640, normalized size = 2.06

$$-\frac{\frac{15\left(6a^2b^4-b^6\right)\log\left(\frac{\left|2a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-2b-2\sqrt{a^2+b^2}\right|}{\left|2a\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)-2b+2\sqrt{a^2+b^2}\right|}\right)}{\left(a^8+4a^6b^2+6a^4b^4+4a^2b^6+b^8\right)\sqrt{a^2+b^2}}-\frac{6\left(13a^3b^6\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3+2ab^8\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^3+12a^4b^5\tan\left(\frac{1}{2}dx+\frac{1}{2}c\right)^2-23a^2b^7\tan\left(\frac{1}{2}dx\right.\right.}{\left(a^{10}+4a^8b^2+6a^6b^4+4a^4b^6+a^2b^8\right)\left(a\tan\right.}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+b*tan(d*x+c))^3,x, algorithm="giac")
```

```
[Out] -1/6*(15*(6*a^2*b^4 - b^6)*log(abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b - 2*sqrt(
a^2 + b^2))/abs(2*a*tan(1/2*d*x + 1/2*c) - 2*b + 2*sqrt(a^2 + b^2)))/((a^8
+ 4*a^6*b^2 + 6*a^4*b^4 + 4*a^2*b^6 + b^8)*sqrt(a^2 + b^2)) - 6*(13*a^3*b^6
*tan(1/2*d*x + 1/2*c)^3 + 2*a*b^8*tan(1/2*d*x + 1/2*c)^3 + 12*a^4*b^5*tan(1
/2*d*x + 1/2*c)^2 - 23*a^2*b^7*tan(1/2*d*x + 1/2*c)^2 - 2*b^9*tan(1/2*d*x +
 1/2*c)^2 - 35*a^3*b^6*tan(1/2*d*x + 1/2*c) - 2*a*b^8*tan(1/2*d*x + 1/2*c)
- 12*a^4*b^5 - a^2*b^7)/((a^10 + 4*a^8*b^2 + 6*a^6*b^4 + 4*a^4*b^6 + a^2*b^
8)*(a*tan(1/2*d*x + 1/2*c)^2 - 2*b*tan(1/2*d*x + 1/2*c) - a)^2) - 4*(3*a^5*
tan(1/2*d*x + 1/2*c)^5 + 12*a^3*b^2*tan(1/2*d*x + 1/2*c)^5 - 27*a*b^4*tan(1
/2*d*x + 1/2*c)^5 + 9*a^4*b*tan(1/2*d*x + 1/2*c)^4 + 36*a^2*b^3*tan(1/2*d*x
 + 1/2*c)^4 - 9*b^5*tan(1/2*d*x + 1/2*c)^4 + 2*a^5*tan(1/2*d*x + 1/2*c)^3 +
 32*a^3*b^2*tan(1/2*d*x + 1/2*c)^3 - 42*a*b^4*tan(1/2*d*x + 1/2*c)^3 + 60*a
^2*b^3*tan(1/2*d*x + 1/2*c)^2 - 12*b^5*tan(1/2*d*x + 1/2*c)^2 + 3*a^5*tan(1
/2*d*x + 1/2*c) + 12*a^3*b^2*tan(1/2*d*x + 1/2*c) - 27*a*b^4*tan(1/2*d*x +
1/2*c) + 3*a^4*b + 32*a^2*b^3 - 7*b^5)/((a^8 + 4*a^6*b^2 + 6*a^4*b^4 + 4*a^
2*b^6 + b^8)*(tan(1/2*d*x + 1/2*c)^2 + 1)^3))/d
```

maple [A] time = 0.56, size = 457, normalized size = 1.47

$$-\frac{2b^4\left(\frac{-\frac{b^2\left(13a^2+2b^2\right)\left(\tan^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2a}-\frac{b\left(12a^4-23a^2b^2-2b^4\right)\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{2a^2}+\frac{b^2\left(35a^2+2b^2\right)\tan\left(\frac{dx}{2}+\frac{c}{2}\right)}{2a}+6a^2b+\frac{b^3}{2}}{\left(a\left(\tan^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-2\tan\left(\frac{dx}{2}+\frac{c}{2}\right)b-a\right)^2}-\frac{5\left(6a^2-b^2\right)\operatorname{arctanh}\left(\frac{2a\tan\left(\frac{dx}{2}+\frac{c}{2}\right)-2b}{2\sqrt{a^2+b^2}}\right)}{2\sqrt{a^2+b^2}}\right)}{\left(a^2+b^2\right)\left(a^6+3b^2a^4+3b^4a^2+b^6\right)}-\frac{2\left(\left(-a^5-\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3/(a+b*tan(d*x+c))^3,x)
```

```
[Out] 1/d*(-2*b^4/(a^2+b^2)/(a^6+3*a^4*b^2+3*a^2*b^4+b^6)*((-1/2*b^2*(13*a^2+2*b^
2)/a*tan(1/2*d*x+1/2*c)^3-1/2*b*(12*a^4-23*a^2*b^2-2*b^4)/a^2*tan(1/2*d*x+1
/2*c)^2+1/2*b^2*(35*a^2+2*b^2)/a*tan(1/2*d*x+1/2*c)+6*a^2*b+1/2*b^3)/(a*tan
(1/2*d*x+1/2*c)^2-2*tan(1/2*d*x+1/2*c)*b-a)^2-5/2*(6*a^2-b^2)/(a^2+b^2)^(1/
2)*arctanh(1/2*(2*a*tan(1/2*d*x+1/2*c)-2*b)/(a^2+b^2)^(1/2)))-2/(a^6+3*a^4*
b^2+3*a^2*b^4+b^6)/(a^2+b^2)*((-a^5-4*a^3*b^2+9*a*b^4)*tan(1/2*d*x+1/2*c)^5
+(-3*a^4*b-12*a^2*b^3+3*b^5)*tan(1/2*d*x+1/2*c)^4+(-2/3*a^5-32/3*b^2*a^3+14
*a*b^4)*tan(1/2*d*x+1/2*c)^3+(-20*a^2*b^3+4*b^5)*tan(1/2*d*x+1/2*c)^2+(-a^5
-4*a^3*b^2+9*a*b^4)*tan(1/2*d*x+1/2*c)-a^4*b-32/3*a^2*b^3+7/3*b^5)/(1+tan(1
/2*d*x+1/2*c)^2)^3)
```

maxima [B] time = 0.54, size = 1229, normalized size = 3.96

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3/(a+b*tan(d*x+c))^3,x, algorithm="maxima")
```

```
[Out] -1/6*(15*(6*a^2*b^4 - b^6)*log((b - a*sin(d*x + c)/(cos(d*x + c) + 1) + sqr
t(a^2 + b^2))/(b - a*sin(d*x + c)/(cos(d*x + c) + 1) - sqrt(a^2 + b^2)))/((
a^8 + 4*a^6*b^2 + 6*a^4*b^4 + 4*a^2*b^6 + b^8)*sqrt(a^2 + b^2)) - 2*(6*a^8*
b + 64*a^6*b^3 - 50*a^4*b^5 - 3*a^2*b^7 + (6*a^9 + 48*a^7*b^2 + 202*a^5*b^4
 - 161*a^3*b^6 - 6*a*b^8)*sin(d*x + c)/(cos(d*x + c) + 1) + 2*(6*a^8*b + 56
*a^6*b^3 - 14*a^4*b^5 - 67*a^2*b^7 - 3*b^9)*sin(d*x + c)^2/(cos(d*x + c) +
1)^2 - 4*(2*a^9 - 4*a^7*b^2 - 86*a^5*b^4 + 133*a^3*b^6 + 3*a*b^8)*sin(d*x +
 c)^3/(cos(d*x + c) + 1)^3 + 2*(8*a^8*b + 28*a^6*b^3 + 188*a^4*b^5 - 156*a^
2*b^7 - 9*b^9)*sin(d*x + c)^4/(cos(d*x + c) + 1)^4 + 2*(2*a^9 + 4*a^7*b^2 +
 62*a^5*b^4 - 255*a^3*b^6)*sin(d*x + c)^5/(cos(d*x + c) + 1)^5 - 2*(14*a^8*
b + 56*a^6*b^3 - 246*a^4*b^5 + 141*a^2*b^7 + 9*b^9)*sin(d*x + c)^6/(cos(d*x
 + c) + 1)^6 - 4*(2*a^9 + 8*a^7*b^2 + 42*a^5*b^4 + 33*a^3*b^6 - 3*a*b^8)*si
n(d*x + c)^7/(cos(d*x + c) + 1)^7 - 3*(2*a^8*b + 8*a^6*b^3 - 78*a^4*b^5 + 2
3*a^2*b^7 + 2*b^9)*sin(d*x + c)^8/(cos(d*x + c) + 1)^8 + 3*(2*a^9 + 8*a^7*b
^2 - 18*a^5*b^4 + 13*a^3*b^6 + 2*a*b^8)*sin(d*x + c)^9/(cos(d*x + c) + 1)^9
)/(a^12 + 4*a^10*b^2 + 6*a^8*b^4 + 4*a^6*b^6 + a^4*b^8 + 4*(a^11*b + 4*a^9*
b^3 + 6*a^7*b^5 + 4*a^5*b^7 + a^3*b^9)*sin(d*x + c)/(cos(d*x + c) + 1) + (a
^12 + 8*a^10*b^2 + 22*a^8*b^4 + 28*a^6*b^6 + 17*a^4*b^8 + 4*a^2*b^10)*sin(d
*x + c)^2/(cos(d*x + c) + 1)^2 + 8*(a^11*b + 4*a^9*b^3 + 6*a^7*b^5 + 4*a^5*
b^7 + a^3*b^9)*sin(d*x + c)^3/(cos(d*x + c) + 1)^3 - 2*(a^12 - 2*a^10*b^2 -
 18*a^8*b^4 - 32*a^6*b^6 - 23*a^4*b^8 - 6*a^2*b^10)*sin(d*x + c)^4/(cos(d*x
 + c) + 1)^4 - 2*(a^12 - 2*a^10*b^2 - 18*a^8*b^4 - 32*a^6*b^6 - 23*a^4*b^8
- 6*a^2*b^10)*sin(d*x + c)^6/(cos(d*x + c) + 1)^6 - 8*(a^11*b + 4*a^9*b^3 +
 6*a^7*b^5 + 4*a^5*b^7 + a^3*b^9)*sin(d*x + c)^7/(cos(d*x + c) + 1)^7 + (a^
12 + 8*a^10*b^2 + 22*a^8*b^4 + 28*a^6*b^6 + 17*a^4*b^8 + 4*a^2*b^10)*sin(d*
x + c)^8/(cos(d*x + c) + 1)^8 - 4*(a^11*b + 4*a^9*b^3 + 6*a^7*b^5 + 4*a^5*b
^7 + a^3*b^9)*sin(d*x + c)^9/(cos(d*x + c) + 1)^9 + (a^12 + 4*a^10*b^2 + 6*
a^8*b^4 + 4*a^6*b^6 + a^4*b^8)*sin(d*x + c)^10/(cos(d*x + c) + 1)^10))/d
```

mupad [B] time = 8.83, size = 1128, normalized size = 3.64

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3/(a + b*tan(c + d*x))^3,x)
```

```
[Out] ((2*tan(c/2 + (d*x)/2)^5*(2*a^7 - 255*a*b^6 + 62*a^3*b^4 + 4*a^5*b^2))/(3*(
a^8 + b^8 + 4*a^2*b^6 + 6*a^4*b^4 + 4*a^6*b^2)) + (6*a^6*b - 3*b^7 - 50*a^2
```

```
*b^5 + 64*a^4*b^3)/(3*(a^2 + b^2)*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2)) + (2
*tan(c/2 + (d*x)/2)^2*(6*a^6*b - 3*b^7 - 64*a^2*b^5 + 50*a^4*b^3))/(3*a^2*(
a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2)) + (tan(c/2 + (d*x)/2)^9*(2*a^8 + 2*b^8
+ 13*a^2*b^6 - 18*a^4*b^4 + 8*a^6*b^2))/(a*(a^8 + b^8 + 4*a^2*b^6 + 6*a^4*b
^4 + 4*a^6*b^2)) - (4*tan(c/2 + (d*x)/2)^7*(2*a^6 - 3*b^6 + 36*a^2*b^4 + 6*
a^4*b^2))/(3*a*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2)) - (tan(c/2 + (d*x)/2)^8
*(2*a^8*b + 2*b^9 + 23*a^2*b^7 - 78*a^4*b^5 + 8*a^6*b^3))/(a^2*(a^8 + b^8 +
 4*a^2*b^6 + 6*a^4*b^4 + 4*a^6*b^2)) + (2*tan(c/2 + (d*x)/2)^4*(8*a^8*b - 9
*b^9 - 156*a^2*b^7 + 188*a^4*b^5 + 28*a^6*b^3))/(3*a^2*(a^2 + b^2)*(a^6 + b
^6 + 3*a^2*b^4 + 3*a^4*b^2)) - (2*tan(c/2 + (d*x)/2)^6*(14*a^8*b + 9*b^9 +
141*a^2*b^7 - 246*a^4*b^5 + 56*a^6*b^3))/(3*a^2*(a^2 + b^2)*(a^6 + b^6 + 3*
a^2*b^4 + 3*a^4*b^2)) + (tan(c/2 + (d*x)/2)*(6*a^8 - 6*b^8 - 161*a^2*b^6 +
202*a^4*b^4 + 48*a^6*b^2))/(3*a*(a^2 + b^2)*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*
b^2)) - (4*tan(c/2 + (d*x)/2)^3*(2*a^8 + 3*b^8 + 133*a^2*b^6 - 86*a^4*b^4 -
 4*a^6*b^2))/(3*a*(a^2 + b^2)*(a^6 + b^6 + 3*a^2*b^4 + 3*a^4*b^2)))/(d*(a^2
*tan(c/2 + (d*x)/2)^10 - tan(c/2 + (d*x)/2)^6*(2*a^2 - 12*b^2) - tan(c/2 +
(d*x)/2)^4*(2*a^2 - 12*b^2) + a^2 + tan(c/2 + (d*x)/2)^2*(a^2 + 4*b^2) + ta
n(c/2 + (d*x)/2)^8*(a^2 + 4*b^2) + 8*a*b*tan(c/2 + (d*x)/2)^3 - 8*a*b*tan(c
/2 + (d*x)/2)^7 - 4*a*b*tan(c/2 + (d*x)/2)^9 + 4*a*b*tan(c/2 + (d*x)/2))) +
 (b^4*atan((a^8*b*1i + b^9*1i + a^2*b^7*4i + a^4*b^5*6i + a^6*b^3*4i - a^9*
tan(c/2 + (d*x)/2)*1i - a*b^8*tan(c/2 + (d*x)/2)*1i - a^3*b^6*tan(c/2 + (d*
x)/2)*4i - a^5*b^4*tan(c/2 + (d*x)/2)*6i - a^7*b^2*tan(c/2 + (d*x)/2)*4i)/(
a^2 + b^2)^(9/2))*(6*a^2 - b^2)*5i)/(d*(a^2 + b^2)^(9/2))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3/(a+b*tan(d*x+c))**3,x)
```

```
[Out] Timed out
```

3.578 $\int (d\sec(e+fx))^{7/2}(a+b\tan(e+fx))\,dx$

Optimal. Leaf size=121

$$-\frac{6ad^4E\left(\frac{1}{2}(e+fx)\middle|2\right)}{5f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}}+\frac{6ad^3\sin(e+fx)\sqrt{d\sec(e+fx)}}{5f}+\frac{2ad\sin(e+fx)(d\sec(e+fx))^{5/2}}{5f}+\frac{2b(d\,$$

```
[Out] 2/7*b*(d*sec(f*x+e))^(7/2)/f+2/5*a*d*(d*sec(f*x+e))^(5/2)*sin(f*x+e)/f-6/5*
a*d^4*(cos(1/2*e+1/2*f*x)^2)^(1/2)/cos(1/2*e+1/2*f*x)*EllipticE(sin(1/2*e+1
/2*f*x),2^(1/2))/f/cos(f*x+e)^(1/2)/(d*sec(f*x+e))^(1/2)+6/5*a*d^3*sin(f*x+
e)*(d*sec(f*x+e))^(1/2)/f
```

Rubi [A] time = 0.09, antiderivative size = 121, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {3486, 3768, 3771, 2639}

$$\frac{6ad^3\sin(e+fx)\sqrt{d\sec(e+fx)}}{5f}-\frac{6ad^4E\left(\frac{1}{2}(e+fx)\middle|2\right)}{5f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}}+\frac{2ad\sin(e+fx)(d\sec(e+fx))^{5/2}}{5f}+\frac{2b(d\,\mathrm{se}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(7/2)*(a + b*Tan[e + f*x]),x]
```

```
[Out] (-6*a*d^4*EllipticE[(e + f*x)/2, 2])/(5*f*Sqrt[Cos[e + f*x]]*Sqrt[d*Sec[e +
 f*x]]) + (2*b*(d*Sec[e + f*x])^(7/2))/(7*f) + (6*a*d^3*Sqrt[d*Sec[e + f*x]
]*Sin[e + f*x])/(5*f) + (2*a*d*(d*Sec[e + f*x])^(5/2)*Sin[e + f*x])/(5*f)
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int (d\sec(e+fx))^{7/2}(a+b\tan(e+fx))\,dx = \frac{2b(d\sec(e+fx))^{7/2}}{7f} + a\int (d\sec(e+fx))^{7/2}\,dx$$
$$= \frac{2b(d\sec(e+fx))^{7/2}}{7f} + \frac{2ad(d\sec(e+fx))^{5/2}\sin(e+fx)}{5f} + \frac{1}{5}\left(3ad^2\right)$$
$$= \frac{2b(d\sec(e+fx))^{7/2}}{7f} + \frac{6ad^3\sqrt{d\sec(e+fx)}\,\sin(e+fx)}{5f} + \frac{2ad(d\sec(}{}$$
$$= \frac{2b(d\sec(e+fx))^{7/2}}{7f} + \frac{6ad^3\sqrt{d\sec(e+fx)}\,\sin(e+fx)}{5f} + \frac{2ad(d\sec(}{}$$
$$= -\frac{6ad^4E\left(\frac{1}{2}(e+fx)\middle|2\right)}{5f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}} + \frac{2b(d\sec(e+fx))^{7/2}}{7f} + \frac{6ad^3\sqrt{d}}{}$$

Mathematica [A] time = 0.62, size = 69, normalized size = 0.57

$$\frac{(d\sec(e+fx))^{7/2}\left(70a\sin(2(e+fx)) + 21a\sin(4(e+fx)) - 168a\cos^{\frac{7}{2}}(e+fx)E\left(\frac{1}{2}(e+fx)\middle|2\right) + 40b\right)}{140f}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(7/2)*(a + b*Tan[e + f*x]),x]
```

```
[Out] ((d*Sec[e + f*x])^(7/2)*(40*b - 168*a*Cos[e + f*x]^(7/2)*EllipticE[(e + f*x
)/2, 2] + 70*a*Sin[2*(e + f*x)] + 21*a*Sin[4*(e + f*x)]))/(140*f)
```

fricas [F] time = 0.69, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\left(bd^3\sec\left(fx+e\right)^3\tan\left(fx+e\right) + ad^3\sec\left(fx+e\right)^3\right)\sqrt{d\sec\left(fx+e\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(7/2)*(a+b*tan(f*x+e)),x, algorithm="fricas")
```

```
[Out] integral((b*d^3*sec(f*x + e)^3*tan(f*x + e) + a*d^3*sec(f*x + e)^3)*sqrt(d*
sec(f*x + e)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{7}{2}}\left(b\tan\left(fx+e\right)+a\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(7/2)*(a+b*tan(f*x+e)),x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(7/2)*(b*tan(f*x + e) + a), x)
```

maple [C] time = 0.92, size = 371, normalized size = 3.07

$$\frac{2\left(1+\cos\left(fx+e\right)\right)^2\left(-1+\cos\left(fx+e\right)\right)^2\left(21i\left(\cos^4\left(fx+e\right)\right)\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\sqrt{\frac{\cos\left(fx+e\right)}{1+\cos\left(fx+e\right)}}\operatorname{EllipticE}\left(\frac{i\left(-1+\cos\left(fx+\right.\right.}{\sin\left(fx+e\right)}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(7/2)*(a+b*tan(f*x+e)),x)
```

```
[Out] 2/35/f*(1+cos(f*x+e))^2*(-1+cos(f*x+e))^2*(21*I*cos(f*x+e)^4*(1/(1+cos(f*x+
e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticE(I*(-1+cos(f*x+e))/si
n(f*x+e),I)*sin(f*x+e)*a-21*I*cos(f*x+e)^4*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*
x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*sin(f*
x+e)*a+21*I*cos(f*x+e)^3*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)
))^(1/2)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*sin(f*x+e)*a-21*I*cos(f*
x+e)^3*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF
(I*(-1+cos(f*x+e))/sin(f*x+e),I)*sin(f*x+e)*a-21*a*cos(f*x+e)^4+14*a*cos(f*
x+e)^3+7*a*cos(f*x+e)+5*b*sin(f*x+e))*(d/cos(f*x+e))^(7/2)/sin(f*x+e)^5
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d \sec\left(fx + e\right)\right)^{\frac{7}{2}} \left(b \tan\left(fx + e\right) + a\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(7/2)*(a+b*tan(f*x+e)),x, algorithm="maxima")
```

```
[Out] integrate((d*sec(f*x + e))^(7/2)*(b*tan(f*x + e) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(\frac{d}{\cos\left(e + f\,x\right)}\right)^{7/2} \left(a + b\tan\left(e + f\,x\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(7/2)*(a + b*tan(e + f*x)),x)
```

```
[Out] int((d/cos(e + f*x))^(7/2)*(a + b*tan(e + f*x)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(7/2)*(a+b*tan(f*x+e)),x)
```

```
[Out] Timed out
```

3.579 $\int (d\sec(e+fx))^{5/2}(a+b\tan(e+fx))\,dx$

Optimal. Leaf size=92

$$\frac{2ad^2\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx)}}{3f}+\frac{2ad\sin(e+fx)(d\sec(e+fx))^{3/2}}{3f}+\frac{2b(d\sec(e+fx))^{5/2}}{5f}$$

```
[Out] 2/5*b*(d*sec(f*x+e))^(5/2)/f+2/3*a*d*(d*sec(f*x+e))^(3/2)*sin(f*x+e)/f+2/3*
a*d^2*(cos(1/2*e+1/2*f*x)^2)^(1/2)/cos(1/2*e+1/2*f*x)*EllipticF(sin(1/2*e+1
/2*f*x),2^(1/2))*cos(f*x+e)^(1/2)*(d*sec(f*x+e))^(1/2)/f
```

Rubi [A] time = 0.07, antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used = {3486, 3768, 3771, 2641}

$$\frac{2ad^2\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx)}}{3f}+\frac{2ad\sin(e+fx)(d\sec(e+fx))^{3/2}}{3f}+\frac{2b(d\sec(e+fx))^{5/2}}{5f}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(5/2)*(a + b*Tan[e + f*x]),x]
```

```
[Out] (2*a*d^2*Sqrt[Cos[e + f*x]]*EllipticF[(e + f*x)/2, 2]*Sqrt[d*Sec[e + f*x]])
/(3*f) + (2*b*(d*Sec[e + f*x])^(5/2))/(5*f) + (2*a*d*(d*Sec[e + f*x])^(3/2)
*Sin[e + f*x])/(3*f)
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int (d\sec(e+fx))^{5/2}(a+b\tan(e+fx))\,dx = \frac{2b(d\sec(e+fx))^{5/2}}{5f} + a\int (d\sec(e+fx))^{5/2}\,dx$$
$$= \frac{2b(d\sec(e+fx))^{5/2}}{5f} + \frac{2ad(d\sec(e+fx))^{3/2}\sin(e+fx)}{3f} + \frac{1}{3}\left(ad^2\right.$$
$$= \frac{2b(d\sec(e+fx))^{5/2}}{5f} + \frac{2ad(d\sec(e+fx))^{3/2}\sin(e+fx)}{3f} + \frac{1}{3}\left(ad^2\right.$$
$$= \frac{2ad^2\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx)}}{3f} + \frac{2b(d\sec(e\,-}{5f}$$

Mathematica [A] time = 0.41, size = 58, normalized size = 0.63

$$\frac{(d\sec(e+fx))^{5/2}\left(5a\sin(2(e+fx))+10a\cos^{\frac{5}{2}}(e+fx)F\left(\frac{1}{2}(e+fx)\middle|2\right)+6b\right)}{15f}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(5/2)*(a + b*Tan[e + f*x]),x]
```

```
[Out] ((d*Sec[e + f*x])^(5/2)*(6*b + 10*a*Cos[e + f*x]^(5/2)*EllipticF[(e + f*x)/
2, 2] + 5*a*Sin[2*(e + f*x)]))/(15*f)
```

fricas [F] time = 0.73, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\left(bd^2\sec\left(fx+e\right)^2\tan\left(fx+e\right)+ad^2\sec\left(fx+e\right)^2\right)\sqrt{d\sec\left(fx+e\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/2)*(a+b*tan(f*x+e)),x, algorithm="fricas")
```

```
[Out] integral((b*d^2*sec(f*x + e)^2*tan(f*x + e) + a*d^2*sec(f*x + e)^2)*sqrt(d*
sec(f*x + e)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{5}{2}}\left(b\tan\left(fx+e\right)+a\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/2)*(a+b*tan(f*x+e)),x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(5/2)*(b*tan(f*x + e) + a), x)
```

maple [C] time = 0.83, size = 195, normalized size = 2.12

$$2\left(1+\cos\left(fx+e\right)\right)^2\left(-1+\cos\left(fx+e\right)\right)^2\left(5i\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\sqrt{\frac{\cos\left(fx+e\right)}{1+\cos\left(fx+e\right)}}\left(\cos^3\left(fx+e\right)\right)\mathrm{EllipticF}\left(\frac{i\left(-1+\cos\left(f\right.\right.}{\sin\left(fx+e\right.}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(5/2)*(a+b*tan(f*x+e)),x)
```

```
[Out] 2/15/f*(1+cos(f*x+e))^2*(-1+cos(f*x+e))^2*(5*I*(1/(1+cos(f*x+e)))^(1/2)*(co
s(f*x+e)/(1+cos(f*x+e)))^(1/2)*cos(f*x+e)^3*EllipticF(I*(-1+cos(f*x+e))/sin
```

```
(f*x+e),I)*a+5*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)
*cos(f*x+e)^2*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a+5*cos(f*x+e)*sin(
f*x+e)*a+3*b)*(d/cos(f*x+e))^(5/2)/sin(f*x+e)^4
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{5}{2}}\left(b\tan\left(fx+e\right)+a\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/2)*(a+b*tan(f*x+e)),x, algorithm="maxima")
[Out] integrate((d*sec(f*x + e))^(5/2)*(b*tan(f*x + e) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{5/2}\,\left(a+b\,\mathrm{tan}\left(e+f\,x\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(5/2)*(a + b*tan(e + f*x)),x)
[Out] int((d/cos(e + f*x))^(5/2)*(a + b*tan(e + f*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(e+fx\right)\right)^{\frac{5}{2}}\left(a+b\tan\left(e+fx\right)\right)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(5/2)*(a+b*tan(f*x+e)),x)
[Out] Integral((d*sec(e + f*x))**(5/2)*(a + b*tan(e + f*x)), x)
```

3.580 $\int (d\sec(e+fx))^{3/2}(a+b\tan(e+fx))\,dx$

Optimal. Leaf size=88

$$-\frac{2ad^2E\left(\frac{1}{2}(e+fx)\middle|2\right)}{f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}}+\frac{2ad\sin(e+fx)\sqrt{d\sec(e+fx)}}{f}+\frac{2b(d\sec(e+fx))^{3/2}}{3f}$$

```
[Out] 2/3*b*(d*sec(f*x+e))^(3/2)/f-2*a*d^2*(cos(1/2*e+1/2*f*x)^2)^(1/2)/cos(1/2*e
+1/2*f*x)*EllipticE(sin(1/2*e+1/2*f*x),2^(1/2))/f/cos(f*x+e)^(1/2)/(d*sec(f
*x+e))^(1/2)+2*a*d*sin(f*x+e)*(d*sec(f*x+e))^(1/2)/f
```

Rubi [A] time = 0.07, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used = {3486, 3768, 3771, 2639}

$$-\frac{2ad^2E\left(\frac{1}{2}(e+fx)\middle|2\right)}{f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}}+\frac{2ad\sin(e+fx)\sqrt{d\sec(e+fx)}}{f}+\frac{2b(d\sec(e+fx))^{3/2}}{3f}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(3/2)*(a + b*Tan[e + f*x]),x]
```

```
[Out] (-2*a*d^2*EllipticE[(e + f*x)/2, 2])/(f*Sqrt[Cos[e + f*x]]*Sqrt[d*Sec[e + f
*x]]) + (2*b*(d*Sec[e + f*x])^(3/2))/(3*f) + (2*a*d*Sqrt[d*Sec[e + f*x]]*Si
n[e + f*x])/f
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int (d\sec(e+fx))^{3/2}(a+b\tan(e+fx))\,dx = \frac{2b(d\sec(e+fx))^{3/2}}{3f} + a\int (d\sec(e+fx))^{3/2}\,dx$$
$$= \frac{2b(d\sec(e+fx))^{3/2}}{3f} + \frac{2ad\sqrt{d\sec(e+fx)}\,\sin(e+fx)}{f} - \left(ad^2\right)\int \frac{}{\sqrt{c}}$$
$$= \frac{2b(d\sec(e+fx))^{3/2}}{3f} + \frac{2ad\sqrt{d\sec(e+fx)}\,\sin(e+fx)}{f} - \frac{\left(ad^2\right)\int \sqrt{}}{\sqrt{\cos(e+f}}$$
$$= -\frac{2ad^2E\left(\frac{1}{2}(e+fx)\middle|2\right)}{f\sqrt{\cos(e+fx)}\,\sqrt{d\sec(e+fx)}} + \frac{2b(d\sec(e+fx))^{3/2}}{3f} + \frac{2ad\sqrt{d\,\mathrm{se}}}{}$$

Mathematica [A] time = 0.29, size = 58, normalized size = 0.66

$$\frac{(d\sec(e+fx))^{3/2}\left(3a\sin(2(e+fx)) - 6a\cos^{\frac{3}{2}}(e+fx)E\left(\frac{1}{2}(e+fx)\middle|2\right) + 2b\right)}{3f}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(3/2)*(a + b*Tan[e + f*x]),x]
```

```
[Out] ((d*Sec[e + f*x])^(3/2)*(2*b - 6*a*Cos[e + f*x]^(3/2)*EllipticE[(e + f*x)/2
, 2] + 3*a*Sin[2*(e + f*x)]))/(3*f)
```

fricas [F] time = 0.65, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\left(bd\sec\left(fx+e\right)\tan\left(fx+e\right) + ad\sec\left(fx+e\right)\right)\sqrt{d\sec\left(fx+e\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(3/2)*(a+b*tan(f*x+e)),x, algorithm="fricas")
```

```
[Out] integral((b*d*sec(f*x + e)*tan(f*x + e) + a*d*sec(f*x + e))*sqrt(d*sec(f*x
+ e)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{3}{2}}\left(b\tan\left(fx+e\right)+a\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(3/2)*(a+b*tan(f*x+e)),x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(3/2)*(b*tan(f*x + e) + a), x)
```

maple [C] time = 0.80, size = 356, normalized size = 4.05

$$-\frac{2\left(1+\cos\left(fx+e\right)\right)^{2}\left(-1+\cos\left(fx+e\right)\right)^{2}\left(3i\left(\cos^{2}\left(fx+e\right)\right)\sin\left(fx+e\right)\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\,\sqrt{\frac{\cos\left(fx+e\right)}{1+\cos\left(fx+e\right)}}\ \mathrm{EllipticF}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(3/2)*(a+b*tan(f*x+e)),x)
```

```
[Out] -2/3/f*(1+cos(f*x+e))^2*(-1+cos(f*x+e))^2*(3*I*cos(f*x+e)^2*sin(f*x+e)*(1/(
1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(
f*x+e))/sin(f*x+e),I)*a-3*I*cos(f*x+e)^2*sin(f*x+e)*(1/(1+cos(f*x+e)))^(1/2
)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),
I)*a+3*I*cos(f*x+e)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1
/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a*sin(f*x+e)-3*I*cos(f*x+e)*(
1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticE(I*(-1+c
os(f*x+e))/sin(f*x+e),I)*a*sin(f*x+e)+3*cos(f*x+e)^2*a-3*a*cos(f*x+e)-b*sin
(f*x+e))*(d/cos(f*x+e))^(3/2)/sin(f*x+e)^5
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d \sec\left(fx+e\right)\right)^{\frac{3}{2}} \left(b \tan\left(fx+e\right)+a\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(3/2)*(a+b*tan(f*x+e)),x, algorithm="maxima")
[Out] integrate((d*sec(f*x + e))^(3/2)*(b*tan(f*x + e) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{3/2}\,\left(a+b\,\tan\left(e+f\,x\right)\right) \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(3/2)*(a + b*tan(e + f*x)),x)
[Out] int((d/cos(e + f*x))^(3/2)*(a + b*tan(e + f*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d \sec\left(e+fx\right)\right)^{\frac{3}{2}} \left(a+b \tan\left(e+fx\right)\right)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(3/2)*(a+b*tan(f*x+e)),x)
[Out] Integral((d*sec(e + f*x))**(3/2)*(a + b*tan(e + f*x)), x)
```

3.581 $\int \sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))\,dx$

Optimal. Leaf size=58

$$\frac{2a\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx)}}{f}+\frac{2b\sqrt{d\sec(e+fx)}}{f}$$

```
[Out] 2*b*(d*sec(f*x+e))^(1/2)/f+2*a*(cos(1/2*e+1/2*f*x)^2)^(1/2)/cos(1/2*e+1/2*f
*x)*EllipticF(sin(1/2*e+1/2*f*x),2^(1/2))*cos(f*x+e)^(1/2)*(d*sec(f*x+e))^(
1/2)/f
```

Rubi [A] time = 0.05, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {3486, 3771, 2641}

$$\frac{2a\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx)}}{f}+\frac{2b\sqrt{d\sec(e+fx)}}{f}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x]),x]
```

```
[Out] (2*b*Sqrt[d*Sec[e + f*x]])/f + (2*a*Sqrt[Cos[e + f*x]]*EllipticF[(e + f*x)/
2, 2]*Sqrt[d*Sec[e + f*x]])/f
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\begin{aligned}\int \sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))\,dx&=\frac{2b\sqrt{d\sec(e+fx)}}{f}+a\int \sqrt{d\sec(e+fx)}\,dx\\&=\frac{2b\sqrt{d\sec(e+fx)}}{f}+\left(a\sqrt{\cos(e+fx)}\,\sqrt{d\sec(e+fx)}\right)\int \frac{1}{\sqrt{\cos(e+fx)}}\\&=\frac{2b\sqrt{d\sec(e+fx)}}{f}+\frac{2a\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx)}}{f}\end{aligned}$$

Mathematica [A] time = 0.20, size = 42, normalized size = 0.72

$$\frac{2\sqrt{d\sec(e+fx)}\left(a\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)+b\right)}{f}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x]),x]
```

```
[Out] (2*(b + a*Sqrt[Cos[e + f*x]]*EllipticF[(e + f*x)/2, 2])*Sqrt[d*Sec[e + f*x]
])/f
```

fricas [F] time = 0.61, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\sqrt{d\sec\left(fx+e\right)}\left(b\tan\left(fx+e\right)+a\right),x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/2)*(a+b*tan(f*x+e)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(d*sec(f*x + e))*(b*tan(f*x + e) + a), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{d\sec\left(fx+e\right)}\left(b\tan\left(fx+e\right)+a\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/2)*(a+b*tan(f*x+e)),x, algorithm="giac")
```

```
[Out] integrate(sqrt(d*sec(f*x + e))*(b*tan(f*x + e) + a), x)
```

maple [C] time = 0.89, size = 168, normalized size = 2.90

$$\frac{2\sqrt{\frac{d}{\cos\left(fx+e\right)}}\left(1+\cos\left(fx+e\right)\right)^{2}\left(-1+\cos\left(fx+e\right)\right)^{2}\left(i\,\mathrm{EllipticF}\left(\frac{i\left(-1+\cos\left(fx+e\right)\right)}{\sin\left(fx+e\right)},i\right)\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\sqrt{\frac{\cos\left(fx+e\right)}{1+\cos\left(fx+e\right)}}\right.}{f\sin\left(fx+e\right)^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(1/2)*(a+b*tan(f*x+e)),x)
```

```
[Out] 2/f*(d/cos(f*x+e))^(1/2)*(1+cos(f*x+e))^2*(-1+cos(f*x+e))^2*(I*EllipticF(I*
(-1+cos(f*x+e))/sin(f*x+e),I)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f
*x+e)))^(1/2)*cos(f*x+e)*a+I*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(1/(
1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a+b)/sin(f*x+e)^4
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{d\sec\left(fx+e\right)}\left(b\tan\left(fx+e\right)+a\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/2)*(a+b*tan(f*x+e)),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(d*sec(f*x + e))*(b*tan(f*x + e) + a), x)
```

mupad [B] time = 0.36, size = 39, normalized size = 0.67

$$\frac{2\left(b+a\sqrt{\cos\left(e+f\,x\right)}\,\mathrm{F}\left(\frac{e}{2}+\frac{f\,x}{2}\middle|2\right)\right)\sqrt{\frac{d}{\cos\left(e+f\,x\right)}}}{f}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(1/2)*(a + b*tan(e + f*x)),x)
```

```
[Out] (2*(b + a*cos(e + f*x)^(1/2)*ellipticF(e/2 + (f*x)/2, 2))*(d/cos(e + f*x))^
(1/2))/f
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{d \sec \left(e + fx\right)} \left(a + b \tan \left(e + fx\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(1/2)*(a+b*tan(f*x+e)),x)
```

```
[Out] Integral(sqrt(d*sec(e + f*x))*(a + b*tan(e + f*x)), x)
```

3.582 $\int \frac{a+b\tan(e+fx)}{\sqrt{d\sec(e+fx)}}\,dx$

Optimal. Leaf size=58

$$\frac{2aE\left(\frac{1}{2}(e+fx)\middle|2\right)}{f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}}-\frac{2b}{f\sqrt{d\sec(e+fx)}}$$

```
[Out] -2*b/f/(d*sec(f*x+e))^(1/2)+2*a*(cos(1/2*e+1/2*f*x)^2)^(1/2)/cos(1/2*e+1/2*
f*x)*EllipticE(sin(1/2*e+1/2*f*x),2^(1/2))/f/cos(f*x+e)^(1/2)/(d*sec(f*x+e)
)^(1/2)
```

Rubi [A] time = 0.05, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {3486, 3771, 2639}

$$\frac{2aE\left(\frac{1}{2}(e+fx)\middle|2\right)}{f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}}-\frac{2b}{f\sqrt{d\sec(e+fx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Tan[e + f*x])/Sqrt[d*Sec[e + f*x]],x]
```

```
[Out] (-2*b)/(f*Sqrt[d*Sec[e + f*x]]) + (2*a*EllipticE[(e + f*x)/2, 2])/(f*Sqrt[C
os[e + f*x]]*Sqrt[d*Sec[e + f*x]])
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\tan(e+fx)}{\sqrt{d\sec(e+fx)}}\,dx &= -\frac{2b}{f\sqrt{d\sec(e+fx)}}+a\int \frac{1}{\sqrt{d\sec(e+fx)}}\,dx\\ &= -\frac{2b}{f\sqrt{d\sec(e+fx)}}+\frac{a\int \sqrt{\cos(e+fx)}\,dx}{\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}}\\ &= -\frac{2b}{f\sqrt{d\sec(e+fx)}}+\frac{2aE\left(\frac{1}{2}(e+fx)\middle|2\right)}{f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}}\end{aligned}$$

Mathematica [A] time = 0.29, size = 54, normalized size = 0.93

$$\frac{2aE\left(\frac{1}{2}(e+fx)\middle|2\right)-2b\sqrt{\cos(e+fx)}}{f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Tan[e + f*x])/Sqrt[d*Sec[e + f*x]],x]
```

```
[Out] (-2*b*Sqrt[Cos[e + f*x]] + 2*a*EllipticE[(e + f*x)/2, 2])/(f*Sqrt[Cos[e + f
*x]]*Sqrt[d*Sec[e + f*x]])
```

fricas [F] time = 1.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{d\sec\left(fx+e\right)}\left(b\tan\left(fx+e\right)+a\right)}{d\sec\left(fx+e\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(d*sec(f*x + e))*(b*tan(f*x + e) + a)/(d*sec(f*x + e)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{b\tan\left(fx+e\right)+a}{\sqrt{d\sec\left(fx+e\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*tan(f*x + e) + a)/sqrt(d*sec(f*x + e)), x)
```

maple [C] time = 0.92, size = 916, normalized size = 15.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*tan(f*x+e))/(d*sec(f*x+e))^(1/2),x)
```

```
[Out] -1/2/f*(-1+cos(f*x+e))*(4*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x
+e)))^(1/2)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)^2*sin(f*x+e)*El
lipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a-4*I*(1/(1+cos(f*x+e)))^(1/2)*(cos
(f*x+e)/(1+cos(f*x+e)))^(1/2)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+
e)^2*sin(f*x+e)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a+8*I*(1/(1+cos(f
*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*(-cos(f*x+e)/(1+cos(f*x+e))
^2)^(1/2)*cos(f*x+e)*sin(f*x+e)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a
-8*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*(-cos(f*x+e
)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)*sin(f*x+e)*EllipticE(I*(-1+cos(f*x+e))
/sin(f*x+e),I)*a+4*I*a*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))
^(1/2)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin
(f*x+e),I)*sin(f*x+e)-4*I*a*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x
+e)))^(1/2)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*EllipticE(I*(-1+cos(f*x+e)
)/sin(f*x+e),I)*sin(f*x+e)-4*cos(f*x+e)^3*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1
/2)*a-4*cos(f*x+e)^2*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*b-4*co
s(f*x+e)*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*b+b*ln(-2*(2*(-cos
(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)^2-cos(f*x+e)^2-2*(-cos(f*x+e)/(1
```

```
+cos(f*x+e))^2)^(1/2)+2*cos(f*x+e)-1)/sin(f*x+e)^2)*cos(f*x+e)*sin(f*x+e)-b
*cos(f*x+e)*ln(-(2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)^2-cos(f*
x+e)^2-2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)+2*cos(f*x+e)-1)/sin(f*x+e)^2)
*sin(f*x+e)+4*cos(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*a)/(-cos(f*x+
e)/(1+cos(f*x+e))^2)^(1/2)/cos(f*x+e)/sin(f*x+e)^3/(d/cos(f*x+e))^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\tan\left(fx+e\right)+a}{\sqrt{d\sec\left(fx+e\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))^(1/2),x, algorithm="maxima")
[Out] integrate((b*tan(f*x + e) + a)/sqrt(d*sec(f*x + e)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{a+b\tan\left(e+f\,x\right)}{\sqrt{\frac{d}{\cos\left(e+f\,x\right)}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(e + f*x))/(d/cos(e + f*x))^(1/2),x)
[Out] int((a + b*tan(e + f*x))/(d/cos(e + f*x))^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\tan\left(e+fx\right)}{\sqrt{d\sec\left(e+fx\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))**(1/2),x)
[Out] Integral((a + b*tan(e + f*x))/sqrt(d*sec(e + f*x)), x)
```

3.583 $\int \frac{a+b\tan(e+fx)}{(d\sec(e+fx))^{3/2}}\,dx$

Optimal. Leaf size=94

$$\frac{2a\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx)}}{3d^2f}+\frac{2a\sin(e+fx)}{3df\sqrt{d\sec(e+fx)}}-\frac{2b}{3f(d\sec(e+fx))^{3/2}}$$

```
[Out] -2/3*b/f/(d*sec(f*x+e))^(3/2)+2/3*a*sin(f*x+e)/d/f/(d*sec(f*x+e))^(1/2)+2/3
*a*(cos(1/2*e+1/2*f*x)^2)^(1/2)/cos(1/2*e+1/2*f*x)*EllipticF(sin(1/2*e+1/2*
f*x),2^(1/2))*cos(f*x+e)^(1/2)*(d*sec(f*x+e))^(1/2)/d^2/f
```

Rubi [A] time = 0.07, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {3486, 3769, 3771, 2641}

$$\frac{2a\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx)}}{3d^2f}+\frac{2a\sin(e+fx)}{3df\sqrt{d\sec(e+fx)}}-\frac{2b}{3f(d\sec(e+fx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Tan[e + f*x])/(d*Sec[e + f*x])^(3/2),x]
```

```
[Out] (-2*b)/(3*f*(d*Sec[e + f*x])^(3/2)) + (2*a*Sqrt[Cos[e + f*x]]*EllipticF[(e
+ f*x)/2, 2]*Sqrt[d*Sec[e + f*x]])/(3*d^2*f) + (2*a*Sin[e + f*x])/(3*d*f*Sq
rt[d*Sec[e + f*x]])
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{a+b\tan(e+fx)}{(d\sec(e+fx))^{3/2}}\,dx = -\frac{2b}{3f(d\sec(e+fx))^{3/2}} + a\int \frac{1}{(d\sec(e+fx))^{3/2}}\,dx$$
$$= -\frac{2b}{3f(d\sec(e+fx))^{3/2}} + \frac{2a\sin(e+fx)}{3df\sqrt{d\sec(e+fx)}} + \frac{a\int \sqrt{d\sec(e+fx)}\,dx}{3d^2}$$
$$= -\frac{2b}{3f(d\sec(e+fx))^{3/2}} + \frac{2a\sin(e+fx)}{3df\sqrt{d\sec(e+fx)}} + \frac{\left(a\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}\right)\int \cdots}{3d^2}$$
$$= -\frac{2b}{3f(d\sec(e+fx))^{3/2}} + \frac{2a\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx)}}{3d^2f} + \frac{2a\sin\cdots}{3df\sqrt{d\cdots}}$$

Mathematica [A] time = 0.20, size = 69, normalized size = 0.73

$$-\frac{\sqrt{d\sec(e+fx)}\left(-a\sin(2(e+fx)) - 2a\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right) + b\cos(2(e+fx)) + b\right)}{3d^2f}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Tan[e + f*x])/(d*Sec[e + f*x])^(3/2),x]
[Out] -1/3*(Sqrt[d*Sec[e + f*x]]*(b + b*Cos[2*(e + f*x)] - 2*a*Sqrt[Cos[e + f*x]]
*EllipticF[(e + f*x)/2, 2] - a*Sin[2*(e + f*x)]))/(d^2*f)
```

fricas [F] time = 0.57, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{d\sec\left(fx+e\right)}\left(b\tan\left(fx+e\right)+a\right)}{d^2\sec\left(fx+e\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))^(3/2),x, algorithm="fricas")
[Out] integral(sqrt(d*sec(f*x + e))*(b*tan(f*x + e) + a)/(d^2*sec(f*x + e)^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\tan\left(fx+e\right)+a}{\left(d\sec\left(fx+e\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))^(3/2),x, algorithm="giac")
[Out] integrate((b*tan(f*x + e) + a)/(d*sec(f*x + e))^(3/2), x)
```

maple [C] time = 0.78, size = 172, normalized size = 1.83

$$\frac{\frac{2i\,\mathrm{EllipticF}\left(\frac{i(-1+\cos(fx+e))}{\sin(fx+e)},i\right)\sqrt{\frac{1}{1+\cos(fx+e)}}\sqrt{\frac{\cos(fx+e)}{1+\cos(fx+e)}}\cos(fx+e)a}{3} + \frac{2i\,\mathrm{EllipticF}\left(\frac{i(-1+\cos(fx+e))}{\sin(fx+e)},i\right)\sqrt{\frac{1}{1+\cos(fx+e)}}\sqrt{\frac{\cos(fx+e)}{1+\cos(fx+e)}}a}{3} - \frac{2(\mathrm{co}\cdots}{\cdots}}{f\cos\left(fx+e\right)^2\left(\frac{d}{\cos(fx+e)}\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*tan(f*x+e))/(d*sec(f*x+e))^(3/2),x)
```

```
[Out] 2/3/f*(I*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(1/(1+cos(f*x+e)))^(1/2)
*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*cos(f*x+e)*a+I*EllipticF(I*(-1+cos(f*x+e
))/sin(f*x+e),I)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)
*a-cos(f*x+e)^2*b+cos(f*x+e)*sin(f*x+e)*a)/cos(f*x+e)^2/(d/cos(f*x+e))^(3/2
)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b \tan\left(fx + e\right) + a}{\left(d \sec\left(fx + e\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((b*tan(f*x + e) + a)/(d*sec(f*x + e))^(3/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + b \tan\left(e + f\,x\right)}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{3/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(e + f*x))/(d/cos(e + f*x))^(3/2),x)
```

```
[Out] int((a + b*tan(e + f*x))/(d/cos(e + f*x))^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \tan\left(e + fx\right)}{\left(d \sec\left(e + fx\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))**(3/2),x)
```

```
[Out] Integral((a + b*tan(e + f*x))/(d*sec(e + f*x))**(3/2), x)
```

3.584 $\int \frac{a+b\tan(e+fx)}{(d\sec(e+fx))^{5/2}}\,dx$

Optimal. Leaf size=94

$$\frac{6aE\left(\frac{1}{2}(e+fx)\middle|2\right)}{5d^2f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}}+\frac{2a\sin(e+fx)}{5df(d\sec(e+fx))^{3/2}}-\frac{2b}{5f(d\sec(e+fx))^{5/2}}$$

```
[Out] -2/5*b/f/(d*sec(f*x+e))^(5/2)+2/5*a*sin(f*x+e)/d/f/(d*sec(f*x+e))^(3/2)+6/5
*a*(cos(1/2*e+1/2*f*x)^2)^(1/2)/cos(1/2*e+1/2*f*x)*EllipticE(sin(1/2*e+1/2*
f*x),2^(1/2))/d^2/f/cos(f*x+e)^(1/2)/(d*sec(f*x+e))^(1/2)
```

Rubi [A] time = 0.07, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {3486, 3769, 3771, 2639}

$$\frac{6aE\left(\frac{1}{2}(e+fx)\middle|2\right)}{5d^2f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}}+\frac{2a\sin(e+fx)}{5df(d\sec(e+fx))^{3/2}}-\frac{2b}{5f(d\sec(e+fx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Tan[e + f*x])/(d*Sec[e + f*x])^(5/2),x]
```

```
[Out] (-2*b)/(5*f*(d*Sec[e + f*x])^(5/2)) + (6*a*EllipticE[(e + f*x)/2, 2])/(5*d^
2*f*Sqrt[Cos[e + f*x]]*Sqrt[d*Sec[e + f*x]]) + (2*a*Sin[e + f*x])/(5*d*f*(d
*Sec[e + f*x])^(3/2))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{a+b\tan(e+fx)}{(d\sec(e+fx))^{5/2}}\,dx = -\frac{2b}{5f(d\sec(e+fx))^{5/2}} + a\int \frac{1}{(d\sec(e+fx))^{5/2}}\,dx$$
$$= -\frac{2b}{5f(d\sec(e+fx))^{5/2}} + \frac{2a\sin(e+fx)}{5df(d\sec(e+fx))^{3/2}} + \frac{(3a)\int \frac{1}{\sqrt{d\sec(e+fx)}}\,dx}{5d^2}$$
$$= -\frac{2b}{5f(d\sec(e+fx))^{5/2}} + \frac{2a\sin(e+fx)}{5df(d\sec(e+fx))^{3/2}} + \frac{(3a)\int \sqrt{\cos(e+fx)}\,dx}{5d^2\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}}$$
$$= -\frac{2b}{5f(d\sec(e+fx))^{5/2}} + \frac{6aE\left(\frac{1}{2}(e+fx)\middle|2\right)}{5d^2f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}} + \frac{2a\sin(e+fx)}{5df(d\sec(e+fx))^{3/2}}$$

Mathematica [A] time = 0.60, size = 74, normalized size = 0.79

$$\frac{2\sqrt{d\sec(e+fx)}\left(\cos^2(e+fx)(a\sin(e+fx)-b\cos(e+fx))+3a\sqrt{\cos(e+fx)}\,E\left(\frac{1}{2}(e+fx)\middle|2\right)\right)}{5d^3f}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Tan[e + f*x])/(d*Sec[e + f*x])^(5/2),x]
```

```
[Out] (2*Sqrt[d*Sec[e + f*x]]*(3*a*Sqrt[Cos[e + f*x]]*EllipticE[(e + f*x)/2, 2] +
 Cos[e + f*x]^2*(-(b*Cos[e + f*x]) + a*Sin[e + f*x])))/(5*d^3*f)
```

fricas [F] time = 0.98, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{d\sec\left(fx+e\right)}\left(b\tan\left(fx+e\right)+a\right)}{d^3\sec\left(fx+e\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))^(5/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(d*sec(f*x + e))*(b*tan(f*x + e) + a)/(d^3*sec(f*x + e)^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\tan\left(fx+e\right)+a}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*tan(f*x + e) + a)/(d*sec(f*x + e))^(5/2), x)
```

maple [C] time = 0.81, size = 345, normalized size = 3.67

$$-\frac{2\left(-3i\cos\left(fx+e\right)\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\sqrt{\frac{\cos\left(fx+e\right)}{1+\cos\left(fx+e\right)}}\ \text{EllipticF}\left(\frac{i\left(-1+\cos\left(fx+e\right)\right)}{\sin\left(fx+e\right)},i\right)a\sin\left(fx+e\right)+3i\cos\left(fx+e\right)\sqrt{\frac{}{1+}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*tan(f*x+e))/(d*sec(f*x+e))^(5/2),x)
```

```
[Out] -2/5/f*(-3*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*cos
(f*x+e)*sin(f*x+e)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a+3*I*(1/(1+co
s(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*cos(f*x+e)*sin(f*x+e)*El
lipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a-3*I*(1/(1+cos(f*x+e)))^(1/2)*(cos
(f*x+e)/(1+cos(f*x+e)))^(1/2)*sin(f*x+e)*EllipticF(I*(-1+cos(f*x+e))/sin(f*
x+e),I)*a+3*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*si
n(f*x+e)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a+a*cos(f*x+e)^4+cos(f*x
+e)^3*sin(f*x+e)*b+2*cos(f*x+e)^2*a-3*a*cos(f*x+e))/cos(f*x+e)^3/sin(f*x+e)
/(d/cos(f*x+e))^(5/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b \tan\left(fx + e\right) + a}{\left(d \sec\left(fx + e\right)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((b*tan(f*x + e) + a)/(d*sec(f*x + e))^(5/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + b \tan\left(e + f\,x\right)}{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{5/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(e + f*x))/(d/cos(e + f*x))^(5/2),x)
```

```
[Out] int((a + b*tan(e + f*x))/(d/cos(e + f*x))^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \tan\left(e + fx\right)}{\left(d \sec\left(e + fx\right)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))**(5/2),x)
```

```
[Out] Integral((a + b*tan(e + f*x))/(d*sec(e + f*x))**(5/2), x)
```

3.585 $\int \frac{a+b\tan(e+fx)}{(d\sec(e+fx))^{7/2}}\,dx$

Optimal. Leaf size=123

$$\frac{10a\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx)}}{21d^4f}+\frac{10a\sin(e+fx)}{21d^3f\sqrt{d\sec(e+fx)}}+\frac{2a\sin(e+fx)}{7df(d\sec(e+fx))^{5/2}}-\frac{2b}{7f(d\sec(e+f$$

```
[Out] -2/7*b/f/(d*sec(f*x+e))^(7/2)+2/7*a*sin(f*x+e)/d/f/(d*sec(f*x+e))^(5/2)+10/
21*a*sin(f*x+e)/d^3/f/(d*sec(f*x+e))^(1/2)+10/21*a*(cos(1/2*e+1/2*f*x)^2)^(
1/2)/cos(1/2*e+1/2*f*x)*EllipticF(sin(1/2*e+1/2*f*x),2^(1/2))*cos(f*x+e)^(1
/2)*(d*sec(f*x+e))^(1/2)/d^4/f
```

Rubi [A] time = 0.09, antiderivative size = 123, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {3486, 3769, 3771, 2641}

$$\frac{10a\sin(e+fx)}{21d^3f\sqrt{d\sec(e+fx)}}+\frac{10a\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx)}}{21d^4f}+\frac{2a\sin(e+fx)}{7df(d\sec(e+fx))^{5/2}}-\frac{2b}{7f(d\sec(e+f$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Tan[e + f*x])/(d*Sec[e + f*x])^(7/2),x]
```

```
[Out] (-2*b)/(7*f*(d*Sec[e + f*x])^(7/2)) + (10*a*Sqrt[Cos[e + f*x]]*EllipticF[(e
 + f*x)/2, 2]*Sqrt[d*Sec[e + f*x]])/(21*d^4*f) + (2*a*Sin[e + f*x])/(7*d*f*
(d*Sec[e + f*x])^(5/2)) + (10*a*Sin[e + f*x])/(21*d^3*f*Sqrt[d*Sec[e + f*x]
])
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{a+b\tan(e+fx)}{(d\sec(e+fx))^{7/2}}\,dx = -\frac{2b}{7f(d\sec(e+fx))^{7/2}} + a\int \frac{1}{(d\sec(e+fx))^{7/2}}\,dx$$

$$= -\frac{2b}{7f(d\sec(e+fx))^{7/2}} + \frac{2a\sin(e+fx)}{7df(d\sec(e+fx))^{5/2}} + \frac{(5a)\int \frac{1}{(d\sec(e+fx))^{3/2}}\,dx}{7d^2}$$

$$= -\frac{2b}{7f(d\sec(e+fx))^{7/2}} + \frac{2a\sin(e+fx)}{7df(d\sec(e+fx))^{5/2}} + \frac{10a\sin(e+fx)}{21d^3f\sqrt{d\sec(e+fx)}} + \frac{(5a)\int \sqrt{d}\cdots}{\cdots}$$

$$= -\frac{2b}{7f(d\sec(e+fx))^{7/2}} + \frac{2a\sin(e+fx)}{7df(d\sec(e+fx))^{5/2}} + \frac{10a\sin(e+fx)}{21d^3f\sqrt{d\sec(e+fx)}} + \frac{\left(5a\sqrt{\cos\cdots}\right.}{\cdots}$$

$$= -\frac{2b}{7f(d\sec(e+fx))^{7/2}} + \frac{10a\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx)}}{21d^4f} + \frac{2a\cdots}{7df(d\cdots}$$

Mathematica [A] time = 0.35, size = 94, normalized size = 0.76

$$\frac{\sqrt{d\sec(e+fx)}\left(26a\sin(2(e+fx)) + 3a\sin(4(e+fx)) + 40a\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right) - 12b\cos(2(e+f\cdots\right.}{84d^4f}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Tan[e + f*x])/(d*Sec[e + f*x])^(7/2),x]
```

```
[Out] (Sqrt[d*Sec[e + f*x]]*(-9*b - 12*b*Cos[2*(e + f*x)] - 3*b*Cos[4*(e + f*x)]
+ 40*a*Sqrt[Cos[e + f*x]]*EllipticF[(e + f*x)/2, 2] + 26*a*Sin[2*(e + f*x)]
 + 3*a*Sin[4*(e + f*x)]))/(84*d^4*f)
```

fricas [F] time = 2.47, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{d\sec\left(fx+e\right)}\left(b\tan\left(fx+e\right)+a\right)}{d^4\sec\left(fx+e\right)^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))^(7/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(d*sec(f*x + e))*(b*tan(f*x + e) + a)/(d^4*sec(f*x + e)^4), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b\tan\left(fx+e\right)+a}{\left(d\sec\left(fx+e\right)\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))^(7/2),x, algorithm="giac")
```

```
[Out] integrate((b*tan(f*x + e) + a)/(d*sec(f*x + e))^(7/2), x)
```

maple [C] time = 0.82, size = 190, normalized size = 1.54

$$\frac{\frac{10i\,\mathrm{EllipticF}\left(\frac{i\left(-1+\cos\left(fx+e\right)\right)}{\sin\left(fx+e\right)}, i\right)\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\sqrt{\frac{\cos\left(fx+e\right)}{1+\cos\left(fx+e\right)}}\cos\left(fx+e\right)a}{21} + \frac{10i\,\mathrm{EllipticF}\left(\frac{i\left(-1+\cos\left(fx+e\right)\right)}{\sin\left(fx+e\right)}, i\right)\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\sqrt{\frac{\cos\left(fx+e\right)}{1+\cos\left(fx+e\right)}}\,a}{21} - \frac{2b\cdots}{\cdots}}{f\cos\left(fx+e\right)^4\left(\frac{d}{\cos\left(fx+e\right)}\right)^{\frac{7}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*tan(f*x+e))/(d*sec(f*x+e))^(7/2),x)
```

```
[Out] 2/21/f*(5*I*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(1/(1+cos(f*x+e)))^(1
/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*cos(f*x+e)*a+5*I*EllipticF(I*(-1+cos(
f*x+e))/sin(f*x+e),I)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^
(1/2)*a-3*b*cos(f*x+e)^4+3*cos(f*x+e)^3*sin(f*x+e)*a+5*cos(f*x+e)*sin(f*x+e
)*a)/cos(f*x+e)^4/(d/cos(f*x+e))^(7/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{b \tan\left(fx + e\right) + a}{\left(d \sec\left(fx + e\right)\right)^{\frac{7}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))^(7/2),x, algorithm="maxima")
```

```
[Out] integrate((b*tan(f*x + e) + a)/(d*sec(f*x + e))^(7/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + b \tan\left(e + f\,x\right)}{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{7/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(e + f*x))/(d/cos(e + f*x))^(7/2),x)
```

```
[Out] int((a + b*tan(e + f*x))/(d/cos(e + f*x))^(7/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \tan\left(e + fx\right)}{\left(d \sec\left(e + fx\right)\right)^{\frac{7}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))**(7/2),x)
```

```
[Out] Integral((a + b*tan(e + f*x))/(d*sec(e + f*x))**(7/2), x)
```

3.586 $\int (d\sec(e+fx))^{5/2}(a+b\tan(e+fx))^2\,dx$

Optimal. Leaf size=143

$$\frac{2d^2\left(7a^2-2b^2\right)\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx)}}{21f}+\frac{2d\left(7a^2-2b^2\right)\sin(e+fx)(d\sec(e+fx))^{3/2}}{21f}+$$

```
[Out] 18/35*a*b*(d*sec(f*x+e))^(5/2)/f+2/21*(7*a^2-2*b^2)*d*(d*sec(f*x+e))^(3/2)*
sin(f*x+e)/f+2/21*(7*a^2-2*b^2)*d^2*(cos(1/2*e+1/2*f*x)^2)^(1/2)/cos(1/2*e+
1/2*f*x)*EllipticF(sin(1/2*e+1/2*f*x),2^(1/2))*cos(f*x+e)^(1/2)*(d*sec(f*x+
e))^(1/2)/f+2/7*b*(d*sec(f*x+e))^(5/2)*(a+b*tan(f*x+e))/f
```

Rubi [A] time = 0.16, antiderivative size = 143, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {3508, 3486, 3768, 3771, 2641}

$$\frac{2d^2\left(7a^2-2b^2\right)\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx)}}{21f}+\frac{2d\left(7a^2-2b^2\right)\sin(e+fx)(d\sec(e+fx))^{3/2}}{21f}+$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(5/2)*(a + b*Tan[e + f*x])^2,x]
```

```
[Out] (2*(7*a^2 - 2*b^2)*d^2*Sqrt[Cos[e + f*x]]*EllipticF[(e + f*x)/2, 2]*Sqrt[d*
Sec[e + f*x]])/(21*f) + (18*a*b*(d*Sec[e + f*x])^(5/2))/(35*f) + (2*(7*a^2
- 2*b^2)*d*(d*Sec[e + f*x])^(3/2)*Sin[e + f*x])/(21*f) + (2*b*(d*Sec[e + f*
x])^(5/2)*(a + b*Tan[e + f*x]))/(7*f)
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3508

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^2, x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(
m + 1)), x] + Dist[1/(m + 1), Int[(d*Sec[e + f*x])^m*(a^2*(m + 1) - b^2 + a
*b*(m + 2)*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, m}, x] && NeQ[a^2
 + b^2, 0] && NeQ[m, -1]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
```

```
EqQ[n^2, 1/4]
```

Rubi steps

$$\int (d\sec(e+fx))^{5/2}(a+b\tan(e+fx))^2\,dx = \frac{2b(d\sec(e+fx))^{5/2}(a+b\tan(e+fx))}{7f} + \frac{2}{7}\int (d\sec(e+fx))^{5/2}\Big(\frac{7a}{2}$$

$$= \frac{18ab(d\sec(e+fx))^{5/2}}{35f} + \frac{2b(d\sec(e+fx))^{5/2}(a+b\tan(e+fx))}{7f} +$$

$$= \frac{18ab(d\sec(e+fx))^{5/2}}{35f} + \frac{2\left(7a^2-2b^2\right)d(d\sec(e+fx))^{3/2}\sin(e+f}{21f}$$

$$= \frac{18ab(d\sec(e+fx))^{5/2}}{35f} + \frac{2\left(7a^2-2b^2\right)d(d\sec(e+fx))^{3/2}\sin(e+f}{21f}$$

$$= \frac{2\left(7a^2-2b^2\right)d^2\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx)}}{21f} + \frac{18}{}$$

Mathematica [A] time = 0.78, size = 127, normalized size = 0.89

$$\frac{2d^2\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^2\left(\frac{5}{2}\left(7a^2-2b^2\right)\sin(2(e+fx))+5\left(7a^2-2b^2\right)\cos^{\frac{5}{2}}(e+fx)F\left(\frac{1}{2}(e+fx)\middle|2\right.}{105f(a\cos(e+fx)+b\sin(e+fx))^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(5/2)*(a + b*Tan[e + f*x])^2,x]
```

```
[Out] (2*d^2*Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x])^2*(5*(7*a^2 - 2*b^2)*Cos[e
 + f*x]^(5/2)*EllipticF[(e + f*x)/2, 2] + (5*(7*a^2 - 2*b^2)*Sin[2*(e + f*x
)])/2 + 3*b*(14*a + 5*b*Tan[e + f*x])))/(105*f*(a*Cos[e + f*x] + b*Sin[e +
f*x])^2)
```

fricas [F] time = 1.05, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(b^2d^2\sec\left(fx+e\right)^2\tan\left(fx+e\right)^2+2\,abd^2\sec\left(fx+e\right)^2\tan\left(fx+e\right)+a^2d^2\sec\left(fx+e\right)^2\right)\sqrt{d\sec\left(fx-\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/2)*(a+b*tan(f*x+e))^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*d^2*sec(f*x + e)^2*tan(f*x + e)^2 + 2*a*b*d^2*sec(f*x + e)^2*
tan(f*x + e) + a^2*d^2*sec(f*x + e)^2)*sqrt(d*sec(f*x + e)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{5}{2}}\left(b\tan\left(fx+e\right)+a\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/2)*(a+b*tan(f*x+e))^2,x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(5/2)*(b*tan(f*x + e) + a)^2, x)
```

maple [C] time = 0.95, size = 382, normalized size = 2.67

$$\frac{2\left(1+\cos\left(fx+e\right)\right)^2\left(-1+\cos\left(fx+e\right)\right)^2\left(35i\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\sqrt{\frac{\cos\left(fx+e\right)}{1+\cos\left(fx+e\right)}}\left(\cos^4\left(fx+e\right)\right)\text{EllipticF}\left(\frac{i\left(-1+\cos\left(fx+e\right)\right)}{\sin\left(fx+e\right)}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(5/2)*(a+b*tan(f*x+e))^2,x)
```

```
[Out] 2/105/f*(1+cos(f*x+e))^2*(-1+cos(f*x+e))^2*(35*I*(1/(1+cos(f*x+e)))^(1/2)*(
cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*cos(f*x+e)^4*EllipticF(I*(-1+cos(f*x+e))/s
in(f*x+e),I)*a^2-10*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^
(1/2)*cos(f*x+e)^4*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*b^2+35*I*(1/(1
+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*cos(f*x+e)^3*Elliptic
F(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a^2-10*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*
x+e)/(1+cos(f*x+e)))^(1/2)*cos(f*x+e)^3*EllipticF(I*(-1+cos(f*x+e))/sin(f*x
+e),I)*b^2+35*cos(f*x+e)^2*sin(f*x+e)*a^2-10*cos(f*x+e)^2*sin(f*x+e)*b^2+42
*cos(f*x+e)*a*b+15*sin(f*x+e)*b^2)*(d/cos(f*x+e))^(5/2)/sin(f*x+e)^4/cos(f*
x+e)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{5}{2}}\left(b\tan\left(fx+e\right)+a\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/2)*(a+b*tan(f*x+e))^2,x, algorithm="maxima")
```

```
[Out] integrate((d*sec(f*x + e))^(5/2)*(b*tan(f*x + e) + a)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{5/2}\,{\left(a+b\,\tan\left(e+f\,x\right)\right)}^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(5/2)*(a + b*tan(e + f*x))^2,x)
```

```
[Out] int((d/cos(e + f*x))^(5/2)*(a + b*tan(e + f*x))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(5/2)*(a+b*tan(f*x+e))**2,x)
```

```
[Out] Timed out
```

3.587 $\int (d\sec(e+fx))^{3/2}(a+b\tan(e+fx))^2\,dx$

Optimal. Leaf size=143

$$-\frac{2d^2\left(5a^2-2b^2\right)E\left(\frac{1}{2}(e+fx)\middle|2\right)}{5f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}}+\frac{2d\left(5a^2-2b^2\right)\sin(e+fx)\sqrt{d\sec(e+fx)}}{5f}+\frac{14ab(d\sec(e+fx))^{3/2}}{15f}+\frac{2b(d\sec(}{}$$

```
[Out] 14/15*a*b*(d*sec(f*x+e))^(3/2)/f-2/5*(5*a^2-2*b^2)*d^2*(cos(1/2*e+1/2*f*x)^
2)^(1/2)/cos(1/2*e+1/2*f*x)*EllipticE(sin(1/2*e+1/2*f*x),2^(1/2))/f/cos(f*x
+e)^(1/2)/(d*sec(f*x+e))^(1/2)+2/5*(5*a^2-2*b^2)*d*sin(f*x+e)*(d*sec(f*x+e)
)^(1/2)/f+2/5*b*(d*sec(f*x+e))^(3/2)*(a+b*tan(f*x+e))/f
```

Rubi [A] time = 0.16, antiderivative size = 143, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3508, 3486, 3768, 3771, 2639}

$$-\frac{2d^2\left(5a^2-2b^2\right)E\left(\frac{1}{2}(e+fx)\middle|2\right)}{5f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}}+\frac{2d\left(5a^2-2b^2\right)\sin(e+fx)\sqrt{d\sec(e+fx)}}{5f}+\frac{14ab(d\sec(e+fx))^{3/2}}{15f}+\frac{2b(d\sec(}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(3/2)*(a + b*Tan[e + f*x])^2,x]
```

```
[Out] (-2*(5*a^2 - 2*b^2)*d^2*EllipticE[(e + f*x)/2, 2])/(5*f*Sqrt[Cos[e + f*x]]*
Sqrt[d*Sec[e + f*x]]) + (14*a*b*(d*Sec[e + f*x])^(3/2))/(15*f) + (2*(5*a^2
- 2*b^2)*d*Sqrt[d*Sec[e + f*x]]*Sin[e + f*x])/(5*f) + (2*b*(d*Sec[e + f*x])
^(3/2)*(a + b*Tan[e + f*x]))/(5*f)
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3508

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^2, x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(
m + 1)), x] + Dist[1/(m + 1), Int[(d*Sec[e + f*x])^m*(a^2*(m + 1) - b^2 + a
*b*(m + 2)*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, m}, x] && NeQ[a^2
 + b^2, 0] && NeQ[m, -1]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
```

```
EqQ[n^2, 1/4]
```

Rubi steps

$$\int (d\sec(e+fx))^{3/2}(a+b\tan(e+fx))^2\,dx = \frac{2b(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))}{5f} + \frac{2}{5}\int (d\sec(e+fx))^{3/2}$$
$$= \frac{14ab(d\sec(e+fx))^{3/2}}{15f} + \frac{2b(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))}{5f}$$
$$= \frac{14ab(d\sec(e+fx))^{3/2}}{15f} + \frac{2\left(5a^2-2b^2\right)d\sqrt{d\sec(e+fx)}\,\sin(e+}{5f}$$
$$= \frac{14ab(d\sec(e+fx))^{3/2}}{15f} + \frac{2\left(5a^2-2b^2\right)d\sqrt{d\sec(e+fx)}\,\sin(e+}{5f}$$
$$= -\frac{2\left(5a^2-2b^2\right)d^2E\left(\frac{1}{2}(e+fx)\middle|2\right)}{5f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}} + \frac{14ab(d\sec(e+fx))^{3/2}}{15f} + \frac{2(}{}$$

Mathematica [A] time = 0.65, size = 126, normalized size = 0.88

$$-\frac{2d^2(a+b\tan(e+fx))^2\left(\left(3b^2-\frac{15a^2}{2}\right)\sin(2(e+fx))+3\left(5a^2-2b^2\right)\cos^{\frac{3}{2}}(e+fx)E\left(\frac{1}{2}(e+fx)\middle|2\right)-b(10a+\right.}{15f\sqrt{d\sec(e+fx)}\,(a\cos(e+fx)+b\sin(e+fx))^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(3/2)*(a + b*Tan[e + f*x])^2,x]
```

```
[Out] (-2*d^2*(a + b*Tan[e + f*x])^2*(3*(5*a^2 - 2*b^2)*Cos[e + f*x]^(3/2)*Ellipt
icE[(e + f*x)/2, 2] + ((-15*a^2)/2 + 3*b^2)*Sin[2*(e + f*x)] - b*(10*a + 3*
b*Tan[e + f*x])))/(15*f*Sqrt[d*Sec[e + f*x]]*(a*Cos[e + f*x] + b*Sin[e + f*
x])^2)
```

fricas [F] time = 0.60, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(b^2d\sec\left(fx+e\right)\tan\left(fx+e\right)^2+2\,abd\sec\left(fx+e\right)\tan\left(fx+e\right)+a^2d\sec\left(fx+e\right)\right)\sqrt{d\sec\left(fx+e\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(3/2)*(a+b*tan(f*x+e))^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*d*sec(f*x + e)*tan(f*x + e)^2 + 2*a*b*d*sec(f*x + e)*tan(f*x
+ e) + a^2*d*sec(f*x + e))*sqrt(d*sec(f*x + e)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{3}{2}}\left(b\tan\left(fx+e\right)+a\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(3/2)*(a+b*tan(f*x+e))^2,x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(3/2)*(b*tan(f*x + e) + a)^2, x)
```

maple [C] time = 0.91, size = 712, normalized size = 4.98

$$-\frac{2\left(1+\cos\left(fx+e\right)\right)^{2}\left(-1+\cos\left(fx+e\right)\right)^{2}\left(15i\left(\cos^{3}\left(fx+e\right)\right)\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\sqrt{\frac{\cos\left(fx+e\right)}{1+\cos\left(fx+e\right)}}\ \mathrm{EllipticF}\left(\frac{i\left(-1+\cos\left(f\right.\right.}{\sin\left(fx+e\right.}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(3/2)*(a+b*tan(f*x+e))^2,x)
```

```
[Out] -2/15/f*(1+cos(f*x+e))^2*(-1+cos(f*x+e))^2*(15*I*cos(f*x+e)^3*(1/(1+cos(f*x
+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/s
in(f*x+e),I)*sin(f*x+e)*a^2-6*I*cos(f*x+e)^3*(1/(1+cos(f*x+e)))^(1/2)*(cos(
f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*sin(
f*x+e)*b^2-15*I*cos(f*x+e)^3*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*
x+e)))^(1/2)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*sin(f*x+e)*a^2+6*I*c
os(f*x+e)^3*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*Elli
pticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*sin(f*x+e)*b^2+15*I*cos(f*x+e)^2*(1/(
1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(
f*x+e))/sin(f*x+e),I)*sin(f*x+e)*a^2-6*I*cos(f*x+e)^2*(1/(1+cos(f*x+e)))^(1
/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e
),I)*sin(f*x+e)*b^2-15*I*cos(f*x+e)^2*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/
(1+cos(f*x+e)))^(1/2)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*sin(f*x+e)*
a^2+6*I*cos(f*x+e)^2*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(
1/2)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*sin(f*x+e)*b^2+15*cos(f*x+e)
^3*a^2-6*cos(f*x+e)^3*b^2-15*a^2*cos(f*x+e)^2+9*b^2*cos(f*x+e)^2-10*a*cos(f
*x+e)*b*sin(f*x+e)-3*b^2)*(d/cos(f*x+e))^(3/2)/sin(f*x+e)^5/cos(f*x+e)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(d\sec\left(fx+e\right)\right)^{\frac{3}{2}}\left(b\tan\left(fx+e\right)+a\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(3/2)*(a+b*tan(f*x+e))^2,x, algorithm="maxima")
```

```
[Out] integrate((d*sec(f*x + e))^(3/2)*(b*tan(f*x + e) + a)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{3/2}\left(a+b\tan\left(e+f\,x\right)\right)^{2}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(3/2)*(a + b*tan(e + f*x))^2,x)
```

```
[Out] int((d/cos(e + f*x))^(3/2)*(a + b*tan(e + f*x))^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(d\sec\left(e+fx\right)\right)^{\frac{3}{2}}\left(a+b\tan\left(e+fx\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(3/2)*(a+b*tan(f*x+e))**2,x)
```

```
[Out] Integral((d*sec(e + f*x))**(3/2)*(a + b*tan(e + f*x))**2, x)
```

3.588 $\int \sqrt{d \sec(e+fx)}\,(a+b\tan(e+fx))^2\,dx$

Optimal. Leaf size=103

$$\frac{2\left(3a^2-2b^2\right)\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx)}}{3f}+\frac{10ab\sqrt{d\sec(e+fx)}}{3f}+\frac{2b\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))}{3f}$$

```
[Out] 10/3*a*b*(d*sec(f*x+e))^(1/2)/f+2/3*(3*a^2-2*b^2)*(cos(1/2*e+1/2*f*x)^2)^(1
/2)/cos(1/2*e+1/2*f*x)*EllipticF(sin(1/2*e+1/2*f*x),2^(1/2))*cos(f*x+e)^(1/
2)*(d*sec(f*x+e))^(1/2)/f+2/3*b*(d*sec(f*x+e))^(1/2)*(a+b*tan(f*x+e))/f
```

Rubi [A] time = 0.12, antiderivative size = 103, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {3508, 3486, 3771, 2641}

$$\frac{2\left(3a^2-2b^2\right)\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx)}}{3f}+\frac{10ab\sqrt{d\sec(e+fx)}}{3f}+\frac{2b\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))}{3f}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x])^2,x]
```

```
[Out] (10*a*b*Sqrt[d*Sec[e + f*x]])/(3*f) + (2*(3*a^2 - 2*b^2)*Sqrt[Cos[e + f*x]]
*EllipticF[(e + f*x)/2, 2]*Sqrt[d*Sec[e + f*x]])/(3*f) + (2*b*Sqrt[d*Sec[e
+ f*x]]*(a + b*Tan[e + f*x]))/(3*f)
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3508

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^2, x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(
m + 1)), x] + Dist[1/(m + 1), Int[(d*Sec[e + f*x])^m*(a^2*(m + 1) - b^2 + a
*b*(m + 2)*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, m}, x] && NeQ[a^2
 + b^2, 0] && NeQ[m, -1]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^2\,dx = \frac{2b\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))}{3f}+\frac{2}{3}\int \sqrt{d\sec(e+fx)}\left(\frac{3a^2}{2}-\right.$$
$$=\frac{10ab\sqrt{d\sec(e+fx)}}{3f}+\frac{2b\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))}{3f}+\frac{1}{3}\left(3a\right.$$
$$=\frac{10ab\sqrt{d\sec(e+fx)}}{3f}+\frac{2b\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))}{3f}+\frac{1}{3}\left(\left(3\right.\right.$$
$$=\frac{10ab\sqrt{d\sec(e+fx)}}{3f}+\frac{2\left(3a^2-2b^2\right)\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{}}{3f}$$

Mathematica [A] time = 0.63, size = 87, normalized size = 0.84

$$\frac{2\sec^2(e+fx)\sqrt{d\sec(e+fx)}\left(\left(3a^2-2b^2\right)\cos^{\frac{5}{2}}(e+fx)F\left(\frac{1}{2}(e+fx)\middle|2\right)+b\cos(e+fx)(6a\cos(e+fx)+b\sin(e\right.}{3f}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x])^2,x]
```

```
[Out] (2*Sec[e + f*x]^2*Sqrt[d*Sec[e + f*x]]*((3*a^2 - 2*b^2)*Cos[e + f*x]^(5/2)*
EllipticF[(e + f*x)/2, 2] + b*Cos[e + f*x]*(6*a*Cos[e + f*x] + b*Sin[e + f*
x])))/(3*f)
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\left(b^2\tan\left(fx+e\right)^2+2\,ab\tan\left(fx+e\right)+a^2\right)\sqrt{d\sec\left(fx+e\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/2)*(a+b*tan(f*x+e))^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*tan(f*x + e)^2 + 2*a*b*tan(f*x + e) + a^2)*sqrt(d*sec(f*x + e
)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{d\sec\left(fx+e\right)}\left(b\tan\left(fx+e\right)+a\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/2)*(a+b*tan(f*x+e))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(d*sec(f*x + e))*(b*tan(f*x + e) + a)^2, x)
```

maple [C] time = 0.90, size = 339, normalized size = 3.29

$$\frac{2\sqrt{\frac{d}{\cos\left(fx+e\right)}}\left(-1+\cos\left(fx+e\right)\right)^2\left(3i\left(\cos^2\left(fx+e\right)\right)\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\sqrt{\frac{\cos\left(fx+e\right)}{1+\cos\left(fx+e\right)}}\,\mathrm{EllipticF}\left(\frac{i\left(-1+\cos\left(fx+e\right)\right)}{\sin\left(fx+e\right)},i\right)a^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(1/2)*(a+b*tan(f*x+e))^2,x)
```

```
[Out] 2/3/f*(d/cos(f*x+e))^(1/2)*(-1+cos(f*x+e))^2*(3*I*cos(f*x+e)^2*(1/(1+cos(f*
x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/
sin(f*x+e),I)*a^2-2*I*cos(f*x+e)^2*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+
cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*b^2+3*I*cos(f*
x+e)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I
*(-1+cos(f*x+e))/sin(f*x+e),I)*a^2-2*I*cos(f*x+e)*(1/(1+cos(f*x+e)))^(1/2)*
(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)
*b^2+6*cos(f*x+e)*a*b+sin(f*x+e)*b^2)*(1+cos(f*x+e))^2/cos(f*x+e)/sin(f*x+e
)^4
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{d \sec\left(fx+e\right)}\left(b \tan\left(fx+e\right)+a\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/2)*(a+b*tan(f*x+e))^2,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(d*sec(f*x + e))*(b*tan(f*x + e) + a)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \sqrt{\frac{d}{\cos\left(e+f\,x\right)}}\,\left(a+b\tan\left(e+f\,x\right)\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(1/2)*(a + b*tan(e + f*x))^2,x)
```

```
[Out] int((d/cos(e + f*x))^(1/2)*(a + b*tan(e + f*x))^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{d \sec\left(e+fx\right)}\,\left(a+b\tan\left(e+fx\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(1/2)*(a+b*tan(f*x+e))**2,x)
```

```
[Out] Integral(sqrt(d*sec(e + f*x))*(a + b*tan(e + f*x))**2, x)
```

3.589 $\int \frac{(a+b\tan(e+fx))^2}{\sqrt{d\sec(e+fx)}}\,dx$

Optimal. Leaf size=95

$$\frac{2\left(a^2-2b^2\right)E\left(\frac{1}{2}(e+fx)\middle|2\right)}{f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}}-\frac{6ab}{f\sqrt{d\sec(e+fx)}}+\frac{2b(a+b\tan(e+fx))}{f\sqrt{d\sec(e+fx)}}$$

```
[Out] -6*a*b/f/(d*sec(f*x+e))^(1/2)+2*(a^2-2*b^2)*(cos(1/2*e+1/2*f*x)^2)^(1/2)/co
s(1/2*e+1/2*f*x)*EllipticE(sin(1/2*e+1/2*f*x),2^(1/2))/f/cos(f*x+e)^(1/2)/(
d*sec(f*x+e))^(1/2)+2*b*(a+b*tan(f*x+e))/f/(d*sec(f*x+e))^(1/2)
```

Rubi [A] time = 0.13, antiderivative size = 95, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {3508, 3486, 3771, 2639}

$$\frac{2\left(a^2-2b^2\right)E\left(\frac{1}{2}(e+fx)\middle|2\right)}{f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}}-\frac{6ab}{f\sqrt{d\sec(e+fx)}}+\frac{2b(a+b\tan(e+fx))}{f\sqrt{d\sec(e+fx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Tan[e + f*x])^2/Sqrt[d*Sec[e + f*x]],x]
```

```
[Out] (-6*a*b)/(f*Sqrt[d*Sec[e + f*x]]) + (2*(a^2 - 2*b^2)*EllipticE[(e + f*x)/2,
 2])/(f*Sqrt[Cos[e + f*x]]*Sqrt[d*Sec[e + f*x]]) + (2*b*(a + b*Tan[e + f*x]
))/(f*Sqrt[d*Sec[e + f*x]])
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3508

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^2, x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(
m + 1)), x] + Dist[1/(m + 1), Int[(d*Sec[e + f*x])^m*(a^2*(m + 1) - b^2 + a
*b*(m + 2)*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, m}, x] && NeQ[a^2
 + b^2, 0] && NeQ[m, -1]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+b\tan(e+fx))^2}{\sqrt{d\sec(e+fx)}}dx = \frac{2b(a+b\tan(e+fx))}{f\sqrt{d\sec(e+fx)}} + 2\int \frac{\frac{a^2}{2}-b^2+\frac{3}{2}ab\tan(e+fx)}{\sqrt{d\sec(e+fx)}}dx$$
$$= -\frac{6ab}{f\sqrt{d\sec(e+fx)}} + \frac{2b(a+b\tan(e+fx))}{f\sqrt{d\sec(e+fx)}} + \left(a^2-2b^2\right)\int \frac{1}{\sqrt{d\sec(e+fx)}}dx$$
$$= -\frac{6ab}{f\sqrt{d\sec(e+fx)}} + \frac{2b(a+b\tan(e+fx))}{f\sqrt{d\sec(e+fx)}} + \frac{\left(a^2-2b^2\right)\int \sqrt{\cos(e+fx)}\,dx}{\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}}$$
$$= -\frac{6ab}{f\sqrt{d\sec(e+fx)}} + \frac{2\left(a^2-2b^2\right)E\left(\frac{1}{2}(e+fx)\middle|2\right)}{f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}} + \frac{2b(a+b\tan(e+fx))}{f\sqrt{d\sec(e+fx)}}$$

Mathematica [A] time = 0.93, size = 64, normalized size = 0.67

$$\frac{\frac{2\left(a^2-2b^2\right)E\left(\frac{1}{2}(e+fx)\middle|2\right)}{\sqrt{\cos(e+fx)}}+2b(b\tan(e+fx)-2a)}{f\sqrt{d\sec(e+fx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Tan[e + f*x])^2/Sqrt[d*Sec[e + f*x]],x]
```

```
[Out] ((2*(a^2 - 2*b^2)*EllipticE[(e + f*x)/2, 2])/Sqrt[Cos[e + f*x]] + 2*b*(-2*a
 + b*Tan[e + f*x]))/(f*Sqrt[d*Sec[e + f*x]])
```

fricas [F] time = 0.83, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(b^2\tan\left(fx+e\right)^2+2\,ab\tan\left(fx+e\right)+a^2\right)\sqrt{d\sec\left(fx+e\right)}}{d\sec\left(fx+e\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(1/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*tan(f*x + e)^2 + 2*a*b*tan(f*x + e) + a^2)*sqrt(d*sec(f*x + e
))/(d*sec(f*x + e)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\tan\left(fx+e\right)+a\right)^2}{\sqrt{d\sec\left(fx+e\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*tan(f*x + e) + a)^2/sqrt(d*sec(f*x + e)), x)
```

maple [C] time = 0.97, size = 2564, normalized size = 26.99

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(1/2),x)
```

```
[Out] 1/f*(-1+cos(f*x+e))*(2*I*cos(f*x+e)^4*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e)
)^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*Ellip
ticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a^2+2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(
3/2)*b^2+16*I*cos(f*x+e)^3*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*
(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticE(I*(-1+
cos(f*x+e))/sin(f*x+e),I)*b^2+12*I*cos(f*x+e)^2*sin(f*x+e)*(-cos(f*x+e)/(1+
cos(f*x+e))^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(
1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a^2-24*I*cos(f*x+e)^2*sin(f*
x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x
+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*b^2-12*
I*cos(f*x+e)^2*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(f*
x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticE(I*(-1+cos(f*x+e))/
sin(f*x+e),I)*a^2+24*I*cos(f*x+e)^2*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^
2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*Ellipti
cE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*b^2+8*I*cos(f*x+e)*sin(f*x+e)*(-cos(f*x+
e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+
e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a^2-16*I*cos(f*x+e)*si
n(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos
(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*b^2
-8*I*cos(f*x+e)*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(f
*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticE(I*(-1+cos(f*x+e))
/sin(f*x+e),I)*a^2+16*I*cos(f*x+e)*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2
)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*Elliptic
E(I*(-1+cos(f*x+e))/sin(f*x+e),I)*b^2-4*I*cos(f*x+e)^4*sin(f*x+e)*(-cos(f*x
+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x
+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*b^2-2*I*cos(f*x+e)^4*
sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(c
os(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a
^2+4*I*cos(f*x+e)^4*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+c
os(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticE(I*(-1+cos(f*x
+e))/sin(f*x+e),I)*b^2+8*I*cos(f*x+e)^3*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+
e))^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*Ell
ipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a^2-16*I*cos(f*x+e)^3*sin(f*x+e)*(-c
os(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+c
os(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*b^2-8*I*cos(f*x
+e)^3*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(f*x+e)))^(1
/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e
),I)*a^2+2*I*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*
(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)
*a^2*sin(f*x+e)-4*I*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(f*x+e)))
^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*
x+e),I)*b^2*sin(f*x+e)-2*I*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(f
*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticE(I*(-1+cos(f*x+e))
/sin(f*x+e),I)*a^2*sin(f*x+e)+4*I*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(
1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticE(I*(-1+cos(
f*x+e))/sin(f*x+e),I)*b^2*sin(f*x+e)-4*cos(f*x+e)^2*(-cos(f*x+e)/(1+cos(f*x
+e))^2)^(3/2)*b^2+4*cos(f*x+e)^2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*a^2-4
*cos(f*x+e)^3*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*b^2+2*cos(f*x+e)*(-cos(f
*x+e)/(1+cos(f*x+e))^2)^(3/2)*b^2+2*cos(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^
2)^(3/2)*a^2-2*cos(f*x+e)^5*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*a^2+2*cos(
f*x+e)^5*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*b^2-4*cos(f*x+e)^4*(-cos(f*x+
e)/(1+cos(f*x+e))^2)^(3/2)*a^2+2*cos(f*x+e)^4*(-cos(f*x+e)/(1+cos(f*x+e))^2
)^(3/2)*b^2-12*cos(f*x+e)^2*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)
*a*b-4*cos(f*x+e)*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*a*b-a*b*l
n(-2*(2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)^2-cos(f*x+e)^2-2*(-
cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)+2*cos(f*x+e)-1)/sin(f*x+e)^2)*cos(f*x+e)
^2*sin(f*x+e)+a*b*cos(f*x+e)^2*ln(-(2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*
cos(f*x+e)^2-cos(f*x+e)^2-2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)+2*cos(f*x+
e)-1)/sin(f*x+e)^2)*sin(f*x+e)-4*cos(f*x+e)^4*sin(f*x+e)*(-cos(f*x+e)/(1+co
```

```
s(f*x+e))^2)^(3/2)*a*b-12*cos(f*x+e)^3*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e
))^2)^(3/2)*a*b)*(1+cos(f*x+e))^4*(d/cos(f*x+e))^(1/2)*(-cos(f*x+e)/(1+cos(
f*x+e))^2)^(3/2)/cos(f*x+e)^3/d/sin(f*x+e)^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\tan\left(fx+e\right)+a\right)^{2}}{\sqrt{d\sec\left(fx+e\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(1/2),x, algorithm="maxima")
[Out] integrate((b*tan(f*x + e) + a)^2/sqrt(d*sec(f*x + e)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\tan\left(e+f\,x\right)\right)^{2}}{\sqrt{\frac{d}{\cos\left(e+f\,x\right)}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(e + f*x))^2/(d/cos(e + f*x))^(1/2),x)
[Out] int((a + b*tan(e + f*x))^2/(d/cos(e + f*x))^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\tan\left(e+fx\right)\right)^{2}}{\sqrt{d\sec\left(e+fx\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))**2/(d*sec(f*x+e))**(1/2),x)
[Out] Integral((a + b*tan(e + f*x))**2/sqrt(d*sec(e + f*x)), x)
```

3.590 $\int \frac{(a+b\tan(e+fx))^2}{(d\sec(e+fx))^{3/2}}\,dx$

Optimal. Leaf size=139

$$\frac{2\left(a^2+2b^2\right)\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx)}}{3d^2f}+\frac{2\left(a^2+2b^2\right)\sin(e+fx)}{3df\sqrt{d\sec(e+fx)}}+\frac{2ab}{3f(d\sec(e+fx))^{3/2}}-\frac{2b(a}{f(c}$$

```
[Out] 2/3*a*b/f/(d*sec(f*x+e))^(3/2)+2/3*(a^2+2*b^2)*sin(f*x+e)/d/f/(d*sec(f*x+e)
)^(1/2)+2/3*(a^2+2*b^2)*(cos(1/2*e+1/2*f*x)^2)^(1/2)/cos(1/2*e+1/2*f*x)*Ell
ipticF(sin(1/2*e+1/2*f*x),2^(1/2))*cos(f*x+e)^(1/2)*(d*sec(f*x+e))^(1/2)/d^
2/f-2*b*(a+b*tan(f*x+e))/f/(d*sec(f*x+e))^(3/2)
```

Rubi [A] time = 0.16, antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3508, 3486, 3769, 3771, 2641}

$$\frac{2\left(a^2+2b^2\right)\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx)}}{3d^2f}+\frac{2\left(a^2+2b^2\right)\sin(e+fx)}{3df\sqrt{d\sec(e+fx)}}+\frac{2ab}{3f(d\sec(e+fx))^{3/2}}-\frac{2b(a}{f(c}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Tan[e + f*x])^2/(d*Sec[e + f*x])^(3/2),x]
```

```
[Out] (2*a*b)/(3*f*(d*Sec[e + f*x])^(3/2)) + (2*(a^2 + 2*b^2)*Sqrt[Cos[e + f*x]]*
EllipticF[(e + f*x)/2, 2]*Sqrt[d*Sec[e + f*x]])/(3*d^2*f) + (2*(a^2 + 2*b^2
)*Sin[e + f*x])/(3*d*f*Sqrt[d*Sec[e + f*x]]) - (2*b*(a + b*Tan[e + f*x]))/(
f*(d*Sec[e + f*x])^(3/2))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3508

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^2, x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(
m + 1)), x] + Dist[1/(m + 1), Int[(d*Sec[e + f*x])^m*(a^2*(m + 1) - b^2 + a
*b*(m + 2)*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, m}, x] && NeQ[a^2
 + b^2, 0] && NeQ[m, -1]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+b\tan(e+fx))^2}{(d\sec(e+fx))^{3/2}}\,dx = -\frac{2b(a+b\tan(e+fx))}{f(d\sec(e+fx))^{3/2}} - 2\int \frac{-\frac{a^2}{2}-b^2+\frac{1}{2}ab\tan(e+fx)}{(d\sec(e+fx))^{3/2}}\,dx$$

$$= \frac{2ab}{3f(d\sec(e+fx))^{3/2}} - \frac{2b(a+b\tan(e+fx))}{f(d\sec(e+fx))^{3/2}} - \left(-a^2-2b^2\right)\int \frac{1}{(d\sec(e+fx))^{3/2}}$$

$$= \frac{2ab}{3f(d\sec(e+fx))^{3/2}} + \frac{2\left(a^2+2b^2\right)\sin(e+fx)}{3df\sqrt{d\sec(e+fx)}} - \frac{2b(a+b\tan(e+fx))}{f(d\sec(e+fx))^{3/2}} + \frac{\left(a^2+\right.}{}$$

$$= \frac{2ab}{3f(d\sec(e+fx))^{3/2}} + \frac{2\left(a^2+2b^2\right)\sin(e+fx)}{3df\sqrt{d\sec(e+fx)}} - \frac{2b(a+b\tan(e+fx))}{f(d\sec(e+fx))^{3/2}} + \frac{\left(\left(a^2+\right.\right.}{}$$

$$= \frac{2ab}{3f(d\sec(e+fx))^{3/2}} + \frac{2\left(a^2+2b^2\right)\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx}}{3d^2f}$$

Mathematica [A] time = 0.54, size = 101, normalized size = 0.73

$$\frac{\sec^2(e+fx)\left(2\left(a^2+2b^2\right)\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)+a^2\sin(2(e+fx))-2ab\cos(2(e+fx))-2ab-b^2\,\mathrm{s}\right.}{3f(d\sec(e+fx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Tan[e + f*x])^2/(d*Sec[e + f*x])^(3/2),x]
```

```
[Out] (Sec[e + f*x]^2*(-2*a*b - 2*a*b*Cos[2*(e + f*x)] + 2*(a^2 + 2*b^2)*Sqrt[Cos
[e + f*x]]*EllipticF[(e + f*x)/2, 2] + a^2*Sin[2*(e + f*x)] - b^2*Sin[2*(e
+ f*x)]))/(3*f*(d*Sec[e + f*x])^(3/2))
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\left(b^2\tan\left(fx+e\right)^2+2\,ab\tan\left(fx+e\right)+a^2\right)\sqrt{d\sec\left(fx+e\right)}}{d^2\sec\left(fx+e\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(3/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*tan(f*x + e)^2 + 2*a*b*tan(f*x + e) + a^2)*sqrt(d*sec(f*x + e
))/(d^2*sec(f*x + e)^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\tan\left(fx+e\right)+a\right)^2}{\left(d\sec\left(fx+e\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(3/2),x, algorithm="giac")
```

[Out] integrate((b*tan(f*x + e) + a)^2/(d*sec(f*x + e))^(3/2), x)

maple [C] time = 0.88, size = 320, normalized size = 2.30

$$-\frac{2\left(-i\cos\left(fx+e\right)\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\,\sqrt{\frac{\cos\left(fx+e\right)}{1+\cos\left(fx+e\right)}}\ \mathrm{EllipticF}\left(\frac{i\left(-1+\cos\left(fx+e\right)\right)}{\sin\left(fx+e\right)},i\right)a^{2}-2i\cos\left(fx+e\right)\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\,\sqrt{\frac{\cdot}{1\cdots}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(3/2),x)

[Out] -2/3/f*(-I*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*cos(f*x+e)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a^2-2*I*cos(f*x+e)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*b^2-I*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a^2-2*I*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*b^2+2*cos(f*x+e)^2*a*b-cos(f*x+e)*sin(f*x+e)*a^2+cos(f*x+e)*sin(f*x+e)*b^2)/cos(f*x+e)^2/(d/cos(f*x+e))^(3/2)

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(b\tan\left(fx+e\right)+a\right)^{2}}{\left(d\sec\left(fx+e\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(3/2),x, algorithm="maxima")

[Out] integrate((b*tan(f*x + e) + a)^2/(d*sec(f*x + e))^(3/2), x)

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{\left(a+b\tan\left(e+f\,x\right)\right)^{2}}{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a + b*tan(e + f*x))^2/(d/cos(e + f*x))^(3/2),x)

[Out] int((a + b*tan(e + f*x))^2/(d/cos(e + f*x))^(3/2), x)

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(a+b\tan\left(e+fx\right)\right)^{2}}{\left(d\sec\left(e+fx\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*tan(f*x+e))**2/(d*sec(f*x+e))**(3/2),x)

[Out] Integral((a + b*tan(e + f*x))**2/(d*sec(e + f*x))**(3/2), x)

3.591 $\int \frac{(a+b\tan(e+fx))^2}{(d\sec(e+fx))^{5/2}}\,dx$

Optimal. Leaf size=145

$$\frac{2\left(3a^2+2b^2\right)E\left(\frac{1}{2}(e+fx)\middle|2\right)}{5d^2f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}}+\frac{2\left(3a^2+2b^2\right)\sin(e+fx)}{15df(d\sec(e+fx))^{3/2}}-\frac{2ab}{15f(d\sec(e+fx))^{5/2}}-\frac{2b(a+b\tan(e+fx))}{3f(d\sec(e+fx))^{5/2}}$$

```
[Out] -2/15*a*b/f/(d*sec(f*x+e))^(5/2)+2/15*(3*a^2+2*b^2)*sin(f*x+e)/d/f/(d*sec(f
*x+e))^(3/2)+2/5*(3*a^2+2*b^2)*(cos(1/2*e+1/2*f*x)^2)^(1/2)/cos(1/2*e+1/2*f
*x)*EllipticE(sin(1/2*e+1/2*f*x),2^(1/2))/d^2/f/cos(f*x+e)^(1/2)/(d*sec(f*x
+e))^(1/2)-2/3*b*(a+b*tan(f*x+e))/f/(d*sec(f*x+e))^(5/2)
```

Rubi [A] time = 0.17, antiderivative size = 145, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3508, 3486, 3769, 3771, 2639}

$$\frac{2\left(3a^2+2b^2\right)E\left(\frac{1}{2}(e+fx)\middle|2\right)}{5d^2f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}}+\frac{2\left(3a^2+2b^2\right)\sin(e+fx)}{15df(d\sec(e+fx))^{3/2}}-\frac{2ab}{15f(d\sec(e+fx))^{5/2}}-\frac{2b(a+b\tan(e+fx))}{3f(d\sec(e+fx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Tan[e + f*x])^2/(d*Sec[e + f*x])^(5/2),x]
```

```
[Out] (-2*a*b)/(15*f*(d*Sec[e + f*x])^(5/2)) + (2*(3*a^2 + 2*b^2)*EllipticE[(e +
f*x)/2, 2])/(5*d^2*f*Sqrt[Cos[e + f*x]]*Sqrt[d*Sec[e + f*x]]) + (2*(3*a^2 +
 2*b^2)*Sin[e + f*x])/(15*d*f*(d*Sec[e + f*x])^(3/2)) - (2*b*(a + b*Tan[e +
 f*x]))/(3*f*(d*Sec[e + f*x])^(5/2))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3508

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^2, x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(
m + 1)), x] + Dist[1/(m + 1), Int[(d*Sec[e + f*x])^m*(a^2*(m + 1) - b^2 + a
*b*(m + 2)*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, m}, x] && NeQ[a^2
 + b^2, 0] && NeQ[m, -1]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+b\tan(e+fx))^2}{(d\sec(e+fx))^{5/2}}\,dx = -\frac{2b(a+b\tan(e+fx))}{3f(d\sec(e+fx))^{5/2}} - \frac{2}{3}\int \frac{-\frac{3a^2}{2}-b^2-\frac{1}{2}ab\tan(e+fx)}{(d\sec(e+fx))^{5/2}}\,dx$$

$$= -\frac{2ab}{15f(d\sec(e+fx))^{5/2}} - \frac{2b(a+b\tan(e+fx))}{3f(d\sec(e+fx))^{5/2}} - \frac{1}{3}\left(-3a^2-2b^2\right)\int \frac{1}{(d\sec(e+fx))^{5/2}}$$

$$= -\frac{2ab}{15f(d\sec(e+fx))^{5/2}} + \frac{2\left(3a^2+2b^2\right)\sin(e+fx)}{15df(d\sec(e+fx))^{3/2}} - \frac{2b(a+b\tan(e+fx))}{3f(d\sec(e+fx))^{5/2}} + \frac{\left(3a^2\right.}{}$$

$$= -\frac{2ab}{15f(d\sec(e+fx))^{5/2}} + \frac{2\left(3a^2+2b^2\right)\sin(e+fx)}{15df(d\sec(e+fx))^{3/2}} - \frac{2b(a+b\tan(e+fx))}{3f(d\sec(e+fx))^{5/2}} + \frac{\left(3a^2\right.}{5d^2\sqrt{}}$$

$$= -\frac{2ab}{15f(d\sec(e+fx))^{5/2}} + \frac{2\left(3a^2+2b^2\right)E\left(\frac{1}{2}(e+fx)\middle|2\right)}{5d^2f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}} + \frac{2\left(3a^2+2b^2\right)\sin(e}{15df(d\sec(e+fx)}$$

Mathematica [A] time = 0.92, size = 92, normalized size = 0.63

$$\frac{\left(6a^2+4b^2\right)E\left(\frac{1}{2}(e+fx)\middle|2\right)+2\cos^{\frac{3}{2}}(e+fx)\left(\left(a^2-b^2\right)\sin(e+fx)-2ab\cos(e+fx)\right)}{5f\cos^{\frac{5}{2}}(e+fx)(d\sec(e+fx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Tan[e + f*x])^2/(d*Sec[e + f*x])^(5/2),x]
```

```
[Out] ((6*a^2 + 4*b^2)*EllipticE[(e + f*x)/2, 2] + 2*Cos[e + f*x]^(3/2)*(-2*a*b*C
os[e + f*x] + (a^2 - b^2)*Sin[e + f*x]))/(5*f*Cos[e + f*x]^(5/2)*(d*Sec[e +
 f*x])^(5/2))
```

fricas [F] time = 0.70, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(b^2\tan\left(fx+e\right)^2+2\,ab\tan\left(fx+e\right)+a^2\right)\sqrt{d\sec\left(fx+e\right)}}{d^3\sec\left(fx+e\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(5/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*tan(f*x + e)^2 + 2*a*b*tan(f*x + e) + a^2)*sqrt(d*sec(f*x + e
))/(d^3*sec(f*x + e)^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\tan\left(fx+e\right)+a\right)^2}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*tan(f*x + e) + a)^2/(d*sec(f*x + e))^(5/2), x)
```

maple [C] time = 0.88, size = 670, normalized size = 4.62

$$-\frac{2\left(-3i\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\,\sqrt{\frac{\cos\left(fx+e\right)}{1+\cos\left(fx+e\right)}}\,\cos\left(fx+e\right)\sin\left(fx+e\right)\mathrm{EllipticF}\left(\frac{i\left(-1+\cos\left(fx+e\right)\right)}{\sin\left(fx+e\right)},i\right)a^2-2i\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(5/2),x)
```

```
[Out] -2/5/f*(-3*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*cos
(f*x+e)*sin(f*x+e)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a^2-2*I*(1/(1+
cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*cos(f*x+e)*sin(f*x+e)*
EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*b^2+3*I*(1/(1+cos(f*x+e)))^(1/2)*
(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*cos(f*x+e)*sin(f*x+e)*EllipticE(I*(-1+cos
(f*x+e))/sin(f*x+e),I)*a^2+2*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(
f*x+e)))^(1/2)*cos(f*x+e)*sin(f*x+e)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e)
,I)*b^2-3*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*sin(
f*x+e)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a^2-2*I*(1/(1+cos(f*x+e)))
^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*sin(f*x+e)*EllipticF(I*(-1+cos(f*x
+e))/sin(f*x+e),I)*b^2+3*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+
e)))^(1/2)*sin(f*x+e)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a^2+2*I*(1/
(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*sin(f*x+e)*Elliptic
E(I*(-1+cos(f*x+e))/sin(f*x+e),I)*b^2+cos(f*x+e)^4*a^2-cos(f*x+e)^4*b^2+2*c
os(f*x+e)^3*sin(f*x+e)*a*b+2*a^2*cos(f*x+e)^2+3*b^2*cos(f*x+e)^2-3*cos(f*x+
e)*a^2-2*cos(f*x+e)*b^2)/cos(f*x+e)^3/sin(f*x+e)/(d/cos(f*x+e))^(5/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\tan\left(fx+e\right)+a\right)^2}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((b*tan(f*x + e) + a)^2/(d*sec(f*x + e))^(5/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\tan\left(e+f\,x\right)\right)^2}{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(e + f*x))^2/(d/cos(e + f*x))^(5/2),x)
```

```
[Out] int((a + b*tan(e + f*x))^2/(d/cos(e + f*x))^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\tan\left(e+fx\right)\right)^2}{\left(d\sec\left(e+fx\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))**2/(d*sec(f*x+e))**(5/2),x)
```

```
[Out] Integral((a + b*tan(e + f*x))**2/(d*sec(e + f*x))**(5/2), x)
```

3.592 $\int \frac{(a+b\tan(e+fx))^2}{(d\sec(e+fx))^{7/2}}\,dx$

Optimal. Leaf size=184

$$\frac{2\left(5a^2+2b^2\right)\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx)}}{21d^4f}+\frac{2\left(5a^2+2b^2\right)\sin(e+fx)}{21d^3f\sqrt{d\sec(e+fx)}}+\frac{2\left(5a^2+2b^2\right)\sin(e+}{35df(d\sec(e+fx)}$$

```
[Out] -6/35*a*b/f/(d*sec(f*x+e))^(7/2)+2/35*(5*a^2+2*b^2)*sin(f*x+e)/d/f/(d*sec(f
*x+e))^(5/2)+2/21*(5*a^2+2*b^2)*sin(f*x+e)/d^3/f/(d*sec(f*x+e))^(1/2)+2/21*
(5*a^2+2*b^2)*(cos(1/2*e+1/2*f*x)^2)^(1/2)/cos(1/2*e+1/2*f*x)*EllipticF(sin
(1/2*e+1/2*f*x),2^(1/2))*cos(f*x+e)^(1/2)*(d*sec(f*x+e))^(1/2)/d^4/f-2/5*b*
(a+b*tan(f*x+e))/f/(d*sec(f*x+e))^(7/2)
```

Rubi [A] time = 0.19, antiderivative size = 184, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3508, 3486, 3769, 3771, 2641}

$$\frac{2\left(5a^2+2b^2\right)\sin(e+fx)}{21d^3f\sqrt{d\sec(e+fx)}}+\frac{2\left(5a^2+2b^2\right)\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+fx)}}{21d^4f}+\frac{2\left(5a^2+2b^2\right)\sin(e+}{35df(d\sec(e+fx)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Tan[e + f*x])^2/(d*Sec[e + f*x])^(7/2),x]
```

```
[Out] (-6*a*b)/(35*f*(d*Sec[e + f*x])^(7/2)) + (2*(5*a^2 + 2*b^2)*Sqrt[Cos[e + f*
x]]*EllipticF[(e + f*x)/2, 2]*Sqrt[d*Sec[e + f*x]])/(21*d^4*f) + (2*(5*a^2
+ 2*b^2)*Sin[e + f*x])/(35*d*f*(d*Sec[e + f*x])^(5/2)) + (2*(5*a^2 + 2*b^2)
*Sin[e + f*x])/(21*d^3*f*Sqrt[d*Sec[e + f*x]]) - (2*b*(a + b*Tan[e + f*x]))
/(5*f*(d*Sec[e + f*x])^(7/2))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3508

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^2, x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(
m + 1)), x] + Dist[1/(m + 1), Int[(d*Sec[e + f*x])^m*(a^2*(m + 1) - b^2 + a
*b*(m + 2)*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, m}, x] && NeQ[a^2
 + b^2, 0] && NeQ[m, -1]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+b\tan(e+fx))^2}{(d\sec(e+fx))^{7/2}}\,dx = -\frac{2b(a+b\tan(e+fx))}{5f(d\sec(e+fx))^{7/2}} - \frac{2}{5}\int \frac{-\frac{5a^2}{2}-b^2-\frac{3}{2}ab\tan(e+fx)}{(d\sec(e+fx))^{7/2}}\,dx$$

$$= -\frac{6ab}{35f(d\sec(e+fx))^{7/2}} - \frac{2b(a+b\tan(e+fx))}{5f(d\sec(e+fx))^{7/2}} - \frac{1}{5}\left(-5a^2-2b^2\right)\int \frac{1}{(d\sec(e+fx))}$$

$$= -\frac{6ab}{35f(d\sec(e+fx))^{7/2}} + \frac{2\left(5a^2+2b^2\right)\sin(e+fx)}{35df(d\sec(e+fx))^{5/2}} - \frac{2b(a+b\tan(e+fx))}{5f(d\sec(e+fx))^{7/2}} + \frac{\left(5a^2\right.}{}$$

$$= -\frac{6ab}{35f(d\sec(e+fx))^{7/2}} + \frac{2\left(5a^2+2b^2\right)\sin(e+fx)}{35df(d\sec(e+fx))^{5/2}} + \frac{2\left(5a^2+2b^2\right)\sin(e+fx)}{21d^3f\sqrt{d\sec(e+fx)}} - \frac{2}{5}$$

$$= -\frac{6ab}{35f(d\sec(e+fx))^{7/2}} + \frac{2\left(5a^2+2b^2\right)\sin(e+fx)}{35df(d\sec(e+fx))^{5/2}} + \frac{2\left(5a^2+2b^2\right)\sin(e+fx)}{21d^3f\sqrt{d\sec(e+fx)}} - \frac{2}{5}$$

$$= -\frac{6ab}{35f(d\sec(e+fx))^{7/2}} + \frac{2\left(5a^2+2b^2\right)\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)\sqrt{d\sec(e+f}}{21d^4f}$$

Mathematica [A] time = 2.25, size = 127, normalized size = 0.69

$$\frac{\frac{4\left(5a^2+2b^2\right)F\left(\frac{1}{2}(e+fx)\middle|2\right)}{\sqrt{\cos(e+fx)}} + 23a^2\sin(e+fx) + 3a^2\sin(3(e+fx)) - 18ab\cos(e+fx) - 6ab\cos(3(e+fx)) + 5b^2\sin(e}{42d^3f\sqrt{d\sec(e+fx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Tan[e + f*x])^2/(d*Sec[e + f*x])^(7/2),x]
```

```
[Out] (-18*a*b*Cos[e + f*x] - 6*a*b*Cos[3*(e + f*x)] + (4*(5*a^2 + 2*b^2)*Ellipti
cF[(e + f*x)/2, 2])/Sqrt[Cos[e + f*x]] + 23*a^2*Sin[e + f*x] + 5*b^2*Sin[e
+ f*x] + 3*a^2*Sin[3*(e + f*x)] - 3*b^2*Sin[3*(e + f*x)])/(42*d^3*f*Sqrt[d*
Sec[e + f*x]])
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\left(b^2\tan\left(fx+e\right)^2 + 2\,ab\tan\left(fx+e\right) + a^2\right)\sqrt{d\sec\left(fx+e\right)}}{d^4\sec\left(fx+e\right)^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(7/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*tan(f*x + e)^2 + 2*a*b*tan(f*x + e) + a^2)*sqrt(d*sec(f*x + e
))/(d^4*sec(f*x + e)^4), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\tan\left(fx+e\right)+a\right)^2}{\left(d\sec\left(fx+e\right)\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(7/2),x, algorithm="giac")
[Out] integrate((b*tan(f*x + e) + a)^2/(d*sec(f*x + e))^(7/2), x)
```

maple [C] time = 0.96, size = 359, normalized size = 1.95

$$-\frac{2\left(-5i\cos\left(fx+e\right)\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\,\sqrt{\frac{\cos\left(fx+e\right)}{1+\cos\left(fx+e\right)}}\,\mathrm{EllipticF}\left(\frac{i\left(-1+\cos\left(fx+e\right)\right)}{\sin\left(fx+e\right)},i\right)a^{2}-2i\cos\left(fx+e\right)\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(7/2),x)
[Out] -2/21/f*(-5*I*cos(f*x+e)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)
))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a^2-2*I*cos(f*x+e)*(1/(1
+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f
*x+e))/sin(f*x+e),I)*b^2+6*cos(f*x+e)^4*a*b-3*cos(f*x+e)^3*sin(f*x+e)*a^2+3
*cos(f*x+e)^3*sin(f*x+e)*b^2-5*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+co
s(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a^2-2*I*Elliptic
F(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+c
os(f*x+e)))^(1/2)*b^2-5*cos(f*x+e)*sin(f*x+e)*a^2-2*cos(f*x+e)*sin(f*x+e)*b
^2)/cos(f*x+e)^4/(d/cos(f*x+e))^(7/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\tan\left(fx+e\right)+a\right)^{2}}{\left(d\sec\left(fx+e\right)\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(7/2),x, algorithm="maxima")
[Out] integrate((b*tan(f*x + e) + a)^2/(d*sec(f*x + e))^(7/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\tan\left(e+f\,x\right)\right)^{2}}{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{7/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(e + f*x))^2/(d/cos(e + f*x))^(7/2),x)
[Out] int((a + b*tan(e + f*x))^2/(d/cos(e + f*x))^(7/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\tan\left(e+fx\right)\right)^{2}}{\left(d\sec\left(e+fx\right)\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))**2/(d*sec(f*x+e))**(7/2),x)
[Out] Integral((a + b*tan(e + f*x))**2/(d*sec(e + f*x))**(7/2), x)
```

3.593 $\int \frac{(a+b\tan(e+fx))^2}{(d\sec(e+fx))^{9/2}}\,dx$

Optimal. Leaf size=184

$$\frac{2\left(7a^2+2b^2\right)E\left(\frac{1}{2}(e+fx)\middle|2\right)}{15d^4f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}}+\frac{2\left(7a^2+2b^2\right)\sin(e+fx)}{45d^3f(d\sec(e+fx))^{3/2}}+\frac{2\left(7a^2+2b^2\right)\sin(e+fx)}{63df(d\sec(e+fx))^{7/2}}-\frac{10ab}{63f(d\sec(e+fx))^{9/2}}$$

```
[Out] -10/63*a*b/f/(d*sec(f*x+e))^(9/2)+2/63*(7*a^2+2*b^2)*sin(f*x+e)/d/f/(d*sec(
f*x+e))^(7/2)+2/45*(7*a^2+2*b^2)*sin(f*x+e)/d^3/f/(d*sec(f*x+e))^(3/2)+2/15
*(7*a^2+2*b^2)*(cos(1/2*e+1/2*f*x)^2)^(1/2)/cos(1/2*e+1/2*f*x)*EllipticE(si
n(1/2*e+1/2*f*x),2^(1/2))/d^4/f/cos(f*x+e)^(1/2)/(d*sec(f*x+e))^(1/2)-2/7*b
*(a+b*tan(f*x+e))/f/(d*sec(f*x+e))^(9/2)
```

Rubi [A] time = 0.19, antiderivative size = 184, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3508, 3486, 3769, 3771, 2639}

$$\frac{2\left(7a^2+2b^2\right)\sin(e+fx)}{45d^3f(d\sec(e+fx))^{3/2}}+\frac{2\left(7a^2+2b^2\right)E\left(\frac{1}{2}(e+fx)\middle|2\right)}{15d^4f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}}+\frac{2\left(7a^2+2b^2\right)\sin(e+fx)}{63df(d\sec(e+fx))^{7/2}}-\frac{10ab}{63f(d\sec(e+fx))^{9/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Tan[e + f*x])^2/(d*Sec[e + f*x])^(9/2),x]
```

```
[Out] (-10*a*b)/(63*f*(d*Sec[e + f*x])^(9/2)) + (2*(7*a^2 + 2*b^2)*EllipticE[(e +
 f*x)/2, 2])/(15*d^4*f*Sqrt[Cos[e + f*x]]*Sqrt[d*Sec[e + f*x]]) + (2*(7*a^2
 + 2*b^2)*Sin[e + f*x])/(63*d*f*(d*Sec[e + f*x])^(7/2)) + (2*(7*a^2 + 2*b^2
)*Sin[e + f*x])/(45*d^3*f*(d*Sec[e + f*x])^(3/2)) - (2*b*(a + b*Tan[e + f*x
]))/(7*f*(d*Sec[e + f*x])^(9/2))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3508

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^2, x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(
m + 1)), x] + Dist[1/(m + 1), Int[(d*Sec[e + f*x])^m*(a^2*(m + 1) - b^2 + a
*b*(m + 2)*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, m}, x] && NeQ[a^2
 + b^2, 0] && NeQ[m, -1]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(a+b\tan(e+fx))^2}{(d\sec(e+fx))^{9/2}}\,dx = -\frac{2b(a+b\tan(e+fx))}{7f(d\sec(e+fx))^{9/2}} - \frac{2}{7}\int \frac{-\frac{7a^2}{2}-b^2-\frac{5}{2}ab\tan(e+fx)}{(d\sec(e+fx))^{9/2}}\,dx$$

$$= -\frac{10ab}{63f(d\sec(e+fx))^{9/2}} - \frac{2b(a+b\tan(e+fx))}{7f(d\sec(e+fx))^{9/2}} - \frac{1}{7}\left(-7a^2-2b^2\right)\int \frac{1}{(d\sec(e+f$$

$$= -\frac{10ab}{63f(d\sec(e+fx))^{9/2}} + \frac{2\left(7a^2+2b^2\right)\sin(e+fx)}{63df(d\sec(e+fx))^{7/2}} - \frac{2b(a+b\tan(e+fx))}{7f(d\sec(e+fx))^{9/2}} + \frac{(7}{}$$

$$= -\frac{10ab}{63f(d\sec(e+fx))^{9/2}} + \frac{2\left(7a^2+2b^2\right)\sin(e+fx)}{63df(d\sec(e+fx))^{7/2}} + \frac{2\left(7a^2+2b^2\right)\sin(e+fx)}{45d^3f(d\sec(e+fx))^{3/2}}$$

$$= -\frac{10ab}{63f(d\sec(e+fx))^{9/2}} + \frac{2\left(7a^2+2b^2\right)\sin(e+fx)}{63df(d\sec(e+fx))^{7/2}} + \frac{2\left(7a^2+2b^2\right)\sin(e+fx)}{45d^3f(d\sec(e+fx))^{3/2}}$$

$$= -\frac{10ab}{63f(d\sec(e+fx))^{9/2}} + \frac{2\left(7a^2+2b^2\right)E\left(\frac{1}{2}(e+fx)\middle|2\right)}{15d^4f\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}} + \frac{2\left(7a^2+2b^2\right)\sin}{63df(d\sec(e+}$$

Mathematica [A] time = 2.82, size = 126, normalized size = 0.68

$$\frac{4\cos(e+fx)\left(2\sin(e+fx)\left(5\left(a^2-b^2\right)\cos(2(e+fx))+19a^2-b^2\right)-30ab\cos(e+fx)-10ab\cos(3(e+fx))\right)}{360d^4f\sqrt{d\sec(e+fx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Tan[e + f*x])^2/(d*Sec[e + f*x])^(9/2),x]
```

```
[Out] ((48*(7*a^2 + 2*b^2)*EllipticE[(e + f*x)/2, 2])/Sqrt[Cos[e + f*x]] + 4*Cos[
e + f*x]*(-30*a*b*Cos[e + f*x] - 10*a*b*Cos[3*(e + f*x)] + 2*(19*a^2 - b^2
+ 5*(a^2 - b^2)*Cos[2*(e + f*x)])*Sin[e + f*x]))/(360*d^4*f*Sqrt[d*Sec[e +
f*x]])
```

fricas [F] time = 0.60, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(b^2\tan\left(fx+e\right)^2+2\,ab\tan\left(fx+e\right)+a^2\right)\sqrt{d\sec\left(fx+e\right)}}{d^5\sec\left(fx+e\right)^5},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(9/2),x, algorithm="fricas")
```

```
[Out] integral((b^2*tan(f*x + e)^2 + 2*a*b*tan(f*x + e) + a^2)*sqrt(d*sec(f*x + e
))/(d^5*sec(f*x + e)^5), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\tan\left(fx+e\right)+a\right)^2}{\left(d\sec\left(fx+e\right)\right)^{\frac{9}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(9/2),x, algorithm="giac")
```

```
[Out] integrate((b*tan(f*x + e) + a)^2/(d*sec(f*x + e))^(9/2), x)
```

maple [C] time = 1.00, size = 697, normalized size = 3.79

$$-\frac{2\left(5\left(\cos^{6}\left(fx+e\right)\right)a^{2}-5\left(\cos^{6}\left(fx+e\right)\right)b^{2}+10\left(\cos^{5}\left(fx+e\right)\right)\sin\left(fx+e\right)ab-21i\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\sqrt{\frac{\cos\left(fx+e\right)}{1+\cos\left(fx+e\right)}}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(9/2),x)
```

```
[Out] -2/45/f*(5*cos(f*x+e)^6*a^2-5*cos(f*x+e)^6*b^2+10*cos(f*x+e)^5*sin(f*x+e)*a
*b-6*I*sin(f*x+e)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(1/(1+cos(f*x+e
)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*b^2+21*I*sin(f*x+e)*EllipticE(I
*(-1+cos(f*x+e))/sin(f*x+e),I)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(
f*x+e)))^(1/2)*a^2-6*I*cos(f*x+e)*sin(f*x+e)*EllipticF(I*(-1+cos(f*x+e))/si
n(f*x+e),I)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*b^2-
21*I*cos(f*x+e)*sin(f*x+e)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(1/(1+
cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a^2-21*I*sin(f*x+e)*El
lipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e
)/(1+cos(f*x+e)))^(1/2)*a^2+21*I*cos(f*x+e)*sin(f*x+e)*EllipticE(I*(-1+cos(
f*x+e))/sin(f*x+e),I)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^
(1/2)*a^2+6*I*cos(f*x+e)*sin(f*x+e)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),
I)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*b^2+6*I*sin(f
*x+e)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(1/(1+cos(f*x+e)))^(1/2)*(c
os(f*x+e)/(1+cos(f*x+e)))^(1/2)*b^2+2*cos(f*x+e)^4*a^2+7*cos(f*x+e)^4*b^2+1
4*a^2*cos(f*x+e)^2+4*b^2*cos(f*x+e)^2-21*cos(f*x+e)*a^2-6*cos(f*x+e)*b^2)/c
os(f*x+e)^5/sin(f*x+e)/(d/cos(f*x+e))^(9/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\tan\left(fx+e\right)+a\right)^{2}}{\left(d\sec\left(fx+e\right)\right)^{\frac{9}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(9/2),x, algorithm="maxima")
```

```
[Out] integrate((b*tan(f*x + e) + a)^2/(d*sec(f*x + e))^(9/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\tan\left(e+f\,x\right)\right)^2}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{9/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(e + f*x))^2/(d/cos(e + f*x))^(9/2),x)
```

```
[Out] int((a + b*tan(e + f*x))^2/(d/cos(e + f*x))^(9/2), x)
```

<u>**sympy**</u> **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))**2/(d*sec(f*x+e))**(9/2),x)
```

```
[Out] Timed out
```

3.594 $\int (d\sec(e+fx))^{5/2}(a+b\tan(e+fx))^3\,dx$

Optimal. Leaf size=198

$$\frac{2bd^2\sec^2(e+fx)\sqrt{d\sec(e+fx)}\left(14\left(11a^2-2b^2\right)+65ab\tan(e+fx)\right)}{315f}+\frac{2ad^2\left(7a^2-6b^2\right)\tan(e+fx)\sqrt{d\sec(e+}$$

```
[Out] 2/21*a*(7*a^2-6*b^2)*d^2*(cos(1/2*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arct
an(tan(f*x+e)))*EllipticF(sin(1/2*arctan(tan(f*x+e))),2^(1/2))*(d*sec(f*x+e
))^(1/2)/f/(sec(f*x+e)^2)^(1/4)+2/21*a*(7*a^2-6*b^2)*d^2*(d*sec(f*x+e))^(1/
2)*tan(f*x+e)/f+2/9*b*d^2*sec(f*x+e)^2*(d*sec(f*x+e))^(1/2)*(a+b*tan(f*x+e)
)^2/f+2/315*b*d^2*sec(f*x+e)^2*(d*sec(f*x+e))^(1/2)*(154*a^2-28*b^2+65*a*b*
tan(f*x+e))/f
```

Rubi [A] time = 0.15, antiderivative size = 198, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3512, 743, 780, 195, 231}

$$\frac{2bd^2\sec^2(e+fx)\sqrt{d\sec(e+fx)}\left(14\left(11a^2-2b^2\right)+65ab\tan(e+fx)\right)}{315f}+\frac{2ad^2\left(7a^2-6b^2\right)\tan(e+fx)\sqrt{d\sec(e+}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(5/2)*(a + b*Tan[e + f*x])^3,x]
```

```
[Out] (2*a*(7*a^2 - 6*b^2)*d^2*EllipticF[ArcTan[Tan[e + f*x]]/2, 2]*Sqrt[d*Sec[e
+ f*x]])/(21*f*(Sec[e + f*x]^2)^(1/4)) + (2*a*(7*a^2 - 6*b^2)*d^2*Sqrt[d*Se
c[e + f*x]]*Tan[e + f*x])/(21*f) + (2*b*d^2*Sec[e + f*x]^2*Sqrt[d*Sec[e + f
*x]]*(a + b*Tan[e + f*x])^2)/(9*f) + (2*b*d^2*Sec[e + f*x]^2*Sqrt[d*Sec[e +
 f*x]]*(14*(11*a^2 - 2*b^2) + 65*a*b*Tan[e + f*x]))/(315*f)
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 231

```
Int[((a_) + (b_.)*(x_)^2)^(-3/4), x_Symbol] :> Simp[(2*EllipticF[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(3/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 743

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m - 1)*(a + c*x^2)^(p + 1))/(c*(m + 2*p + 1)), x] + Dist[1/(c
*(m + 2*p + 1)), Int[(d + e*x)^(m - 2)*Simp[c*d^2*(m + 2*p + 1) - a*e^2*(m
- 1) + 2*c*d*e*(m + p)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m,
 p}, x] && NeQ[c*d^2 + a*e^2, 0] && If[RationalQ[m], GtQ[m, 1], SumSimplerQ
[m, -2]] && NeQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 780

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[(((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*(a + c*x^2)^(p
+ 1))/(2*c*(p + 1)*(2*p + 3)), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
```

```
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int (d\sec(e+fx))^{5/2}(a+b\tan(e+fx))^3\,dx = \frac{\left(d^2\sqrt{d\sec(e+fx)}\right)\text{Subst}\left(\int (a+x)^3\sqrt[4]{1+\frac{x^2}{b^2}}\,dx, x, b\tan(e+f x\right.}{bf\sqrt[4]{\sec^2(e+fx)}}$$

$$= \frac{2bd^2\sec^2(e+fx)\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^2}{9f} + \frac{\left(2bd^2\sqrt{\right.}{}$$

$$= \frac{2bd^2\sec^2(e+fx)\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^2}{9f} + \frac{2bd^2\sec}{}$$

$$= \frac{2a\left(7a^2-6b^2\right)d^2\sqrt{d\sec(e+fx)}\,\tan(e+fx)}{21f} + \frac{2bd^2\sec^2(e+fx}{}$$

$$= \frac{2a\left(7a^2-6b^2\right)d^2F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{21f\sqrt[4]{\sec^2(e+fx)}} + \frac{2}{}$$

Mathematica [A] time = 1.70, size = 157, normalized size = 0.79

$$-\frac{2d(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))^3\left(63b\left(b^2-3a^2\right)\cos^2(e+fx)-15a\left(7a^2-6b^2\right)\cos^{\frac{9}{2}}(e+fx)F\left(\frac{1}{2}(e+\right.\right.}{315f(a\cos(e+fx)+b\sin(e+}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(5/2)*(a + b*Tan[e + f*x])^3,x]
```

```
[Out] (-2*d*(d*Sec[e + f*x])^(3/2)*(63*b*(-3*a^2 + b^2)*Cos[e + f*x]^2 - 15*a*(7*
a^2 - 6*b^2)*Cos[e + f*x]^(9/2)*EllipticF[(e + f*x)/2, 2] - 15*a*(7*a^2 - 6
*b^2)*Cos[e + f*x]^3*Sin[e + f*x] - (5*b^2*(14*b + 27*a*Sin[2*(e + f*x)]))/
2)*(a + b*Tan[e + f*x])^3)/(315*f*(a*Cos[e + f*x] + b*Sin[e + f*x])^3)
```

fricas [F] time = 0.79, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(b^3d^2\sec\left(fx+e\right)^2\tan\left(fx+e\right)^3+3\,ab^2d^2\sec\left(fx+e\right)^2\tan\left(fx+e\right)^2+3\,a^2bd^2\sec\left(fx+e\right)^2\tan\left(\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/2)*(a+b*tan(f*x+e))^3,x, algorithm="fricas")
```

```
[Out] integral((b^3*d^2*sec(f*x + e)^2*tan(f*x + e)^3 + 3*a*b^2*d^2*sec(f*x + e)^
2*tan(f*x + e)^2 + 3*a^2*b*d^2*sec(f*x + e)^2*tan(f*x + e) + a^3*d^2*sec(f*
x + e)^2)*sqrt(d*sec(f*x + e)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{5}{2}}\left(b\tan\left(fx+e\right)+a\right)^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/2)*(a+b*tan(f*x+e))^3,x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(5/2)*(b*tan(f*x + e) + a)^3, x)
```

maple [C] time = 1.05, size = 414, normalized size = 2.09

$$\frac{2\left(1+\cos\left(fx+e\right)\right)^{2}\left(-1+\cos\left(fx+e\right)\right)^{2}\left(105i\left(\cos^{5}\left(fx+e\right)\right)\mathrm{EllipticF}\left(\frac{i\left(-1+\cos\left(fx+e\right)\right)}{\sin\left(fx+e\right)},i\right)\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\sqrt{\frac{\cos(}{1+\cos}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(5/2)*(a+b*tan(f*x+e))^3,x)
```

```
[Out] 2/315/f*(1+cos(f*x+e))^2*(-1+cos(f*x+e))^2*(105*I*cos(f*x+e)^5*EllipticF(I*
(-1+cos(f*x+e))/sin(f*x+e),I)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f
*x+e)))^(1/2)*a^3-90*I*cos(f*x+e)^5*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),
I)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a*b^2+105*I*c
os(f*x+e)^4*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(1/(1+cos(f*x+e)))^(1
/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a^3-90*I*cos(f*x+e)^4*EllipticF(I*(-1
+cos(f*x+e))/sin(f*x+e),I)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+
e)))^(1/2)*a*b^2+105*cos(f*x+e)^3*sin(f*x+e)*a^3-90*cos(f*x+e)^3*sin(f*x+e)
*a*b^2+189*a^2*cos(f*x+e)^2*b-63*b^3*cos(f*x+e)^2+135*cos(f*x+e)*sin(f*x+e)
*a*b^2+35*b^3)*(d/cos(f*x+e))^(5/2)/cos(f*x+e)^2/sin(f*x+e)^4
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/2)*(a+b*tan(f*x+e))^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{5/2}\,{\left(a+b\,\mathrm{tan}\left(e+f\,x\right)\right)}^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(5/2)*(a + b*tan(e + f*x))^3,x)
```

```
[Out] int((d/cos(e + f*x))^(5/2)*(a + b*tan(e + f*x))^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(5/2)*(a+b*tan(f*x+e))**3,x)
```

```
[Out] Timed out
```

3.595 $\int (d\sec(e+fx))^{3/2}(a+b\tan(e+fx))^3\,dx$

Optimal. Leaf size=176

$$\frac{2b(d\sec(e+fx))^{3/2}\left(10\left(9a^2-2b^2\right)+33ab\tan(e+fx)\right)}{105f}+\frac{2a\left(5a^2-6b^2\right)\sin(e+fx)\cos(e+fx)(d\sec(e+fx))^{3/2}}{5f}$$

```
[Out] -2/5*a*(5*a^2-6*b^2)*(cos(1/2*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arctan(t
an(f*x+e)))*EllipticE(sin(1/2*arctan(tan(f*x+e))),2^(1/2))*(d*sec(f*x+e))^(
3/2)/f/(sec(f*x+e)^2)^(3/4)+2/5*a*(5*a^2-6*b^2)*cos(f*x+e)*(d*sec(f*x+e))^(
3/2)*sin(f*x+e)/f+2/7*b*(d*sec(f*x+e))^(3/2)*(a+b*tan(f*x+e))^2/f+2/105*b*(
d*sec(f*x+e))^(3/2)*(90*a^2-20*b^2+33*a*b*tan(f*x+e))/f
```

Rubi [A] time = 0.15, antiderivative size = 176, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3512, 743, 780, 227, 196}

$$\frac{2b(d\sec(e+fx))^{3/2}\left(10\left(9a^2-2b^2\right)+33ab\tan(e+fx)\right)}{105f}+\frac{2a\left(5a^2-6b^2\right)\sin(e+fx)\cos(e+fx)(d\sec(e+fx))^{3/2}}{5f}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(3/2)*(a + b*Tan[e + f*x])^3,x]
```

```
[Out] (-2*a*(5*a^2 - 6*b^2)*EllipticE[ArcTan[Tan[e + f*x]]/2, 2]*(d*Sec[e + f*x])
^(3/2))/(5*f*(Sec[e + f*x]^2)^(3/4)) + (2*a*(5*a^2 - 6*b^2)*Cos[e + f*x]*(d
*Sec[e + f*x])^(3/2)*Sin[e + f*x])/(5*f) + (2*b*(d*Sec[e + f*x])^(3/2)*(a +
 b*Tan[e + f*x])^2)/(7*f) + (2*b*(d*Sec[e + f*x])^(3/2)*(10*(9*a^2 - 2*b^2)
 + 33*a*b*Tan[e + f*x]))/(105*f)
```

Rule 196

```
Int[((a_) + (b_.)*(x_)^2)^(-5/4), x_Symbol] :> Simp[(2*EllipticE[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(5/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 227

```
Int[((a_) + (b_.)*(x_)^2)^(-1/4), x_Symbol] :> Simp[(2*x)/(a + b*x^2)^(1/4)
, x] - Dist[a, Int[1/(a + b*x^2)^(5/4), x], x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 743

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m - 1)*(a + c*x^2)^(p + 1))/(c*(m + 2*p + 1)), x] + Dist[1/(c
*(m + 2*p + 1)), Int[(d + e*x)^(m - 2)*Simp[c*d^2*(m + 2*p + 1) - a*e^2*(m
- 1) + 2*c*d*e*(m + p)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m,
 p}, x] && NeQ[c*d^2 + a*e^2, 0] && If[RationalQ[m], GtQ[m, 1], SumSimplerQ
[m, -2]] && NeQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 780

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[(((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*(a + c*x^2)^(p
+ 1))/(2*c*(p + 1)*(2*p + 3)), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] && !IntegerQ[m/2]
```

Rubi steps

$$\int (d\sec(e+fx))^{3/2}(a+b\tan(e+fx))^3\,dx = \frac{(d\sec(e+fx))^{3/2}\,\text{Subst}\left(\int \frac{(a+x)^3}{\sqrt[4]{1+\frac{x^2}{b^2}}}\,dx, x, b\tan(e+fx)\right)}{bf\sec^2(e+fx)^{3/4}}$$

$$= \frac{2b(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))^2}{7f} + \frac{\left(2b(d\sec(e+fx))^{3/2}\right)}{}$$

$$= \frac{2b(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))^2}{7f} + \frac{2b(d\sec(e+fx))^{3/2}\left(\right.}{}$$

$$= \frac{2a\left(5a^2-6b^2\right)\cos(e+fx)(d\sec(e+fx))^{3/2}\sin(e+fx)}{5f} + \frac{2b(d\,s}{}$$

$$= -\frac{2a\left(5a^2-6b^2\right)E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)(d\sec(e+fx))^{3/2}}{5f\sec^2(e+fx)^{3/4}} +$$

Mathematica [A] time = 1.79, size = 155, normalized size = 0.88

$$-\frac{d\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^3\left(70b\left(b^2-3a^2\right)\cos^2(e+fx)+42a\left(5a^2-6b^2\right)\cos^{\frac{7}{2}}(e+fx)E\left(\frac{1}{2}(e+f\right.\right.}{105f(a\cos(e+fx)+b\sin(e+}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(3/2)*(a + b*Tan[e + f*x])^3,x]
```

```
[Out] -1/105*(d*Sqrt[d*Sec[e + f*x]]*(70*b*(-3*a^2 + b^2)*Cos[e + f*x]^2 + 42*a*(
5*a^2 - 6*b^2)*Cos[e + f*x]^(7/2)*EllipticE[(e + f*x)/2, 2] - 42*a*(5*a^2 -
 6*b^2)*Cos[e + f*x]^3*Sin[e + f*x] - 3*b^2*(10*b + 21*a*Sin[2*(e + f*x)]))
*(a + b*Tan[e + f*x])^3)/(f*(a*Cos[e + f*x] + b*Sin[e + f*x])^3)
```

fricas [F] time = 1.28, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(b^3d\sec\left(fx+e\right)\tan\left(fx+e\right)^3+3\,ab^2d\sec\left(fx+e\right)\tan\left(fx+e\right)^2+3\,a^2bd\sec\left(fx+e\right)\tan\left(fx+e\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(3/2)*(a+b*tan(f*x+e))^3,x, algorithm="fricas")
```

```
[Out] integral((b^3*d*sec(f*x + e)*tan(f*x + e)^3 + 3*a*b^2*d*sec(f*x + e)*tan(f*
x + e)^2 + 3*a^2*b*d*sec(f*x + e)*tan(f*x + e) + a^3*d*sec(f*x + e))*sqrt(d
*sec(f*x + e)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{3}{2}}\left(b\tan\left(fx+e\right)+a\right)^{3}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(3/2)*(a+b*tan(f*x+e))^3,x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(3/2)*(b*tan(f*x + e) + a)^3, x)
```

maple [C] time = 1.01, size = 759, normalized size = 4.31

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(3/2)*(a+b*tan(f*x+e))^3,x)
```

```
[Out] -2/105/f*(1+cos(f*x+e))^2*(-1+cos(f*x+e))^2*(-126*I*cos(f*x+e)^3*sin(f*x+e)
*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1
+cos(f*x+e))/sin(f*x+e),I)*a*b^2+126*I*cos(f*x+e)^4*sin(f*x+e)*(1/(1+cos(f*
x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticE(I*(-1+cos(f*x+e))/
sin(f*x+e),I)*a*b^2-126*I*cos(f*x+e)^4*sin(f*x+e)*(1/(1+cos(f*x+e)))^(1/2)*
(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)
*a*b^2-105*I*cos(f*x+e)^4*sin(f*x+e)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(
1+cos(f*x+e)))^(1/2)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a^3+126*I*co
s(f*x+e)^3*sin(f*x+e)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^
(1/2)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a*b^2-105*I*cos(f*x+e)^3*si
n(f*x+e)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*Ellipti
cE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a^3+105*I*cos(f*x+e)^3*sin(f*x+e)*(1/(1+
cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*
x+e))/sin(f*x+e),I)*a^3+105*I*cos(f*x+e)^4*sin(f*x+e)*(1/(1+cos(f*x+e)))^(1
/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e
),I)*a^3+105*cos(f*x+e)^4*a^3-126*cos(f*x+e)^4*a*b^2-105*a^3*cos(f*x+e)^3+1
89*a*b^2*cos(f*x+e)^3-105*a^2*cos(f*x+e)^2*b*sin(f*x+e)+35*cos(f*x+e)^2*sin
(f*x+e)*b^3-63*a*cos(f*x+e)*b^2-15*sin(f*x+e)*b^3)*(d/cos(f*x+e))^(3/2)/cos
(f*x+e)^2/sin(f*x+e)^5
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(3/2)*(a+b*tan(f*x+e))^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{3/2}\,{\left(a+b\,\tan\left(e+f\,x\right)\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(3/2)*(a + b*tan(e + f*x))^3,x)
```

```
[Out] int((d/cos(e + f*x))^(3/2)*(a + b*tan(e + f*x))^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d \sec{\left(e + f x \right)}\right)^{\frac{3}{2}} \left(a + b \tan{\left(e + f x \right)}\right)^{3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(3/2)*(a+b*tan(f*x+e))**3,x)
```

```
[Out] Integral((d*sec(e + f*x))**(3/2)*(a + b*tan(e + f*x))**3, x)
```

3.596 $\int \sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^3\,dx$

Optimal. Leaf size=129

$$\frac{2b\sqrt{d\sec(e+fx)}\,\left(2\left(7a^2-2b^2\right)+3ab\tan(e+fx)\right)}{5f}+\frac{2a\left(a^2-2b^2\right)\sqrt{d\sec(e+fx)}\,F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)}{f\sqrt[4]{\sec^2(e+fx)}}+$$

```
[Out] 2*a*(a^2-2*b^2)*(cos(1/2*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arctan(tan(f*
x+e)))*EllipticF(sin(1/2*arctan(tan(f*x+e))),2^(1/2))*(d*sec(f*x+e))^(1/2)/
f/(sec(f*x+e)^2)^(1/4)+2/5*b*(d*sec(f*x+e))^(1/2)*(a+b*tan(f*x+e))^2/f+2/5*
b*(d*sec(f*x+e))^(1/2)*(14*a^2-4*b^2+3*a*b*tan(f*x+e))/f
```

Rubi [A] time = 0.11, antiderivative size = 129, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.160$, Rules used = {3512, 743, 780, 231}

$$\frac{2b\sqrt{d\sec(e+fx)}\,\left(2\left(7a^2-2b^2\right)+3ab\tan(e+fx)\right)}{5f}+\frac{2a\left(a^2-2b^2\right)\sqrt{d\sec(e+fx)}\,F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)}{f\sqrt[4]{\sec^2(e+fx)}}+$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x])^3,x]
```

```
[Out] (2*a*(a^2 - 2*b^2)*EllipticF[ArcTan[Tan[e + f*x]]/2, 2]*Sqrt[d*Sec[e + f*x]
])/(f*(Sec[e + f*x]^2)^(1/4)) + (2*b*Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*
x])^2)/(5*f) + (2*b*Sqrt[d*Sec[e + f*x]]*(2*(7*a^2 - 2*b^2) + 3*a*b*Tan[e +
 f*x]))/(5*f)
```

Rule 231

```
Int[((a_) + (b_.)*(x_)^2)^(-3/4), x_Symbol] :> Simp[(2*EllipticF[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(3/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 743

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m - 1)*(a + c*x^2)^(p + 1))/(c*(m + 2*p + 1)), x] + Dist[1/(c
*(m + 2*p + 1)), Int[(d + e*x)^(m - 2)*Simp[c*d^2*(m + 2*p + 1) - a*e^2*(m
- 1) + 2*c*d*e*(m + p)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m,
 p}, x] && NeQ[c*d^2 + a*e^2, 0] && If[RationalQ[m], GtQ[m, 1], SumSimplerQ
[m, -2]] && NeQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 780

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[(((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*(a + c*x^2)^(p
+ 1))/(2*c*(p + 1)*(2*p + 3)), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^3\,dx = \frac{\sqrt{d\sec(e+fx)}\ \text{Subst}\left(\int \frac{(a+x)^3}{\left(1+\frac{x^2}{b^2}\right)^{3/4}}\,dx,x,b\tan(e+fx)\right)}{bf\sqrt[4]{\sec^2(e+fx)}}$$

$$= \frac{2b\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^2}{5f} + \frac{\left(2b\sqrt{d\sec(e+fx)}\right)\text{Sub}}{}$$

$$= \frac{2b\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^2}{5f} + \frac{2b\sqrt{d\sec(e+fx)}\ \left(2\left(7a\right.\right.}{}$$

$$= \frac{2a\left(a^2-2b^2\right)F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{f\sqrt[4]{\sec^2(e+fx)}} + \frac{2b\sqrt{d}}{}$$

Mathematica [A] time = 2.05, size = 132, normalized size = 1.02

$$-\frac{2\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^3\left(5b\left(b^2-3a^2\right)\cos^3(e+fx)-5a\left(a^2-2b^2\right)\cos^{\frac{7}{2}}(e+fx)F\left(\frac{1}{2}(e+fx)\middle|2\right.\right.}{5f(a\cos(e+fx)+b\sin(e+fx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x])^3,x]
```

```
[Out] (-2*Sqrt[d*Sec[e + f*x]]*(5*b*(-3*a^2 + b^2)*Cos[e + f*x]^3 - 5*a*(a^2 - 2*
b^2)*Cos[e + f*x]^(7/2)*EllipticF[(e + f*x)/2, 2] - (b^2*Cos[e + f*x]*(2*b
+ 5*a*Sin[2*(e + f*x)]))/2)*(a + b*Tan[e + f*x])^3)/(5*f*(a*Cos[e + f*x] +
b*Sin[e + f*x])^3)
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(b^3\tan\left(fx+e\right)^3+3\,ab^2\tan\left(fx+e\right)^2+3\,a^2b\tan\left(fx+e\right)+a^3\right)\sqrt{d\sec\left(fx+e\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/2)*(a+b*tan(f*x+e))^3,x, algorithm="fricas")
```

```
[Out] integral((b^3*tan(f*x + e)^3 + 3*a*b^2*tan(f*x + e)^2 + 3*a^2*b*tan(f*x + e
) + a^3)*sqrt(d*sec(f*x + e)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{d\sec\left(fx+e\right)}\left(b\tan\left(fx+e\right)+a\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/2)*(a+b*tan(f*x+e))^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(d*sec(f*x + e))*(b*tan(f*x + e) + a)^3, x)
```

maple [C] time = 1.00, size = 373, normalized size = 2.89

$$2\left(1+\cos\left(fx+e\right)\right)^{2}\left(-1+\cos\left(fx+e\right)\right)^{2}\left(5i\left(\cos^{3}\left(fx+e\right)\right)\mathrm{EllipticF}\left(\frac{i\left(-1+\cos\left(fx+e\right)\right)}{\sin\left(fx+e\right)},i\right)\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\sqrt{\frac{\cos\left(fx\right.}{1+\cos\left(f\right.}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(1/2)*(a+b*tan(f*x+e))^3,x)
```

```
[Out] 2/5/f*(1+cos(f*x+e))^2*(-1+cos(f*x+e))^2*(5*I*cos(f*x+e)^3*EllipticF(I*(-1+
cos(f*x+e))/sin(f*x+e),I)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e
)))^(1/2)*a^3-10*I*cos(f*x+e)^3*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(
1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a*b^2+5*I*cos(f*x
+e)^2*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(1/(1+cos(f*x+e)))^(1/2)*(c
os(f*x+e)/(1+cos(f*x+e)))^(1/2)*a^3-10*I*cos(f*x+e)^2*EllipticF(I*(-1+cos(f
*x+e))/sin(f*x+e),I)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(
1/2)*a*b^2+15*a^2*cos(f*x+e)^2*b-5*b^3*cos(f*x+e)^2+5*cos(f*x+e)*sin(f*x+e)
*a*b^2+b^3)*(d/cos(f*x+e))^(1/2)/cos(f*x+e)^2/sin(f*x+e)^4
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{d\sec\left(fx+e\right)}\left(b\tan\left(fx+e\right)+a\right)^{3}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/2)*(a+b*tan(f*x+e))^3,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(d*sec(f*x + e))*(b*tan(f*x + e) + a)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\sqrt{\frac{d}{\cos\left(e+f\,x\right)}}\,\left(a+b\tan\left(e+f\,x\right)\right)^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(1/2)*(a + b*tan(e + f*x))^3,x)
```

```
[Out] int((d/cos(e + f*x))^(1/2)*(a + b*tan(e + f*x))^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{d\sec\left(e+fx\right)}\left(a+b\tan\left(e+fx\right)\right)^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(1/2)*(a+b*tan(f*x+e))**3,x)
```

```
[Out] Integral(sqrt(d*sec(e + f*x))*(a + b*tan(e + f*x))**3, x)
```

3.597 $\int \frac{(a+b\tan(e+fx))^3}{\sqrt{d\sec(e+fx)}}\,dx$

Optimal. Leaf size=178

$$-\frac{2b\sec^2(e+fx)\left(2\left(3a^2-2b^2\right)+3ab\tan(e+fx)\right)}{3f\sqrt{d\sec(e+fx)}}-\frac{2a\left(a^2-6b^2\right)\tan(e+fx)}{f\sqrt{d\sec(e+fx)}}+\frac{2a\left(a^2-6b^2\right)\sqrt[4]{\sec^2(e+fx)}\,E}{f\sqrt{d\sec(e}$$

```
[Out] 2*a*(a^2-6*b^2)*(cos(1/2*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arctan(tan(f*
x+e)))*EllipticE(sin(1/2*arctan(tan(f*x+e))),2^(1/2))*(sec(f*x+e)^2)^(1/4)/
f/(d*sec(f*x+e))^(1/2)-2*a*(a^2-6*b^2)*tan(f*x+e)/f/(d*sec(f*x+e))^(1/2)-2*
(b-a*tan(f*x+e))*(a+b*tan(f*x+e))^2/f/(d*sec(f*x+e))^(1/2)-2/3*b*sec(f*x+e)
^2*(6*a^2-4*b^2+3*a*b*tan(f*x+e))/f/(d*sec(f*x+e))^(1/2)
```

Rubi [A] time = 0.14, antiderivative size = 178, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {3512, 739, 780, 227, 196}

$$-\frac{2b\sec^2(e+fx)\left(2\left(3a^2-2b^2\right)+3ab\tan(e+fx)\right)}{3f\sqrt{d\sec(e+fx)}}-\frac{2a\left(a^2-6b^2\right)\tan(e+fx)}{f\sqrt{d\sec(e+fx)}}+\frac{2a\left(a^2-6b^2\right)\sqrt[4]{\sec^2(e+fx)}\,E}{f\sqrt{d\sec(e}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Tan[e + f*x])^3/Sqrt[d*Sec[e + f*x]],x]
```

```
[Out] (2*a*(a^2 - 6*b^2)*EllipticE[ArcTan[Tan[e + f*x]]/2, 2]*(Sec[e + f*x]^2)^(1
/4))/(f*Sqrt[d*Sec[e + f*x]]) - (2*a*(a^2 - 6*b^2)*Tan[e + f*x])/(f*Sqrt[d*
Sec[e + f*x]]) - (2*(b - a*Tan[e + f*x])*(a + b*Tan[e + f*x])^2)/(f*Sqrt[d*
Sec[e + f*x]]) - (2*b*Sec[e + f*x]^2*(2*(3*a^2 - 2*b^2) + 3*a*b*Tan[e + f*x
]))/(3*f*Sqrt[d*Sec[e + f*x]])
```

Rule 196

```
Int[((a_) + (b_.)*(x_)^2)^(-5/4), x_Symbol] :> Simp[(2*EllipticE[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(5/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 227

```
Int[((a_) + (b_.)*(x_)^2)^(-1/4), x_Symbol] :> Simp[(2*x)/(a + b*x^2)^(1/4)
, x] - Dist[a, Int[1/(a + b*x^2)^(5/4), x], x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 739

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m - 1)*(a*e - c*d*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)), x] +
 Dist[1/((p + 1)*(-2*a*c)), Int[(d + e*x)^(m - 2)*Simp[a*e^2*(m - 1) - c*d^
2*(2*p + 3) - d*c*e*(m + 2*p + 2)*x, x]*(a + c*x^2)^(p + 1), x], x] /; Free
Q[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && I
ntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 780

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[(((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*(a + c*x^2)^(p
+ 1))/(2*c*(p + 1)*(2*p + 3)), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
```

```
Q[p, -1]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] && !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{(a+b\tan(e+fx))^3}{\sqrt{d\sec(e+fx)}}\,dx = \frac{\sqrt[4]{\sec^2(e+fx)}\ \text{Subst}\left(\int \frac{(a+x)^3}{\left(1+\frac{x^2}{b^2}\right)^{5/4}}\,dx, x, b\tan(e+fx)\right)}{bf\sqrt{d\sec(e+fx)}}$$

$$= -\frac{2(b-a\tan(e+fx))(a+b\tan(e+fx))^2}{f\sqrt{d\sec(e+fx)}} + \frac{\left(2b\sqrt[4]{\sec^2(e+fx)}\right)\text{Subst}\left(\int \frac{(a+x)\left(\frac{1}{2}\left(4-\right.\right.}{\sqrt[4]{1+}}\right.}{f\sqrt{d\sec(e+f}}$$

$$= -\frac{2(b-a\tan(e+fx))(a+b\tan(e+fx))^2}{f\sqrt{d\sec(e+fx)}} - \frac{2b\sec^2(e+fx)\left(2\left(3a^2-2b^2\right)+3ab\tan\right.}{3f\sqrt{d\sec(e+fx)}}$$

$$= -\frac{2a\left(a^2-6b^2\right)\tan(e+fx)}{f\sqrt{d\sec(e+fx)}} - \frac{2(b-a\tan(e+fx))(a+b\tan(e+fx))^2}{f\sqrt{d\sec(e+fx)}} - \frac{2b\sec^2(e+}{}$$

$$= \frac{2a\left(a^2-6b^2\right)E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt[4]{\sec^2(e+fx)}}{f\sqrt{d\sec(e+fx)}} - \frac{2a\left(a^2-6b^2\right)\tan(e+fx}{f\sqrt{d\sec(e+fx)}}$$

Mathematica [A] time = 1.92, size = 130, normalized size = 0.73

$$\frac{d(a+b\tan(e+fx))^3\left(6a\left(a^2-6b^2\right)\cos^{\frac{3}{2}}(e+fx)E\left(\frac{1}{2}(e+fx)\middle|2\right)+b\left(\left(3b^2-9a^2\right)\cos(2(e+fx))-9a^2+9ab\sin\right.\right.}{3f(d\sec(e+fx))^{3/2}(a\cos(e+fx)+b\sin(e+fx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Tan[e + f*x])^3/Sqrt[d*Sec[e + f*x]],x]
```

```
[Out] (d*(6*a*(a^2 - 6*b^2)*Cos[e + f*x]^(3/2)*EllipticE[(e + f*x)/2, 2] + b*(-9*
a^2 + 5*b^2 + (-9*a^2 + 3*b^2)*Cos[2*(e + f*x)] + 9*a*b*Sin[2*(e + f*x)]))*
(a + b*Tan[e + f*x])^3)/(3*f*(d*Sec[e + f*x])^(3/2)*(a*Cos[e + f*x] + b*Sin
[e + f*x])^3)
```

fricas [F] time = 0.77, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(b^3\tan\left(fx+e\right)^3+3\,ab^2\tan\left(fx+e\right)^2+3\,a^2b\tan\left(fx+e\right)+a^3\right)\sqrt{d\sec\left(fx+e\right)}}{d\sec\left(fx+e\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(1/2),x, algorithm="fricas")
```

```
[Out] integral((b^3*tan(f*x + e)^3 + 3*a*b^2*tan(f*x + e)^2 + 3*a^2*b*tan(f*x + e
) + a^3)*sqrt(d*sec(f*x + e))/(d*sec(f*x + e)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\tan\left(fx+e\right)+a\right)^3}{\sqrt{d\sec\left(fx+e\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((b*tan(f*x + e) + a)^3/sqrt(d*sec(f*x + e)), x)
```

maple [C] time = 1.08, size = 3065, normalized size = 17.22

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(1/2),x)
```

```
[Out] 1/6/f*(-1+cos(f*x+e))^2*(36*cos(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)
*a*b^2-72*cos(f*x+e)^3*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*a*b^2+24*cos(f*
x+e)^2*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*b^3+36*cos(f*x+e)^2*
(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*a*b^2+12*cos(f*x+e)*sin(f*x+e)*(-cos(f
*x+e)/(1+cos(f*x+e))^2)^(3/2)*b^3-72*cos(f*x+e)^4*(-cos(f*x+e)/(1+cos(f*x+e
))^2)^(3/2)*a*b^2+40*cos(f*x+e)^3*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)
^(3/2)*b^3+36*cos(f*x+e)^6*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*a*b^2+12*co
s(f*x+e)^5*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*b^3+3*cos(f*x+e)
^3*sin(f*x+e)*ln(-2*(2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)^2-co
s(f*x+e)^2-2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)+2*cos(f*x+e)-1)/sin(f*x+e
)^2)*b^3-3*cos(f*x+e)^3*sin(f*x+e)*ln(-(2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1
/2)*cos(f*x+e)^2-cos(f*x+e)^2-2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)+2*cos(
f*x+e)-1)/sin(f*x+e)^2)*b^3+72*I*cos(f*x+e)^3*sin(f*x+e)*EllipticF(I*(-1+co
s(f*x+e))/sin(f*x+e),I)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(f*x+
e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a^3-72*I*cos(f*x+e)^3*sin(f*x+
e)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(-cos(f*x+e)/(1+cos(f*x+e))^2)
^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a^3+48*I*
cos(f*x+e)^2*sin(f*x+e)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(-cos(f*x
+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x
+e)))^(1/2)*a^3-48*I*cos(f*x+e)^2*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)
^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticE
(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a^3+12*I*cos(f*x+e)*sin(f*x+e)*EllipticF(I
*(-1+cos(f*x+e))/sin(f*x+e),I)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+c
os(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a^3-12*I*cos(f*x+e)*sin
(f*x+e)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(-cos(f*x+e)/(1+cos(f*x+e
))^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a^3+
36*cos(f*x+e)^5*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*a*b^2+36*cos(f*x+e)^4*
sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*b^3+12*I*cos(f*x+e)^5*sin(f
*x+e)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(-cos(f*x+e)/(1+cos(f*x+e))
^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a^3-12
*I*cos(f*x+e)^5*sin(f*x+e)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(-cos(
f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(
f*x+e)))^(1/2)*a^3+48*I*cos(f*x+e)^4*sin(f*x+e)*EllipticF(I*(-1+cos(f*x+e))
/sin(f*x+e),I)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2
```

```
)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a^3-48*I*cos(f*x+e)^4*sin(f*x+e)*Ellipt
icE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1
/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a^3-12*cos(f*x+e)^
6*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*a^3+4*(-cos(f*x+e)/(1+cos(f*x+e))^2)
^(3/2)*b^3*sin(f*x+e)+12*cos(f*x+e)^2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*
a^3+24*cos(f*x+e)^3*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*a^3-24*cos(f*x+e)^
5*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*a^3-108*cos(f*x+e)^4*sin(f*x+e)*(-co
s(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*a^2*b-36*cos(f*x+e)^5*sin(f*x+e)*(-cos(f*x
+e)/(1+cos(f*x+e))^2)^(3/2)*a^2*b-9*cos(f*x+e)^3*sin(f*x+e)*ln(-2*(2*(-cos(
f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)^2-cos(f*x+e)^2-2*(-cos(f*x+e)/(1+
cos(f*x+e))^2)^(1/2)+2*cos(f*x+e)-1)/sin(f*x+e)^2)*a^2*b+9*cos(f*x+e)^3*sin
(f*x+e)*ln(-(2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)^2-cos(f*x+e)
^2-2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)+2*cos(f*x+e)-1)/sin(f*x+e)^2)*a^2
*b-108*cos(f*x+e)^3*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*a^2*b-3
6*cos(f*x+e)^2*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*a^2*b-72*I*c
os(f*x+e)*sin(f*x+e)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(-cos(f*x+e)
/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)
))^(1/2)*a*b^2+72*I*cos(f*x+e)*sin(f*x+e)*EllipticE(I*(-1+cos(f*x+e))/sin(f
*x+e),I)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos
(f*x+e)/(1+cos(f*x+e)))^(1/2)*a*b^2-72*I*cos(f*x+e)^5*sin(f*x+e)*EllipticF(
I*(-1+cos(f*x+e))/sin(f*x+e),I)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+
cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a*b^2+72*I*cos(f*x+e)^
5*sin(f*x+e)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(-cos(f*x+e)/(1+cos(
f*x+e))^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)
*a*b^2-288*I*cos(f*x+e)^4*sin(f*x+e)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e)
,I)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+
e)/(1+cos(f*x+e)))^(1/2)*a*b^2+288*I*cos(f*x+e)^4*sin(f*x+e)*EllipticE(I*(-
1+cos(f*x+e))/sin(f*x+e),I)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(
f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a*b^2-432*I*cos(f*x+e)^3*s
in(f*x+e)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(-cos(f*x+e)/(1+cos(f*x
+e))^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a*
b^2+432*I*cos(f*x+e)^3*sin(f*x+e)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)
*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/
(1+cos(f*x+e)))^(1/2)*a*b^2-288*I*cos(f*x+e)^2*sin(f*x+e)*EllipticF(I*(-1+c
os(f*x+e))/sin(f*x+e),I)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(3/2)*(1/(1+cos(f*x
+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a*b^2+288*I*cos(f*x+e)^2*sin(
f*x+e)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(-cos(f*x+e)/(1+cos(f*x+e)
)^2)^(3/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a*b^2
)/(1+cos(f*x+e))/cos(f*x+e)^2/sin(f*x+e)^5/(d/cos(f*x+e))^(1/2)/(-cos(f*x+e
)/(1+cos(f*x+e))^2)^(3/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\tan\left(fx+e\right)+a\right)^3}{\sqrt{d\sec\left(fx+e\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(1/2),x, algorithm="maxima")
[Out] integrate((b*tan(f*x + e) + a)^3/sqrt(d*sec(f*x + e)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\tan\left(e+f\,x\right)\right)^3}{\sqrt{\frac{d}{\cos\left(e+f\,x\right)}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(e + f*x))^3/(d/cos(e + f*x))^(1/2),x)
[Out] int((a + b*tan(e + f*x))^3/(d/cos(e + f*x))^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b\tan\left(e + fx\right)\right)^3}{\sqrt{d\sec\left(e + fx\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))**3/(d*sec(f*x+e))**(1/2),x)
[Out] Integral((a + b*tan(e + f*x))**3/sqrt(d*sec(e + f*x)), x)
```

3.598 $\int \frac{(a+b\tan(e+fx))^3}{(d\sec(e+fx))^{3/2}}\,dx$

Optimal. Leaf size=146

$$-\frac{2b\sec^2(e+fx)\left(2\left(a^2-2b^2\right)+ab\tan(e+fx)\right)}{3f(d\sec(e+fx))^{3/2}}+\frac{2a\left(a^2+6b^2\right)\sec^2(e+fx)^{3/4}F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)}{3f(d\sec(e+fx))^{3/2}}-\frac{2(b\cdots}{}$$

```
[Out] 2/3*a*(a^2+6*b^2)*(cos(1/2*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arctan(tan(
f*x+e)))*EllipticF(sin(1/2*arctan(tan(f*x+e))),2^(1/2))*(sec(f*x+e)^2)^(3/4
)/f/(d*sec(f*x+e))^(3/2)-2/3*(b-a*tan(f*x+e))*(a+b*tan(f*x+e))^2/f/(d*sec(f
*x+e))^(3/2)-2/3*b*sec(f*x+e)^2*(2*a^2-4*b^2+a*b*tan(f*x+e))/f/(d*sec(f*x+e
))^(3/2)
```

Rubi [A] time = 0.12, antiderivative size = 146, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.160$, Rules used = {3512, 739, 780, 231}

$$-\frac{2b\sec^2(e+fx)\left(2\left(a^2-2b^2\right)+ab\tan(e+fx)\right)}{3f(d\sec(e+fx))^{3/2}}+\frac{2a\left(a^2+6b^2\right)\sec^2(e+fx)^{3/4}F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)}{3f(d\sec(e+fx))^{3/2}}-\frac{2(b\cdots}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Tan[e + f*x])^3/(d*Sec[e + f*x])^(3/2),x]
```

```
[Out] (2*a*(a^2 + 6*b^2)*EllipticF[ArcTan[Tan[e + f*x]]/2, 2]*(Sec[e + f*x]^2)^(3
/4))/(3*f*(d*Sec[e + f*x])^(3/2)) - (2*(b - a*Tan[e + f*x])*(a + b*Tan[e +
f*x])^2)/(3*f*(d*Sec[e + f*x])^(3/2)) - (2*b*Sec[e + f*x]^2*(2*(a^2 - 2*b^2
) + a*b*Tan[e + f*x]))/(3*f*(d*Sec[e + f*x])^(3/2))
```

Rule 231

```
Int[((a_) + (b_.)*(x_)^2)^(-3/4), x_Symbol] :> Simp[(2*EllipticF[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(3/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 739

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m - 1)*(a*e - c*d*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)), x] +
 Dist[1/((p + 1)*(-2*a*c)), Int[(d + e*x)^(m - 2)*Simp[a*e^2*(m - 1) - c*d^
2*(2*p + 3) - d*c*e*(m + 2*p + 2)*x, x]*(a + c*x^2)^(p + 1), x], x] /; Free
Q[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && I
ntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 780

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[(((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*(a + c*x^2)^(p
+ 1))/(2*c*(p + 1)*(2*p + 3)), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
```

```
}, x] && NeQ[a^2 + b^2, 0] && !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{(a+b\tan(e+fx))^3}{(d\sec(e+fx))^{3/2}}\,dx = \frac{\sec^2(e+fx)^{3/4}\,\text{Subst}\left(\int \frac{(a+x)^3}{\left(1+\frac{x^2}{b^2}\right)^{7/4}}\,dx, x, b\tan(e+fx)\right)}{bf(d\sec(e+fx))^{3/2}}$$

$$= -\frac{2(b-a\tan(e+fx))(a+b\tan(e+fx))^2}{3f(d\sec(e+fx))^{3/2}} + \frac{\left(2b\sec^2(e+fx)^{3/4}\right)\text{Subst}\left(\int \frac{(a+x)\left(\frac{1}{2}\right.}{\left(1\right.}\right.}{3f(d\sec(e+\right.}$$

$$= -\frac{2(b-a\tan(e+fx))(a+b\tan(e+fx))^2}{3f(d\sec(e+fx))^{3/2}} - \frac{2b\sec^2(e+fx)\left(2\left(a^2-2b^2\right)+ab\,\text{ta}\right.}{3f(d\sec(e+fx))^{3/2}}$$

$$= \frac{2a\left(a^2+6b^2\right)F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sec^2(e+fx)^{3/4}}{3f(d\sec(e+fx))^{3/2}} - \frac{2(b-a\tan(e+fx))(\right.}{3f(d\sec(e\right.}$$

Mathematica [A] time = 1.32, size = 117, normalized size = 0.80

$$\frac{\sec^2(e+fx)\left(a^3\sin(2(e+fx))+\left(b^3-3a^2b\right)\cos(2(e+fx))+2a\left(a^2+6b^2\right)\sqrt{\cos(e+fx)}\,F\left(\frac{1}{2}(e+fx)\middle|2\right)-3\right.}{3f(d\sec(e+fx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Tan[e + f*x])^3/(d*Sec[e + f*x])^(3/2),x]
```

```
[Out] (Sec[e + f*x]^2*(-3*a^2*b + 7*b^3 + (-3*a^2*b + b^3)*Cos[2*(e + f*x)] + 2*a
*(a^2 + 6*b^2)*Sqrt[Cos[e + f*x]]*EllipticF[(e + f*x)/2, 2] + a^3*Sin[2*(e
+ f*x)] - 3*a*b^2*Sin[2*(e + f*x)]))/(3*f*(d*Sec[e + f*x])^(3/2))
```

fricas [F] time = 0.57, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(b^3\tan\left(fx+e\right)^3+3\,ab^2\tan\left(fx+e\right)^2+3\,a^2b\tan\left(fx+e\right)+a^3\right)\sqrt{d\sec\left(fx+e\right)}}{d^2\sec\left(fx+e\right)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(3/2),x, algorithm="fricas")
```

```
[Out] integral((b^3*tan(f*x + e)^3 + 3*a*b^2*tan(f*x + e)^2 + 3*a^2*b*tan(f*x + e
) + a^3)*sqrt(d*sec(f*x + e))/(d^2*sec(f*x + e)^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\tan\left(fx+e\right)+a\right)^3}{\left(d\sec\left(fx+e\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(3/2),x, algorithm="giac")
[Out] integrate((b*tan(f*x + e) + a)^3/(d*sec(f*x + e))^(3/2), x)
```

maple [C] time = 1.00, size = 342, normalized size = 2.34

$$\frac{\frac{2i\sqrt{\frac{1}{1+\cos(fx+e)}}\sqrt{\frac{\cos(fx+e)}{1+\cos(fx+e)}}\,\mathrm{EllipticF}\left(\frac{i(-1+\cos(fx+e))}{\sin(fx+e)},i\right)\cos(fx+e)a^3}{3}+4i\sqrt{\frac{1}{1+\cos(fx+e)}}\sqrt{\frac{\cos(fx+e)}{1+\cos(fx+e)}}\,\mathrm{EllipticF}\left(\frac{i(-1+\cos(fx+e))}{\sin(fx+e)},\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(3/2),x)
[Out] 2/3/f*(I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*Ellipti
cF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*cos(f*x+e)*a^3+6*I*(1/(1+cos(f*x+e)))^(1
/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e
),I)*cos(f*x+e)*a*b^2+I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e))
)^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a^3+6*I*(1/(1+cos(f*x+e))
)^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f
*x+e),I)*a*b^2-3*a^2*cos(f*x+e)^2*b+b^3*cos(f*x+e)^2+cos(f*x+e)*sin(f*x+e)*
a^3-3*cos(f*x+e)*sin(f*x+e)*a*b^2+3*b^3)/(d/cos(f*x+e))^(3/2)/cos(f*x+e)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b\tan(fx+e)+a)^3}{(d\sec(fx+e))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(3/2),x, algorithm="maxima")
[Out] integrate((b*tan(f*x + e) + a)^3/(d*sec(f*x + e))^(3/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\tan(e+fx))^3}{\left(\frac{d}{\cos(e+fx)}\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(e + f*x))^3/(d/cos(e + f*x))^(3/2),x)
[Out] int((a + b*tan(e + f*x))^3/(d/cos(e + f*x))^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a+b\tan(e+fx))^3}{(d\sec(e+fx))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))**3/(d*sec(f*x+e))**(3/2),x)
[Out] Integral((a + b*tan(e + f*x))**3/(d*sec(e + f*x))**(3/2), x)
```

3.599 $\int \frac{(a+b\tan(e+fx))^3}{(d\sec(e+fx))^{5/2}}\,dx$

Optimal. Leaf size=204

$$-\frac{6a\left(a^2+2b^2\right)\tan(e+fx)}{5d^2f\sqrt{d\sec(e+fx)}}-\frac{2\left(2b\left(a^2+2b^2\right)-a\left(3a^2+5b^2\right)\tan(e+fx)\right)}{5d^2f\sqrt{d\sec(e+fx)}}+\frac{6a\left(a^2+2b^2\right)\sqrt[4]{\sec^2(e+fx)}\,E\left(\frac{1}{2}\right.}{5d^2f\sqrt{d\sec(e+}}$$

```
[Out] 6/5*a*(a^2+2*b^2)*(cos(1/2*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arctan(tan(
f*x+e)))*EllipticE(sin(1/2*arctan(tan(f*x+e))),2^(1/2))*(sec(f*x+e)^2)^(1/4
)/d^2/f/(d*sec(f*x+e))^(1/2)-6/5*a*(a^2+2*b^2)*tan(f*x+e)/d^2/f/(d*sec(f*x+
e))^(1/2)-2/5*cos(f*x+e)^2*(b-a*tan(f*x+e))*(a+b*tan(f*x+e))^2/d^2/f/(d*sec
(f*x+e))^(1/2)-2/5*(2*b*(a^2+2*b^2)-a*(3*a^2+5*b^2)*tan(f*x+e))/d^2/f/(d*se
c(f*x+e))^(1/2)
```

Rubi [A] time = 0.16, antiderivative size = 204, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.200$, Rules used = {3512, 739, 778, 227, 196}

$$-\frac{6a\left(a^2+2b^2\right)\tan(e+fx)}{5d^2f\sqrt{d\sec(e+fx)}}-\frac{2\left(2b\left(a^2+2b^2\right)-a\left(3a^2+5b^2\right)\tan(e+fx)\right)}{5d^2f\sqrt{d\sec(e+fx)}}+\frac{6a\left(a^2+2b^2\right)\sqrt[4]{\sec^2(e+fx)}\,E\left(\frac{1}{2}\right.}{5d^2f\sqrt{d\sec(e+}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Tan[e + f*x])^3/(d*Sec[e + f*x])^(5/2),x]
```

```
[Out] (6*a*(a^2 + 2*b^2)*EllipticE[ArcTan[Tan[e + f*x]]/2, 2]*(Sec[e + f*x]^2)^(1
/4))/(5*d^2*f*Sqrt[d*Sec[e + f*x]]) - (6*a*(a^2 + 2*b^2)*Tan[e + f*x])/(5*d
^2*f*Sqrt[d*Sec[e + f*x]]) - (2*Cos[e + f*x]^2*(b - a*Tan[e + f*x])*(a + b*
Tan[e + f*x])^2)/(5*d^2*f*Sqrt[d*Sec[e + f*x]]) - (2*(2*b*(a^2 + 2*b^2) - a
*(3*a^2 + 5*b^2)*Tan[e + f*x]))/(5*d^2*f*Sqrt[d*Sec[e + f*x]])
```

Rule 196

```
Int[((a_) + (b_.)*(x_)^2)^(-5/4), x_Symbol] :> Simp[(2*EllipticE[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(5/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 227

```
Int[((a_) + (b_.)*(x_)^2)^(-1/4), x_Symbol] :> Simp[(2*x)/(a + b*x^2)^(1/4)
, x] - Dist[a, Int[1/(a + b*x^2)^(5/4), x], x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 739

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m - 1)*(a*e - c*d*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)), x] +
 Dist[1/((p + 1)*(-2*a*c)), Int[(d + e*x)^(m - 2)*Simp[a*e^2*(m - 1) - c*d^
2*(2*p + 3) - d*c*e*(m + 2*p + 2)*x, x]*(a + c*x^2)^(p + 1), x], x] /; Free
Q[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && I
ntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 778

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[((a*(e*f + d*g) - (c*d*f - a*e*g)*x)*(a + c*x^2)^(p + 1))/
(2*a*c*(p + 1)), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(2*a*c*(p + 1)), Int[(
```

```
a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, f, g}, x] && LtQ[p, -1]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] && !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{(a+b\tan(e+fx))^3}{(d\sec(e+fx))^{5/2}}\,dx = \frac{\sqrt[4]{\sec^2(e+fx)}\,\text{Subst}\left(\int \frac{(a+x)^3}{\left(1+\frac{x^2}{b^2}\right)^{9/4}}\,dx, x, b\tan(e+fx)\right)}{bd^2f\sqrt{d\sec(e+fx)}}$$

$$= -\frac{2\cos^2(e+fx)(b-a\tan(e+fx))(a+b\tan(e+fx))^2}{5d^2f\sqrt{d\sec(e+fx)}} + \frac{\left(2b\sqrt[4]{\sec^2(e+fx)}\right)\text{Subst}}{5d}$$

$$= -\frac{2\cos^2(e+fx)(b-a\tan(e+fx))(a+b\tan(e+fx))^2}{5d^2f\sqrt{d\sec(e+fx)}} - \frac{2\left(2b\left(a^2+2b^2\right)-a\left(3a^2+\right.\right.}{5d^2f\sqrt{d\sec(e}}$$

$$= -\frac{6a\left(a^2+2b^2\right)\tan(e+fx)}{5d^2f\sqrt{d\sec(e+fx)}} - \frac{2\cos^2(e+fx)(b-a\tan(e+fx))(a+b\tan(e+fx))^2}{5d^2f\sqrt{d\sec(e+fx)}}$$

$$= \frac{6a\left(a^2+2b^2\right)E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt[4]{\sec^2(e+fx)}}{5d^2f\sqrt{d\sec(e+fx)}} - \frac{6a\left(a^2+2b^2\right)\tan(e+fx}{5d^2f\sqrt{d\sec(e+fx)}}$$

Mathematica [A] time = 1.45, size = 150, normalized size = 0.74

$$\frac{\sqrt{d\sec(e+fx)}\left(a^3\sin(e+fx)+a^3\sin(3(e+fx))-b\left(9a^2+17b^2\right)\cos(e+fx)+12a\left(a^2+2b^2\right)\sqrt{\cos(e+fx)}\,E\right.}{10d^3f}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Tan[e + f*x])^3/(d*Sec[e + f*x])^(5/2),x]
```

```
[Out] (Sqrt[d*Sec[e + f*x]]*(-(b*(9*a^2 + 17*b^2)*Cos[e + f*x]) - 3*a^2*b*Cos[3*(
e + f*x)] + b^3*Cos[3*(e + f*x)] + 12*a*(a^2 + 2*b^2)*Sqrt[Cos[e + f*x]]*El
lipticE[(e + f*x)/2, 2] + a^3*Sin[e + f*x] - 3*a*b^2*Sin[e + f*x] + a^3*Sin
[3*(e + f*x)] - 3*a*b^2*Sin[3*(e + f*x)]))/(10*d^3*f)
```

fricas [F] time = 0.65, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(b^3\tan\left(fx+e\right)^3+3\,ab^2\tan\left(fx+e\right)^2+3\,a^2b\tan\left(fx+e\right)+a^3\right)\sqrt{d\sec\left(fx+e\right)}}{d^3\sec\left(fx+e\right)^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(5/2),x, algorithm="fricas")
```

```
[Out] integral((b^3*tan(f*x + e)^3 + 3*a*b^2*tan(f*x + e)^2 + 3*a^2*b*tan(f*x + e
) + a^3)*sqrt(d*sec(f*x + e))/(d^3*sec(f*x + e)^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\tan\left(fx+e\right)+a\right)^{3}}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*tan(f*x + e) + a)^3/(d*sec(f*x + e))^(5/2), x)
```

maple [C] time = 0.97, size = 1923, normalized size = 9.43

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(5/2),x)
```

```
[Out] 1/10/f*(1+cos(f*x+e))^3*(-1+cos(f*x+e))^2*(-12*(-cos(f*x+e)/(1+cos(f*x+e))^
2)^(1/2)*cos(f*x+e)*a^3+12*I*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*(1/(1+cos
(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticE(I*(-1+cos(f*x+e
))/sin(f*x+e),I)*a^3*sin(f*x+e)-12*I*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*(
1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+c
os(f*x+e))/sin(f*x+e),I)*a^3*sin(f*x+e)+36*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(
1/2)*cos(f*x+e)^3*a*b^2+20*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)^
2*sin(f*x+e)*b^3+12*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)^2*a*b^2
+20*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)*sin(f*x+e)*b^3-24*(-cos
(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)*a*b^2-12*(-cos(f*x+e)/(1+cos(f*x
+e))^2)^(1/2)*cos(f*x+e)^5*a*b^2-4*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos
(f*x+e)^4*sin(f*x+e)*b^3-12*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)
^4*a*b^2-4*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)^3*sin(f*x+e)*b^3
-5*cos(f*x+e)*ln(-2*(2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)^2-co
s(f*x+e)^2-2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)+2*cos(f*x+e)-1)/sin(f*x+e
)^2)*b^3*sin(f*x+e)+5*cos(f*x+e)*ln(-(2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2
)*cos(f*x+e)^2-cos(f*x+e)^2-2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)+2*cos(f*
x+e)-1)/sin(f*x+e)^2)*b^3*sin(f*x+e)+4*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)
*cos(f*x+e)^4*a^3+8*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)^3*a^3-4
*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)^2*a^3+12*I*EllipticE(I*(-1
+cos(f*x+e))/sin(f*x+e),I)*cos(f*x+e)^2*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+
e))^2)^(1/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a^3
-12*I*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*cos(f*x+e)^2*sin(f*x+e)*(-c
os(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+c
os(f*x+e)))^(1/2)*a^3+24*I*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*cos(f*
x+e)*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*(1/(1+cos(f*x+e)))^(1/
2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a^3-24*I*EllipticF(I*(-1+cos(f*x+e))/s
in(f*x+e),I)*cos(f*x+e)*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*(1/
(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a^3+24*I*(-cos(f*x+
e)/(1+cos(f*x+e))^2)^(1/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+
e)))^(1/2)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a*b^2*sin(f*x+e)-24*I*
(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(
1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a*b^2*sin(f*
x+e)+4*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)^5*a^3+12*(-cos(f*x+e
```

```
)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)^4*sin(f*x+e)*a^2*b+12*(-cos(f*x+e)/(1+
cos(f*x+e))^2)^(1/2)*cos(f*x+e)^3*sin(f*x+e)*a^2*b+24*I*(-cos(f*x+e)/(1+cos
(f*x+e))^2)^(1/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2
)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*cos(f*x+e)^2*sin(f*x+e)*a*b^2-2
4*I*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+
e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*cos(f*x+
e)^2*sin(f*x+e)*a*b^2+48*I*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*cos(f*
x+e)*sin(f*x+e)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*(1/(1+cos(f*x+e)))^(1/
2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a*b^2-48*I*(-cos(f*x+e)/(1+cos(f*x+e))
^2)^(1/2)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*Ellipt
icF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*cos(f*x+e)*sin(f*x+e)*a*b^2)*cos(f*x+e)
*(d/cos(f*x+e))^(5/2)*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)/d^5/sin(f*x+e)^5
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\tan\left(fx+e\right)+a\right)^{3}}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(5/2),x, algorithm="maxima")
[Out] integrate((b*tan(f*x + e) + a)^3/(d*sec(f*x + e))^(5/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a+b\tan\left(e+f\,x\right)\right)^3}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(e + f*x))^3/(d/cos(e + f*x))^(5/2),x)
[Out] int((a + b*tan(e + f*x))^3/(d/cos(e + f*x))^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\tan\left(e+fx\right)\right)^{3}}{\left(d\sec\left(e+fx\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))**3/(d*sec(f*x+e))**(5/2),x)
[Out] Integral((a + b*tan(e + f*x))**3/(d*sec(e + f*x))**(5/2), x)
```

3.600 $\int \frac{(a+b\tan(e+fx))^3}{(d\sec(e+fx))^{7/2}}\,dx$

Optimal. Leaf size=170

$$-\frac{2\left(2b\left(3a^2+2b^2\right)-a\left(5a^2+3b^2\right)\tan(e+fx)\right)}{21d^2f(d\sec(e+fx))^{3/2}}+\frac{2a\left(5a^2+6b^2\right)\sec^2(e+fx)^{3/4}F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)}{21d^2f(d\sec(e+fx))^{3/2}}-\frac{2}{}$$

```
[Out] 2/21*a*(5*a^2+6*b^2)*(cos(1/2*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arctan(t
an(f*x+e)))*EllipticF(sin(1/2*arctan(tan(f*x+e))),2^(1/2))*(sec(f*x+e)^2)^(
3/4)/d^2/f/(d*sec(f*x+e))^(3/2)-2/7*cos(f*x+e)^2*(b-a*tan(f*x+e))*(a+b*tan(
f*x+e))^2/d^2/f/(d*sec(f*x+e))^(3/2)-2/21*(2*b*(3*a^2+2*b^2)-a*(5*a^2+3*b^2
)*tan(f*x+e))/d^2/f/(d*sec(f*x+e))^(3/2)
```

Rubi [A] time = 0.14, antiderivative size = 170, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {3512, 739, 778, 231}

$$-\frac{2\left(2b\left(3a^2+2b^2\right)-a\left(5a^2+3b^2\right)\tan(e+fx)\right)}{21d^2f(d\sec(e+fx))^{3/2}}+\frac{2a\left(5a^2+6b^2\right)\sec^2(e+fx)^{3/4}F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)}{21d^2f(d\sec(e+fx))^{3/2}}-\frac{2}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Tan[e + f*x])^3/(d*Sec[e + f*x])^(7/2),x]
```

```
[Out] (2*a*(5*a^2 + 6*b^2)*EllipticF[ArcTan[Tan[e + f*x]]/2, 2]*(Sec[e + f*x]^2)^
(3/4))/(21*d^2*f*(d*Sec[e + f*x])^(3/2)) - (2*Cos[e + f*x]^2*(b - a*Tan[e +
 f*x])*(a + b*Tan[e + f*x])^2)/(7*d^2*f*(d*Sec[e + f*x])^(3/2)) - (2*(2*b*(
3*a^2 + 2*b^2) - a*(5*a^2 + 3*b^2)*Tan[e + f*x]))/(21*d^2*f*(d*Sec[e + f*x]
)^(3/2))
```

Rule 231

```
Int[((a_) + (b_.)*(x_)^2)^(-3/4), x_Symbol] :> Simp[(2*EllipticF[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(3/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 739

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m - 1)*(a*e - c*d*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)), x] +
 Dist[1/((p + 1)*(-2*a*c)), Int[(d + e*x)^(m - 2)*Simp[a*e^2*(m - 1) - c*d^
2*(2*p + 3) - d*c*e*(m + 2*p + 2)*x, x]*(a + c*x^2)^(p + 1), x], x] /; Free
Q[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && I
ntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 778

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[((a*(e*f + d*g) - (c*d*f - a*e*g)*x)*(a + c*x^2)^(p + 1))/
(2*a*c*(p + 1)), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(2*a*c*(p + 1)), Int[(
a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, f, g}, x] && LtQ[p, -1]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
```

```
}, x] && NeQ[a^2 + b^2, 0] && !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{(a+b\tan(e+fx))^3}{(d\sec(e+fx))^{7/2}}\,dx = \frac{\sec^2(e+fx)^{3/4}\,\text{Subst}\left(\int \frac{(a+x)^3}{\left(1+\frac{x^2}{b^2}\right)^{11/4}}\,dx, x, b\tan(e+fx)\right)}{bd^2f(d\sec(e+fx))^{3/2}}$$

$$= -\frac{2\cos^2(e+fx)(b-a\tan(e+fx))(a+b\tan(e+fx))^2}{7d^2f(d\sec(e+fx))^{3/2}} + \frac{\left(2b\sec^2(e+fx)^{3/4}\right)\text{Subst}}{7d^2}$$

$$= -\frac{2\cos^2(e+fx)(b-a\tan(e+fx))(a+b\tan(e+fx))^2}{7d^2f(d\sec(e+fx))^{3/2}} - \frac{2\left(2b\left(3a^2+2b^2\right)-a\left(5a^2\right.\right.}{21d^2f(d\sec(e}$$

$$= \frac{2a\left(5a^2+6b^2\right)F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sec^2(e+fx)^{3/4}}{21d^2f(d\sec(e+fx))^{3/2}} - \frac{2\cos^2(e+fx)(b-a\tan}{7d^2f(d}$$

Mathematica [A] time = 2.60, size = 150, normalized size = 0.88

$$\frac{\sqrt{\cos(e+fx)}\sqrt{d\sec(e+fx)}\left(4\left(5a^3+6ab^2\right)F\left(\frac{1}{2}(e+fx)\middle|2\right)+\sqrt{\cos(e+fx)}\left(\left(3b^3-9a^2b\right)\cos(3(e+fx))-b\left(\right.\right.\right.}{42d^4f}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Tan[e + f*x])^3/(d*Sec[e + f*x])^(7/2),x]
```

```
[Out] (Sqrt[Cos[e + f*x]]*Sqrt[d*Sec[e + f*x]]*(4*(5*a^3 + 6*a*b^2)*EllipticF[(e
+ f*x)/2, 2] + Sqrt[Cos[e + f*x]]*(-(b*(27*a^2 + 19*b^2)*Cos[e + f*x]) + (-
9*a^2*b + 3*b^3)*Cos[3*(e + f*x)] + 2*a*(13*a^2 + 3*b^2 + 3*(a^2 - 3*b^2)*C
os[2*(e + f*x)])*Sin[e + f*x])))/(42*d^4*f)
```

fricas [F] time = 2.38, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(b^3\tan\left(fx+e\right)^3+3\,ab^2\tan\left(fx+e\right)^2+3\,a^2b\tan\left(fx+e\right)+a^3\right)\sqrt{d\sec\left(fx+e\right)}}{d^4\sec\left(fx+e\right)^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(7/2),x, algorithm="fricas")
```

```
[Out] integral((b^3*tan(f*x + e)^3 + 3*a*b^2*tan(f*x + e)^2 + 3*a^2*b*tan(f*x + e
) + a^3)*sqrt(d*sec(f*x + e))/(d^4*sec(f*x + e)^4), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\tan\left(fx+e\right)+a\right)^3}{\left(d\sec\left(fx+e\right)\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(7/2),x, algorithm="giac")
```

```
[Out] integrate((b*tan(f*x + e) + a)^3/(d*sec(f*x + e))^(7/2), x)
```

maple [C] time = 0.98, size = 391, normalized size = 2.30

$$-\frac{2\left(-5i\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\,\sqrt{\frac{\cos\left(fx+e\right)}{1+\cos\left(fx+e\right)}}\,\mathrm{EllipticF}\left(\frac{i\left(-1+\cos\left(fx+e\right)\right)}{\sin\left(fx+e\right)},i\right)\cos\left(fx+e\right)a^{3}-6i\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\,\sqrt{\frac{\cos\left(fx+e\right)}{1+\cos\left(fx+e\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(7/2),x)
```

```
[Out] -2/21/f*(-5*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*El
lipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*cos(f*x+e)*a^3-6*I*cos(f*x+e)*Ellip
ticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(
1+cos(f*x+e)))^(1/2)*a*b^2+9*cos(f*x+e)^4*a^2*b-3*cos(f*x+e)^4*b^3-3*cos(f*
x+e)^3*sin(f*x+e)*a^3+9*cos(f*x+e)^3*sin(f*x+e)*a*b^2-5*I*(1/(1+cos(f*x+e))
)^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f
*x+e),I)*a^3-6*I*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(1/(1+cos(f*x+e)
))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a*b^2+7*b^3*cos(f*x+e)^2-5*cos(f
*x+e)*sin(f*x+e)*a^3-6*cos(f*x+e)*sin(f*x+e)*a*b^2)/cos(f*x+e)^4/(d/cos(f*x
+e))^(7/2)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(7/2),x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(a+b\,\tan\left(e+f\,x\right)\right)}^3}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{7/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(e + f*x))^3/(d/cos(e + f*x))^(7/2),x)
```

```
[Out] int((a + b*tan(e + f*x))^3/(d/cos(e + f*x))^(7/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))**3/(d*sec(f*x+e))**(7/2),x)
```

```
[Out] Timed out
```

3.601 $\int \frac{(a+b\tan(e+fx))^3}{(d\sec(e+fx))^{9/2}}\,dx$

Optimal. Leaf size=176

$$-\frac{2\cos^2(e+fx)\left(2b\left(5a^2+2b^2\right)-a\left(7a^2+b^2\right)\tan(e+fx)\right)}{45d^4f\sqrt{d\sec(e+fx)}}+\frac{2a\left(7a^2+6b^2\right)\sqrt[4]{\sec^2(e+fx)}\,E\left(\frac{1}{2}\tan^{-1}(\tan(e+f$$

```
[Out] 2/15*a*(7*a^2+6*b^2)*(cos(1/2*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arctan(t
an(f*x+e)))*EllipticE(sin(1/2*arctan(tan(f*x+e))),2^(1/2))*(sec(f*x+e)^2)^(
1/4)/d^4/f/(d*sec(f*x+e))^(1/2)-2/9*cos(f*x+e)^4*(b-a*tan(f*x+e))*(a+b*tan(
f*x+e))^2/d^4/f/(d*sec(f*x+e))^(1/2)-2/45*cos(f*x+e)^2*(2*b*(5*a^2+2*b^2)-a
*(7*a^2+b^2)*tan(f*x+e))/d^4/f/(d*sec(f*x+e))^(1/2)
```

Rubi [A] time = 0.14, antiderivative size = 176, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {3512, 739, 778, 196}

$$-\frac{2\cos^2(e+fx)\left(2b\left(5a^2+2b^2\right)-a\left(7a^2+b^2\right)\tan(e+fx)\right)}{45d^4f\sqrt{d\sec(e+fx)}}+\frac{2a\left(7a^2+6b^2\right)\sqrt[4]{\sec^2(e+fx)}\,E\left(\frac{1}{2}\tan^{-1}(\tan(e+f$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Tan[e + f*x])^3/(d*Sec[e + f*x])^(9/2),x]
```

```
[Out] (2*a*(7*a^2 + 6*b^2)*EllipticE[ArcTan[Tan[e + f*x]]/2, 2]*(Sec[e + f*x]^2)^
(1/4))/(15*d^4*f*Sqrt[d*Sec[e + f*x]]) - (2*Cos[e + f*x]^4*(b - a*Tan[e + f
*x])*(a + b*Tan[e + f*x])^2)/(9*d^4*f*Sqrt[d*Sec[e + f*x]]) - (2*Cos[e + f*
x]^2*(2*b*(5*a^2 + 2*b^2) - a*(7*a^2 + b^2)*Tan[e + f*x]))/(45*d^4*f*Sqrt[d
*Sec[e + f*x]])
```

Rule 196

```
Int[((a_) + (b_.)*(x_)^2)^(-5/4), x_Symbol] :> Simp[(2*EllipticE[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(5/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 739

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m - 1)*(a*e - c*d*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)), x] +
 Dist[1/((p + 1)*(-2*a*c)), Int[(d + e*x)^(m - 2)*Simp[a*e^2*(m - 1) - c*d^
2*(2*p + 3) - d*c*e*(m + 2*p + 2)*x, x]*(a + c*x^2)^(p + 1), x], x] /; Free
Q[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && I
ntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 778

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[((a*(e*f + d*g) - (c*d*f - a*e*g)*x)*(a + c*x^2)^(p + 1))/
(2*a*c*(p + 1)), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(2*a*c*(p + 1)), Int[(
a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, f, g}, x] && LtQ[p, -1]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
```

```
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{(a+b\tan(e+fx))^3}{(d\sec(e+fx))^{9/2}}\,dx = \frac{\sqrt[4]{\sec^2(e+fx)}\,\text{Subst}\left(\int \frac{(a+x)^3}{\left(1+\frac{x^2}{b^2}\right)^{13/4}}\,dx, x, b\tan(e+fx)\right)}{bd^4f\sqrt{d\sec(e+fx)}}$$

$$= -\frac{2\cos^4(e+fx)(b-a\tan(e+fx))(a+b\tan(e+fx))^2}{9d^4f\sqrt{d\sec(e+fx)}} + \frac{\left(2b\sqrt[4]{\sec^2(e+fx)}\right)\text{Su}\ldots}{\ldots}$$

$$= -\frac{2\cos^4(e+fx)(b-a\tan(e+fx))(a+b\tan(e+fx))^2}{9d^4f\sqrt{d\sec(e+fx)}} - \frac{2\cos^2(e+fx)\left(2b\left(5a^2\ldots\right.\right.}{45d^4\ldots}$$

$$= \frac{2a\left(7a^2+6b^2\right)E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt[4]{\sec^2(e+fx)}}{15d^4f\sqrt{d\sec(e+fx)}} - \frac{2\cos^4(e+fx)(b-a\ldots}{9d^4\ldots}$$

Mathematica [B] time = 6.40, size = 372, normalized size = 2.11

$$\frac{\sec^2(e+fx)(a+b\tan(e+fx))^3\left(\frac{1}{180}a\left(19a^2-3b^2\right)\sin(e+fx)+\frac{1}{360}a\left(43a^2-21b^2\right)\sin(3(e+fx))+\frac{1}{72}a\left(a^2\ldots\right.\right.}{f(d\sec(e+fx))^{9/2}(\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Tan[e + f*x])^3/(d*Sec[e + f*x])^(9/2),x]
```

```
[Out] (Sec[e + f*x]^(3/2)*((2*(56*a^3 + 48*a*b^2)*EllipticE[(e + f*x)/2, 2])/(Sqr
t[Cos[e + f*x]]*Sqrt[Sec[e + f*x]]) - (2*(15*a^2*b + 7*b^3)*Sin[e + f*x]^2)
/(Sqrt[1 - Cos[e + f*x]^2]*Sqrt[Sec[e + f*x]]*Sqrt[Cos[e + f*x]^2*(-1 + Sec
[e + f*x]^2)]))*(a + b*Tan[e + f*x])^3)/(120*f*(d*Sec[e + f*x])^(9/2)*(a*Co
s[e + f*x] + b*Sin[e + f*x])^3) + (Sec[e + f*x]^2*(-1/90*(b*(15*a^2 + 4*b^2
)*Cos[e + f*x]) - (b*(75*a^2 + 11*b^2)*Cos[3*(e + f*x)])/360 - (b*(3*a^2 -
b^2)*Cos[5*(e + f*x)])/72 + (a*(19*a^2 - 3*b^2)*Sin[e + f*x])/180 + (a*(43*
a^2 - 21*b^2)*Sin[3*(e + f*x)])/360 + (a*(a^2 - 3*b^2)*Sin[5*(e + f*x)])/72
)*(a + b*Tan[e + f*x])^3)/(f*(d*Sec[e + f*x])^(9/2)*(a*Cos[e + f*x] + b*Sin
[e + f*x])^3)
```

fricas [F] time = 0.77, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(b^3\tan\left(fx+e\right)^3+3\,ab^2\tan\left(fx+e\right)^2+3\,a^2b\tan\left(fx+e\right)+a^3\right)\sqrt{d\sec\left(fx+e\right)}}{d^5\sec\left(fx+e\right)^5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(9/2),x, algorithm="fricas")
```

```
[Out] integral((b^3*tan(f*x + e)^3 + 3*a*b^2*tan(f*x + e)^2 + 3*a^2*b*tan(f*x + e
) + a^3)*sqrt(d*sec(f*x + e))/(d^5*sec(f*x + e)^5), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\tan\left(fx+e\right)+a\right)^3}{\left(d\sec\left(fx+e\right)\right)^{\frac{9}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(9/2),x, algorithm="giac")
[Out] integrate((b*tan(f*x + e) + a)^3/(d*sec(f*x + e))^(9/2), x)
```

maple [C] time = 1.11, size = 745, normalized size = 4.23

$$-\frac{2\left(21i\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\,\sqrt{\frac{\cos\left(fx+e\right)}{1+\cos\left(fx+e\right)}}\,\sin\left(fx+e\right)\mathrm{EllipticE}\left(\frac{i\left(-1+\cos\left(fx+e\right)\right)}{\sin\left(fx+e\right)},i\right)a^3+21i\sqrt{\frac{1}{1+\cos\left(fx+e\right)}}\,\sqrt{\frac{\cos\left(fx+e\right)}{1+\cos\left(fx+e\right)}}\,\mathrm{c}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(9/2),x)
[Out] -2/45/f*(18*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*si
n(f*x+e)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a*b^2+18*I*(1/(1+cos(f*x
+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*cos(f*x+e)*sin(f*x+e)*Ellipti
cE(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a*b^2-21*I*(1/(1+cos(f*x+e)))^(1/2)*(cos
(f*x+e)/(1+cos(f*x+e)))^(1/2)*sin(f*x+e)*EllipticF(I*(-1+cos(f*x+e))/sin(f*
x+e),I)*a^3-21*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)
*cos(f*x+e)*sin(f*x+e)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a^3+5*cos(
f*x+e)^6*a^3-15*cos(f*x+e)^6*a*b^2+15*cos(f*x+e)^5*sin(f*x+e)*a^2*b-5*cos(f
*x+e)^5*sin(f*x+e)*b^3+21*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x
+e)))^(1/2)*cos(f*x+e)*sin(f*x+e)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e),I)
*a^3-18*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*sin(f*
x+e)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*a*b^2-18*I*(1/(1+cos(f*x+e))
)^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*cos(f*x+e)*sin(f*x+e)*EllipticF(I
*(-1+cos(f*x+e))/sin(f*x+e),I)*a*b^2+21*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x
+e)/(1+cos(f*x+e)))^(1/2)*sin(f*x+e)*EllipticE(I*(-1+cos(f*x+e))/sin(f*x+e)
,I)*a^3+2*cos(f*x+e)^4*a^3+21*cos(f*x+e)^4*a*b^2+9*cos(f*x+e)^3*sin(f*x+e)*
b^3+14*cos(f*x+e)^2*a^3+12*cos(f*x+e)^2*a*b^2-21*a^3*cos(f*x+e)-18*a*cos(f*
x+e)*b^2)/cos(f*x+e)^5/sin(f*x+e)/(d/cos(f*x+e))^(9/2)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(9/2),x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\tan\left(e+f\,x\right)\right)^3}{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{9/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(e + f*x))^3/(d/cos(e + f*x))^(9/2),x)
[Out] int((a + b*tan(e + f*x))^3/(d/cos(e + f*x))^(9/2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))**3/(d*sec(f*x+e))**(9/2),x)
[Out] Timed out
```

3.602 $\int \frac{(a+b\tan(e+fx))^3}{(d\sec(e+fx))^{11/2}}\,dx$

Optimal. Leaf size=218

$$\frac{10a\left(3a^2+2b^2\right)\tan(e+fx)}{77d^4f(d\sec(e+fx))^{3/2}}-\frac{2\cos^2(e+fx)\left(2b\left(7a^2+2b^2\right)-a\left(9a^2-b^2\right)\tan(e+fx)\right)}{77d^4f(d\sec(e+fx))^{3/2}}+\frac{10a\left(3a^2+2b^2\right)\sec^2(e}{77d^4f}$$

```
[Out] 10/77*a*(3*a^2+2*b^2)*(cos(1/2*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arctan(
tan(f*x+e)))*EllipticF(sin(1/2*arctan(tan(f*x+e))),2^(1/2))*(sec(f*x+e)^2)^
(3/4)/d^4/f/(d*sec(f*x+e))^(3/2)+10/77*a*(3*a^2+2*b^2)*tan(f*x+e)/d^4/f/(d*
sec(f*x+e))^(3/2)-2/11*cos(f*x+e)^4*(b-a*tan(f*x+e))*(a+b*tan(f*x+e))^2/d^4
/f/(d*sec(f*x+e))^(3/2)-2/77*cos(f*x+e)^2*(2*b*(7*a^2+2*b^2)-a*(9*a^2-b^2)*
tan(f*x+e))/d^4/f/(d*sec(f*x+e))^(3/2)
```

Rubi [A] time = 0.17, antiderivative size = 218, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {3512, 739, 778, 199, 231}

$$\frac{10a\left(3a^2+2b^2\right)\tan(e+fx)}{77d^4f(d\sec(e+fx))^{3/2}}-\frac{2\cos^2(e+fx)\left(2b\left(7a^2+2b^2\right)-a\left(9a^2-b^2\right)\tan(e+fx)\right)}{77d^4f(d\sec(e+fx))^{3/2}}+\frac{10a\left(3a^2+2b^2\right)\sec^2(e}{77d^4f}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Tan[e + f*x])^3/(d*Sec[e + f*x])^(11/2),x]
```

```
[Out] (10*a*(3*a^2 + 2*b^2)*EllipticF[ArcTan[Tan[e + f*x]]/2, 2]*(Sec[e + f*x]^2)
^(3/4))/(77*d^4*f*(d*Sec[e + f*x])^(3/2)) + (10*a*(3*a^2 + 2*b^2)*Tan[e + f
*x])/(77*d^4*f*(d*Sec[e + f*x])^(3/2)) - (2*Cos[e + f*x]^4*(b - a*Tan[e + f
*x])*(a + b*Tan[e + f*x])^2)/(11*d^4*f*(d*Sec[e + f*x])^(3/2)) - (2*Cos[e +
 f*x]^2*(2*b*(7*a^2 + 2*b^2) - a*(9*a^2 - b^2)*Tan[e + f*x]))/(77*d^4*f*(d*
Sec[e + f*x])^(3/2))
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 231

```
Int[((a_) + (b_.)*(x_)^2)^(-3/4), x_Symbol] :> Simp[(2*EllipticF[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(3/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 739

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m - 1)*(a*e - c*d*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)), x] +
 Dist[1/((p + 1)*(-2*a*c)), Int[(d + e*x)^(m - 2)*Simp[a*e^2*(m - 1) - c*d^
2*(2*p + 3) - d*c*e*(m + 2*p + 2)*x, x]*(a + c*x^2)^(p + 1), x], x] /; Free
Q[{a, c, d, e}, x] && NeQ[c*d^2 + a*e^2, 0] && LtQ[p, -1] && GtQ[m, 1] && I
ntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 778

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[((a*(e*f + d*g) - (c*d*f - a*e*g)*x)*(a + c*x^2)^(p + 1))/
```

```
(2*a*c*(p + 1)), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(2*a*c*(p + 1)), Int[(
a + c*x^2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, f, g}, x] && LtQ[p, -1]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{(a+b\tan(e+fx))^3}{(d\sec(e+fx))^{11/2}}\,dx = \frac{\sec^2(e+fx)^{3/4}\,\text{Subst}\left(\int \frac{(a+x)^3}{\left(1+\frac{x^2}{b^2}\right)^{15/4}}\,dx, x, b\tan(e+fx)\right)}{bd^4f(d\sec(e+fx))^{3/2}}$$

$$= -\frac{2\cos^4(e+fx)(b-a\tan(e+fx))(a+b\tan(e+fx))^2}{11d^4f(d\sec(e+fx))^{3/2}} + \frac{\left(2b\sec^2(e+fx)^{3/4}\right)\text{Su}}{}$$

$$= -\frac{2\cos^4(e+fx)(b-a\tan(e+fx))(a+b\tan(e+fx))^2}{11d^4f(d\sec(e+fx))^{3/2}} - \frac{2\cos^2(e+fx)\left(2b\left(7a^2\right.\right.}{77d^4f}$$

$$= \frac{10a\left(3a^2+2b^2\right)\tan(e+fx)}{77d^4f(d\sec(e+fx))^{3/2}} - \frac{2\cos^4(e+fx)(b-a\tan(e+fx))(a+b\tan(e+fx}{11d^4f(d\sec(e+fx))^{3/2}}$$

$$= \frac{10a\left(3a^2+2b^2\right)F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sec^2(e+fx)^{3/4}}{77d^4f(d\sec(e+fx))^{3/2}} + \frac{10a\left(3a^2+2b^2\right)\tan}{77d^4f(d\sec(e+}$$

Mathematica [A] time = 6.46, size = 296, normalized size = 1.36

$$\frac{\sec^3(e+fx)(a+b\tan(e+fx))^3\left(\frac{a\left(347a^2+103b^2\right)\sin(2(e+fx))}{1232}+\frac{1}{308}a\left(16a^2-15b^2\right)\sin(4(e+fx))+\frac{1}{176}a\left(a^2-3b^2\right)\right.}{f(d\sec(e+fx)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Tan[e + f*x])^3/(d*Sec[e + f*x])^(11/2),x]
```

```
[Out] (10*a*(3*a^2 + 2*b^2)*EllipticF[(e + f*x)/2, 2]*(a + b*Tan[e + f*x])^3)/(77
*f*Cos[e + f*x]^(5/2)*(d*Sec[e + f*x])^(11/2)*(a*Cos[e + f*x] + b*Sin[e + f
*x])^3) + (Sec[e + f*x]^3*(-1/616*(b*(105*a^2 + 31*b^2)) - (b*(315*a^2 + 71
*b^2)*Cos[2*(e + f*x)])/1232 - (b*(63*a^2 + b^2)*Cos[4*(e + f*x)])/616 - (b
*(3*a^2 - b^2)*Cos[6*(e + f*x)])/176 + (a*(347*a^2 + 103*b^2)*Sin[2*(e + f*
x)])/1232 + (a*(16*a^2 - 15*b^2)*Sin[4*(e + f*x)])/308 + (a*(a^2 - 3*b^2)*S
in[6*(e + f*x)])/176)*(a + b*Tan[e + f*x])^3)/(f*(d*Sec[e + f*x])^(11/2)*(a
*Cos[e + f*x] + b*Sin[e + f*x])^3)
```

fricas [F] time = 1.07, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(b^{3} \tan\left(fx+e\right)^{3}+3\,ab^{2} \tan\left(fx+e\right)^{2}+3\,a^{2}b \tan\left(fx+e\right)+a^{3}\right)\sqrt{d \sec\left(fx+e\right)}}{d^{6} \sec\left(fx+e\right)^{6}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(11/2),x, algorithm="fricas")
```

```
[Out] integral((b^3*tan(f*x + e)^3 + 3*a*b^2*tan(f*x + e)^2 + 3*a^2*b*tan(f*x + e
) + a^3)*sqrt(d*sec(f*x + e))/(d^6*sec(f*x + e)^6), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b \tan\left(fx+e\right)+a\right)^{3}}{\left(d \sec\left(fx+e\right)\right)^{\frac{11}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(11/2),x, algorithm="giac")
```

```
[Out] integrate((b*tan(f*x + e) + a)^3/(d*sec(f*x + e))^(11/2), x)
```

maple [C] time = 1.10, size = 430, normalized size = 1.97

$$-\frac{2\Big(21\left(\cos^{6}\left(fx+e\right)\right)a^{2}b-7\left(\cos^{6}\left(fx+e\right)\right)b^{3}-7\left(\cos^{5}\left(fx+e\right)\right)\sin\left(fx+e\right)a^{3}+21\left(\cos^{5}\left(fx+e\right)\right)\sin\left(fx\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(11/2),x)
```

```
[Out] -2/77/f*(21*cos(f*x+e)^6*a^2*b-7*cos(f*x+e)^6*b^3-7*cos(f*x+e)^5*sin(f*x+e)
*a^3+21*cos(f*x+e)^5*sin(f*x+e)*a*b^2-15*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*
x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*cos(f*
x+e)*a^3-10*I*cos(f*x+e)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(1/(1+co
s(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a*b^2+11*cos(f*x+e)^4*b^
3-9*cos(f*x+e)^3*sin(f*x+e)*a^3-6*cos(f*x+e)^3*sin(f*x+e)*a*b^2-15*I*(1/(1+
cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticF(I*(-1+cos(f*
x+e))/sin(f*x+e),I)*a^3-10*I*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(1/(
1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*a*b^2-15*cos(f*x+e)*
sin(f*x+e)*a^3-10*cos(f*x+e)*sin(f*x+e)*a*b^2)/cos(f*x+e)^6/(d/cos(f*x+e))^
(11/2)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^3/(d*sec(f*x+e))^(11/2),x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F]   time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a+b\tan\left(e+f\,x\right)\right)^3}{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{11/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(e + f*x))^3/(d/cos(e + f*x))^(11/2),x)
[Out] int((a + b*tan(e + f*x))^3/(d/cos(e + f*x))^(11/2), x)
```

sympy [F(-1)]   time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))**3/(d*sec(f*x+e))**(11/2),x)
[Out] Timed out
```

3.603 $\int \frac{(d\sec(e+fx))^{7/2}}{a+b\tan(e+fx)}\,dx$

Optimal. Leaf size=456

$$\frac{d^2\left(a^2+b^2\right)^{3/4}(d\sec(e+fx))^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{b^{5/2}f\sec^2(e+fx)^{3/4}}-\frac{d^2\left(a^2+b^2\right)^{3/4}(d\sec(e+fx))^{3/2}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{b^{5/2}f\sec^2(e+fx)^{3/4}}-$$

```
[Out] 2/3*d^2*(d*sec(f*x+e))^(3/2)/b/f+(a^2+b^2)^(3/4)*d^2*arctan((sec(f*x+e)^2)^
(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(d*sec(f*x+e))^(3/2)/b^(5/2)/f/(sec(f*x+e)^2
)^(3/4)-(a^2+b^2)^(3/4)*d^2*arctanh((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^
(1/4))*(d*sec(f*x+e))^(3/2)/b^(5/2)/f/(sec(f*x+e)^2)^(3/4)+2*a*d^2*(cos(1/2
*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arctan(tan(f*x+e)))*EllipticE(sin(1/2
*arctan(tan(f*x+e))),2^(1/2))*(d*sec(f*x+e))^(3/2)/b^2/f/(sec(f*x+e)^2)^(3/
4)-2*a*d^2*cos(f*x+e)*(d*sec(f*x+e))^(3/2)*sin(f*x+e)/b^2/f-a*d^2*cot(f*x+e
)*EllipticPi((sec(f*x+e)^2)^(1/4),-b/(a^2+b^2)^(1/2),I)*(d*sec(f*x+e))^(3/2
)*(a^2+b^2)^(1/2)*(-tan(f*x+e)^2)^(1/2)/b^3/f/(sec(f*x+e)^2)^(3/4)+a*d^2*co
t(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1/4),b/(a^2+b^2)^(1/2),I)*(d*sec(f*x+e)
)^(3/2)*(a^2+b^2)^(1/2)*(-tan(f*x+e)^2)^(1/2)/b^3/f/(sec(f*x+e)^2)^(3/4)
```

Rubi [A] time = 0.41, antiderivative size = 456, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 15, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {3512, 735, 844, 227, 196, 746, 399, 490, 1213, 537, 444, 63, 298, 205, 208}

$$\frac{d^2\left(a^2+b^2\right)^{3/4}(d\sec(e+fx))^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{b^{5/2}f\sec^2(e+fx)^{3/4}}-\frac{d^2\left(a^2+b^2\right)^{3/4}(d\sec(e+fx))^{3/2}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{b^{5/2}f\sec^2(e+fx)^{3/4}}-$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(7/2)/(a + b*Tan[e + f*x]),x]
```

```
[Out] (2*d^2*(d*Sec[e + f*x])^(3/2))/(3*b*f) + ((a^2 + b^2)^(3/4)*d^2*ArcTan[(Sqr
t[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*(d*Sec[e + f*x])^(3/2))/(b^
(5/2)*f*(Sec[e + f*x]^2)^(3/4)) - ((a^2 + b^2)^(3/4)*d^2*ArcTanh[(Sqrt[b]*(
Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*(d*Sec[e + f*x])^(3/2))/(b^(5/2)*
f*(Sec[e + f*x]^2)^(3/4)) + (2*a*d^2*EllipticE[ArcTan[Tan[e + f*x]]/2, 2]*(
d*Sec[e + f*x])^(3/2))/(b^2*f*(Sec[e + f*x]^2)^(3/4)) - (2*a*d^2*Cos[e + f*
x]*(d*Sec[e + f*x])^(3/2)*Sin[e + f*x])/(b^2*f) - (a*Sqrt[a^2 + b^2]*d^2*Co
t[e + f*x]*EllipticPi[-(b/Sqrt[a^2 + b^2]), ArcSin[(Sec[e + f*x]^2)^(1/4)],
 -1]*(d*Sec[e + f*x])^(3/2)*Sqrt[-Tan[e + f*x]^2])/(b^3*f*(Sec[e + f*x]^2)^
(3/4)) + (a*Sqrt[a^2 + b^2]*d^2*Cot[e + f*x]*EllipticPi[b/Sqrt[a^2 + b^2],
ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*(d*Sec[e + f*x])^(3/2)*Sqrt[-Tan[e + f*
x]^2])/(b^3*f*(Sec[e + f*x]^2)^(3/4))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 196

```
Int[((a_) + (b_.)*(x_)^2)^(-5/4), x_Symbol] :> Simp[(2*EllipticE[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(5/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 227

```
Int[((a_) + (b_.)*(x_)^2)^(-1/4), x_Symbol] :> Simp[(2*x)/(a + b*x^2)^(1/4)
, x] - Dist[a, Int[1/(a + b*x^2)^(5/4), x], x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 298

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[-(a/b
), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s/(2*b), Int[1/(r + s*x^2), x
], x] - Dist[s/(2*b), Int[1/(r - s*x^2), x], x]] /; FreeQ[{a, b}, x] &&  !G
tQ[a/b, 0]
```

Rule 399

```
Int[1/(((a_) + (b_.)*(x_)^2)^(1/4)*((c_) + (d_.)*(x_)^2)), x_Symbol] :> Dis
t[(2*Sqrt[-((b*x^2)/a)])/x, Subst[Int[x^2/(Sqrt[1 - x^4/a]*(b*c - a*d + d*x
^4)), x], x, (a + b*x^2)^(1/4)], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c -
a*d, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 490

```
Int[(x_)^2/(((a_) + (b_.)*(x_)^4)*Sqrt[(c_) + (d_.)*(x_)^4]), x_Symbol] :>
With[{r = Numerator[Rt[-(a/b), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s
/(2*b), Int[1/((r + s*x^2)*Sqrt[c + d*x^4]), x], x] - Dist[s/(2*b), Int[1/(
(r - s*x^2)*Sqrt[c + d*x^4]), x], x]] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c
- a*d, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] &&  !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] &&  !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 735

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m + 1)*(a + c*x^2)^p)/(e*(m + 2*p + 1)), x] + Dist[(2*p)/(e*(m
+ 2*p + 1)), Int[(d + e*x)^m*Simp[a*e - c*d*x, x]*(a + c*x^2)^(p - 1), x],
x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] && GtQ[p, 0] && Ne
Q[m + 2*p + 1, 0] && ( !RationalQ[m] || LtQ[m, 1]) &&  !ILtQ[m + 2*p, 0] &&
```

```
IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 746

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(1/4)), x_Symbol] :> Dist[
d, Int[1/((d^2 - e^2*x^2)*(a + c*x^2)^(1/4)), x], x] - Dist[e, Int[x/((d^2
- e^2*x^2)*(a + c*x^2)^(1/4)), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^
2 + a*e^2, 0]
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 1213

```
Int[1/(((d_) + (e_.)*(x_)^2)*Sqrt[(a_) + (c_.)*(x_)^4]), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[Sqrt[-c], Int[1/((d + e*x^2)*Sqrt[q + c*x^2]*Sqrt
[q - c*x^2]), x], x]] /; FreeQ[{a, c, d, e}, x] && GtQ[a, 0] && LtQ[c, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{(d\sec(e+fx))^{7/2}}{a+b\tan(e+fx)}\,dx = \frac{\left(d^2(d\sec(e+fx))^{3/2}\right)\text{Subst}\left(\int \frac{\left(1+\frac{x^2}{b^2}\right)^{3/4}}{a+x}\,dx, x, b\tan(e+fx)\right)}{bf\sec^2(e+fx)^{3/4}}$$

$$= \frac{2d^2(d\sec(e+fx))^{3/2}}{3bf} + \frac{\left(d^2(d\sec(e+fx))^{3/2}\right)\text{Subst}\left(\int \frac{1-\frac{ax}{b^2}}{(a+x)\sqrt[4]{1+\frac{x^2}{b^2}}}\,dx, x, b\tan(e+\ldots\right.}{bf\sec^2(e+fx)^{3/4}}$$

$$= \frac{2d^2(d\sec(e+fx))^{3/2}}{3bf} - \frac{\left(ad^2(d\sec(e+fx))^{3/2}\right)\text{Subst}\left(\int \frac{1}{\sqrt[4]{1+\frac{x^2}{b^2}}}\,dx, x, b\tan(e+fx)\right)}{b^3f\sec^2(e+fx)^{3/4}}$$

$$= \frac{2d^2(d\sec(e+fx))^{3/2}}{3bf} - \frac{2ad^2\cos(e+fx)(d\sec(e+fx))^{3/2}\sin(e+fx)}{b^2f} + \frac{\left(ad^2(d\sec\ldots\right.}{\ldots}$$

$$= \frac{2d^2(d\sec(e+fx))^{3/2}}{3bf} + \frac{2ad^2E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)(d\sec(e+fx))^{3/2}}{b^2f\sec^2(e+fx)^{3/4}} - \frac{2ad^2\,\mathrm{c}\ldots}{\ldots}$$

$$= \frac{2d^2(d\sec(e+fx))^{3/2}}{3bf} + \frac{2ad^2E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)(d\sec(e+fx))^{3/2}}{b^2f\sec^2(e+fx)^{3/4}} - \frac{2ad^2\,\mathrm{c}\ldots}{\ldots}$$

$$= \frac{2d^2(d\sec(e+fx))^{3/2}}{3bf} + \frac{2ad^2E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)(d\sec(e+fx))^{3/2}}{b^2f\sec^2(e+fx)^{3/4}} - \frac{2ad^2\,\mathrm{c}\ldots}{\ldots}$$

$$= \frac{2d^2(d\sec(e+fx))^{3/2}}{3bf} + \frac{\left(a^2+b^2\right)^{3/4}d^2\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)(d\sec(e+fx))^{3/2}}{b^{5/2}f\sec^2(e+fx)^{3/4}} - \frac{(a\ldots}{\ldots}$$

Mathematica [B] time = 29.53, size = 7284, normalized size = 15.97

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Sec[e + f*x])^(7/2)/(a + b*Tan[e + f*x]),x]
[Out] Result too large to show
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(7/2)/(a+b*tan(f*x+e)),x, algorithm="fricas")
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(fx+e\right)\right)^{\frac{7}{2}}}{b \tan\left(fx+e\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(7/2)/(a+b*tan(f*x+e)),x, algorithm="giac")
[Out] integrate((d*sec(f*x + e))^(7/2)/(b*tan(f*x + e) + a), x)
```

maple [B] time = 1.79, size = 26371, normalized size = 57.83

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(7/2)/(a+b*tan(f*x+e)),x)
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(fx+e\right)\right)^{\frac{7}{2}}}{b \tan\left(fx+e\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(7/2)/(a+b*tan(f*x+e)),x, algorithm="maxima")
[Out] integrate((d*sec(f*x + e))^(7/2)/(b*tan(f*x + e) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{7/2}}{a+b\,\tan\left(e+f\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(7/2)/(a + b*tan(e + f*x)),x)
[Out] int((d/cos(e + f*x))^(7/2)/(a + b*tan(e + f*x)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(7/2)/(a+b*tan(f*x+e)),x)
[Out] Timed out
```

3.604 $\int \frac{(d\sec(e+fx))^{5/2}}{a+b\tan(e+fx)}\,dx$

Optimal. Leaf size=396

$$\frac{ad^2\sqrt{-\tan^2(e+fx)}\cot(e+fx)\sqrt{d\sec(e+fx)}\,\Pi\left(-\frac{b}{\sqrt{a^2+b^2}};\sin^{-1}\left(\sqrt[4]{\sec^2(e+fx)}\right)\middle|-1\right)}{b^2f\sqrt[4]{\sec^2(e+fx)}}+\frac{ad^2\sqrt{-\tan^2(e+f}{}$$

```
[Out] 2*d^2*(d*sec(f*x+e))^(1/2)/b/f-(a^2+b^2)^(1/4)*d^2*arctan((sec(f*x+e)^2)^(1
/4)*b^(1/2)/(a^2+b^2)^(1/4))*(d*sec(f*x+e))^(1/2)/b^(3/2)/f/(sec(f*x+e)^2)^
(1/4)-(a^2+b^2)^(1/4)*d^2*arctanh((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1
/4))*(d*sec(f*x+e))^(1/2)/b^(3/2)/f/(sec(f*x+e)^2)^(1/4)-2*a*d^2*(cos(1/2*a
rctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arctan(tan(f*x+e)))*EllipticF(sin(1/2*a
rctan(tan(f*x+e))),2^(1/2))*(d*sec(f*x+e))^(1/2)/b^2/f/(sec(f*x+e)^2)^(1/4)
+a*d^2*cot(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1/4),-b/(a^2+b^2)^(1/2),I)*(d*
sec(f*x+e))^(1/2)*(-tan(f*x+e)^2)^(1/2)/b^2/f/(sec(f*x+e)^2)^(1/4)+a*d^2*co
t(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1/4),b/(a^2+b^2)^(1/2),I)*(d*sec(f*x+e)
)^(1/2)*(-tan(f*x+e)^2)^(1/2)/b^2/f/(sec(f*x+e)^2)^(1/4)
```

Rubi [A] time = 0.38, antiderivative size = 396, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 15, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.600$, Rules used = {3512, 735, 844, 231, 747, 401, 108, 409, 1213, 537, 444, 63, 212, 208, 205}

$$-\frac{d^2\sqrt[4]{a^2+b^2}\sqrt{d\sec(e+fx)}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{b^{3/2}f\sqrt[4]{\sec^2(e+fx)}}-\frac{d^2\sqrt[4]{a^2+b^2}\sqrt{d\sec(e+fx)}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{b^{3/2}f\sqrt[4]{\sec^2(e+fx)}}+\frac{ad^2}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(5/2)/(a + b*Tan[e + f*x]),x]
```

```
[Out] (2*d^2*Sqrt[d*Sec[e + f*x]])/(b*f) - ((a^2 + b^2)^(1/4)*d^2*ArcTan[(Sqrt[b]
*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*Sqrt[d*Sec[e + f*x]])/(b^(3/2)*
f*(Sec[e + f*x]^2)^(1/4)) - ((a^2 + b^2)^(1/4)*d^2*ArcTanh[(Sqrt[b]*(Sec[e
+ f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*Sqrt[d*Sec[e + f*x]])/(b^(3/2)*f*(Sec[e
 + f*x]^2)^(1/4)) - (2*a*d^2*EllipticF[ArcTan[Tan[e + f*x]]/2, 2]*Sqrt[d*Se
c[e + f*x]])/(b^2*f*(Sec[e + f*x]^2)^(1/4)) + (a*d^2*Cot[e + f*x]*EllipticP
i[-(b/Sqrt[a^2 + b^2]), ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*Sqrt[d*Sec[e +
f*x]]*Sqrt[-Tan[e + f*x]^2])/(b^2*f*(Sec[e + f*x]^2)^(1/4)) + (a*d^2*Cot[e
+ f*x]*EllipticPi[b/Sqrt[a^2 + b^2], ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*Sq
rt[d*Sec[e + f*x]]*Sqrt[-Tan[e + f*x]^2])/(b^2*f*(Sec[e + f*x]^2)^(1/4))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 108

```
Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(
3/4)), x_Symbol] :> Dist[-4, Subst[Int[1/((b*e - a*f - b*x^4)*Sqrt[c - (d*e
)/f + (d*x^4)/f]), x], x, (e + f*x)^(1/4)], x] /; FreeQ[{a, b, c, d, e, f},
 x] && GtQ[-(f/(d*e - c*f)), 0]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^4)^(-1), x_Symbol] :> With[{r = Numerator[Rt[-(a/b),
 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[r/(2*a), Int[1/(r - s*x^2), x],
 x] + Dist[r/(2*a), Int[1/(r + s*x^2), x], x]] /; FreeQ[{a, b}, x] &&  !GtQ
[a/b, 0]
```

Rule 231

```
Int[((a_) + (b_.)*(x_)^2)^(-3/4), x_Symbol] :> Simp[(2*EllipticF[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(3/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 401

```
Int[1/(((a_) + (b_.)*(x_)^2)^(3/4)*((c_) + (d_.)*(x_)^2)), x_Symbol] :> Dis
t[Sqrt[-((b*x^2)/a)]/(2*x), Subst[Int[1/(Sqrt[-((b*x)/a)]*(a + b*x)^(3/4)*(
c + d*x)), x], x, x^2], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 409

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^4]*((c_) + (d_.)*(x_)^4)), x_Symbol] :> Dist[
1/(2*c), Int[1/(Sqrt[a + b*x^4]*(1 - Rt[-(d/c), 2]*x^2)), x], x] + Dist[1/(
2*c), Int[1/(Sqrt[a + b*x^4]*(1 + Rt[-(d/c), 2]*x^2)), x], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] &&  !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] &&  !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 735

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m + 1)*(a + c*x^2)^p)/(e*(m + 2*p + 1)), x] + Dist[(2*p)/(e*(m
+ 2*p + 1)), Int[(d + e*x)^m*Simp[a*e - c*d*x, x]*(a + c*x^2)^(p - 1), x],
x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] && GtQ[p, 0] && Ne
Q[m + 2*p + 1, 0] && ( !RationalQ[m] || LtQ[m, 1]) &&  !ILtQ[m + 2*p, 0] &&
 IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 747

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(3/4)), x_Symbol] :> Dist[
d, Int[1/((d^2 - e^2*x^2)*(a + c*x^2)^(3/4)), x], x] - Dist[e, Int[x/((d^2
- e^2*x^2)*(a + c*x^2)^(3/4)), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^
2 + a*e^2, 0]
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 1213

```
Int[1/(((d_) + (e_.)*(x_)^2)*Sqrt[(a_) + (c_.)*(x_)^4]), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[Sqrt[-c], Int[1/((d + e*x^2)*Sqrt[q + c*x^2]*Sqrt
[q - c*x^2]), x], x]] /; FreeQ[{a, c, d, e}, x] && GtQ[a, 0] && LtQ[c, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{(d\sec(e+fx))^{5/2}}{a+b\tan(e+fx)}\,dx = \frac{\left(d^2\sqrt{d\sec(e+fx)}\right)\text{Subst}\left(\int \frac{\sqrt[4]{1+\frac{x^2}{b^2}}}{a+x}\,dx, x, b\tan(e+fx)\right)}{bf\sqrt[4]{\sec^2(e+fx)}}$$

$$= \frac{2d^2\sqrt{d\sec(e+fx)}}{bf} + \frac{\left(d^2\sqrt{d\sec(e+fx)}\right)\text{Subst}\left(\int \frac{1-\frac{ax}{b^2}}{(a+x)\left(1+\frac{x^2}{b^2}\right)^{3/4}}\,dx, x, b\tan(e+fx)\right)}{bf\sqrt[4]{\sec^2(e+fx)}}$$

$$= \frac{2d^2\sqrt{d\sec(e+fx)}}{bf} - \frac{\left(ad^2\sqrt{d\sec(e+fx)}\right)\text{Subst}\left(\int \frac{1}{\left(1+\frac{x^2}{b^2}\right)^{3/4}}\,dx, x, b\tan(e+fx)\right)}{b^3f\sqrt[4]{\sec^2(e+fx)}} + \cdots$$

$$= \frac{2d^2\sqrt{d\sec(e+fx)}}{bf} - \frac{2ad^2F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{b^2f\sqrt[4]{\sec^2(e+fx)}} - \frac{\left(\left(1+\frac{a^2}{b^2}\right)d^2\cdots\right.}{\cdots}$$

$$= \frac{2d^2\sqrt{d\sec(e+fx)}}{bf} - \frac{2ad^2F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{b^2f\sqrt[4]{\sec^2(e+fx)}} - \frac{\left(\left(1+\frac{a^2}{b^2}\right)d^2\cdots\right.}{\cdots}$$

$$= \frac{2d^2\sqrt{d\sec(e+fx)}}{bf} - \frac{2ad^2F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{b^2f\sqrt[4]{\sec^2(e+fx)}} - \frac{\left(2\left(1+\frac{a^2}{b^2}\right)b\cdots\right.}{\cdots}$$

$$= \frac{2d^2\sqrt{d\sec(e+fx)}}{bf} - \frac{2ad^2F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{b^2f\sqrt[4]{\sec^2(e+fx)}} - \frac{\left(\left(1+\frac{a^2}{b^2}\right)bd^2\cdots\right.}{\cdots}$$

$$= \frac{2d^2\sqrt{d\sec(e+fx)}}{bf} - \frac{\sqrt[4]{a^2+b^2}\,d^2\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt{d\sec(e+fx)}}{b^{3/2}f\sqrt[4]{\sec^2(e+fx)}} - \frac{\sqrt[4]{a^2+b^2}\,d\cdots}{\cdots}$$

$$= \frac{2d^2\sqrt{d\sec(e+fx)}}{bf} - \frac{\sqrt[4]{a^2+b^2}\,d^2\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt{d\sec(e+fx)}}{b^{3/2}f\sqrt[4]{\sec^2(e+fx)}} - \frac{\sqrt[4]{a^2+b^2}\,d\cdots}{\cdots}$$

Mathematica [B] time = 25.03, size = 6607, normalized size = 16.68

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Sec[e + f*x])^(5/2)/(a + b*Tan[e + f*x]),x]
```

```
[Out] Result too large to show
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e)),x, algorithm="fricas")
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(fx+e\right)\right)^{\frac{5}{2}}}{b \tan\left(fx+e\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e)),x, algorithm="giac")
[Out] integrate((d*sec(f*x + e))^(5/2)/(b*tan(f*x + e) + a), x)
```

maple [B] time = 1.52, size = 10704, normalized size = 27.03

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e)),x)
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(fx+e\right)\right)^{\frac{5}{2}}}{b \tan\left(fx+e\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e)),x, algorithm="maxima")
[Out] integrate((d*sec(f*x + e))^(5/2)/(b*tan(f*x + e) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{5/2}}{a+b\tan\left(e+f\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(5/2)/(a + b*tan(e + f*x)),x)
[Out] int((d/cos(e + f*x))^(5/2)/(a + b*tan(e + f*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(e+fx\right)\right)^{\frac{5}{2}}}{a+b \tan\left(e+fx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(5/2)/(a+b*tan(f*x+e)),x)
[Out] Integral((d*sec(e + f*x))**(5/2)/(a + b*tan(e + f*x)), x)
```

3.605 $\int \frac{(d\sec(e+fx))^{3/2}}{a+b\tan(e+fx)}\,dx$

Optimal. Leaf size=334

$$\frac{(d\sec(e+fx))^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{\sqrt{b}f\sqrt[4]{a^2+b^2}\sec^2(e+fx)^{3/4}}-\frac{(d\sec(e+fx))^{3/2}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{\sqrt{b}f\sqrt[4]{a^2+b^2}\sec^2(e+fx)^{3/4}}-\frac{a\sqrt{-\tan^2(e+fx)}\cot(e+f}{}$$

```
[Out] arctan((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(d*sec(f*x+e))^(3/2)/(
a^2+b^2)^(1/4)/f/(sec(f*x+e)^2)^(3/4)/b^(1/2)-arctanh((sec(f*x+e)^2)^(1/4)*
b^(1/2)/(a^2+b^2)^(1/4))*(d*sec(f*x+e))^(3/2)/(a^2+b^2)^(1/4)/f/(sec(f*x+e)
^2)^(3/4)/b^(1/2)-a*cot(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1/4),-b/(a^2+b^2)
^(1/2),I)*(d*sec(f*x+e))^(3/2)*(-tan(f*x+e)^2)^(1/2)/b/f/(sec(f*x+e)^2)^(3/
4)/(a^2+b^2)^(1/2)+a*cot(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1/4),b/(a^2+b^2)
^(1/2),I)*(d*sec(f*x+e))^(3/2)*(-tan(f*x+e)^2)^(1/2)/b/f/(sec(f*x+e)^2)^(3/
4)/(a^2+b^2)^(1/2)
```

Rubi [A] time = 0.29, antiderivative size = 334, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.440$, Rules used = {3512, 746, 399, 490, 1213, 537, 444, 63, 298, 205, 208}

$$\frac{(d\sec(e+fx))^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{\sqrt{b}f\sqrt[4]{a^2+b^2}\sec^2(e+fx)^{3/4}}-\frac{(d\sec(e+fx))^{3/2}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{\sqrt{b}f\sqrt[4]{a^2+b^2}\sec^2(e+fx)^{3/4}}-\frac{a\sqrt{-\tan^2(e+fx)}\cot(e+f}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(3/2)/(a + b*Tan[e + f*x]),x]
```

```
[Out] (ArcTan[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*(d*Sec[e + f*x]
)^(3/2))/(Sqrt[b]*(a^2 + b^2)^(1/4)*f*(Sec[e + f*x]^2)^(3/4)) - (ArcTanh[(S
qrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*(d*Sec[e + f*x])^(3/2))/(
Sqrt[b]*(a^2 + b^2)^(1/4)*f*(Sec[e + f*x]^2)^(3/4)) - (a*Cot[e + f*x]*Ellip
ticPi[-(b/Sqrt[a^2 + b^2]), ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*(d*Sec[e +
f*x])^(3/2)*Sqrt[-Tan[e + f*x]^2])/(b*Sqrt[a^2 + b^2]*f*(Sec[e + f*x]^2)^(3
/4)) + (a*Cot[e + f*x]*EllipticPi[b/Sqrt[a^2 + b^2], ArcSin[(Sec[e + f*x]^2
)^(1/4)], -1]*(d*Sec[e + f*x])^(3/2)*Sqrt[-Tan[e + f*x]^2])/(b*Sqrt[a^2 + b
^2]*f*(Sec[e + f*x]^2)^(3/4))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 298

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[-(a/b
), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s/(2*b), Int[1/(r + s*x^2), x
], x] - Dist[s/(2*b), Int[1/(r - s*x^2), x], x]] /; FreeQ[{a, b}, x] &&  !G
tQ[a/b, 0]
```

Rule 399

```
Int[1/(((a_) + (b_.)*(x_)^2)^(1/4)*((c_) + (d_.)*(x_)^2)), x_Symbol] :> Dis
t[(2*Sqrt[-((b*x^2)/a)])/x, Subst[Int[x^2/(Sqrt[1 - x^4/a]*(b*c - a*d + d*x
^4)), x], x, (a + b*x^2)^(1/4)], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c -
a*d, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 490

```
Int[(x_)^2/(((a_) + (b_.)*(x_)^4)*Sqrt[(c_) + (d_.)*(x_)^4]), x_Symbol] :>
With[{r = Numerator[Rt[-(a/b), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s
/(2*b), Int[1/((r + s*x^2)*Sqrt[c + d*x^4]), x], x] - Dist[s/(2*b), Int[1/(
(r - s*x^2)*Sqrt[c + d*x^4]), x], x]] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c
- a*d, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] &&  !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] &&  !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 746

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(1/4)), x_Symbol] :> Dist[
d, Int[1/((d^2 - e^2*x^2)*(a + c*x^2)^(1/4)), x], x] - Dist[e, Int[x/((d^2
- e^2*x^2)*(a + c*x^2)^(1/4)), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^
2 + a*e^2, 0]
```

Rule 1213

```
Int[1/(((d_) + (e_.)*(x_)^2)*Sqrt[(a_) + (c_.)*(x_)^4]), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[Sqrt[-c], Int[1/((d + e*x^2)*Sqrt[q + c*x^2]*Sqrt
[q - c*x^2]), x], x]] /; FreeQ[{a, c, d, e}, x] && GtQ[a, 0] && LtQ[c, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{(d\sec(e+fx))^{3/2}}{a+b\tan(e+fx)}\,dx = \frac{(d\sec(e+fx))^{3/2}\,\text{Subst}\left(\int \frac{1}{(a+x)\sqrt[4]{1+\frac{x^2}{b^2}}}\,dx, x, b\tan(e+fx)\right)}{bf\sec^2(e+fx)^{3/4}}$$

$$= -\frac{(d\sec(e+fx))^{3/2}\,\text{Subst}\left(\int \frac{x}{(a^2-x^2)\sqrt[4]{1+\frac{x^2}{b^2}}}\,dx, x, b\tan(e+fx)\right)}{bf\sec^2(e+fx)^{3/4}} + \frac{\left(a(d\sec(e+fx))^{3/2}\right)}{}$$

$$= -\frac{(d\sec(e+fx))^{3/2}\,\text{Subst}\left(\int \frac{1}{(a^2-x)\sqrt[4]{1+\frac{x}{b^2}}}\,dx, x, b^2\tan^2(e+fx)\right)}{2bf\sec^2(e+fx)^{3/4}} + \frac{\left(2a\cot(e+fx)(d\,\text{se}\right.}{}$$

$$= -\frac{\left(2b(d\sec(e+fx))^{3/2}\right)\text{Subst}\left(\int \frac{x^2}{a^2+b^2-b^2x^4}\,dx, x, \sqrt[4]{\sec^2(e+fx)}\right)}{f\sec^2(e+fx)^{3/4}} + \frac{\left(a\cot(e+fx)(d\,\text{s}\right.}{}$$

$$= -\frac{(d\sec(e+fx))^{3/2}\,\text{Subst}\left(\int \frac{1}{\sqrt{a^2+b^2}-bx^2}\,dx, x, \sqrt[4]{\sec^2(e+fx)}\right)}{f\sec^2(e+fx)^{3/4}} + \frac{(d\sec(e+fx))^{3/2}\,\text{Sub}}{}$$

$$= \frac{\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)(d\sec(e+fx))^{3/2}}{\sqrt{b}\sqrt[4]{a^2+b^2}\,f\sec^2(e+fx)^{3/4}} - \frac{\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)(d\sec(e+fx))^{3/2}}{\sqrt{b}\sqrt[4]{a^2+b^2}\,f\sec^2(e+fx)^{3/4}} -$$

Mathematica [C] time = 21.94, size = 6301, normalized size = 18.87

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Sec[e + f*x])^(3/2)/(a + b*Tan[e + f*x]),x]
[Out] Result too large to show
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e)),x, algorithm="fricas")
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(fx+e\right)\right)^{\frac{3}{2}}}{b\tan\left(fx+e\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e)),x, algorithm="giac")
[Out] integrate((d*sec(f*x + e))^(3/2)/(b*tan(f*x + e) + a), x)
```

maple [B] time = 1.36, size = 3737, normalized size = 11.19

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e)),x)
```

```
[Out] 1/2/f*(1+cos(f*x+e))^2*(-4*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*
x+e)))^(1/2)*(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a
^4)^(1/2)*(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4
)^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(a^2+b^2)^(1/2)*a*b^3-4*I
*b*a^3*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticP
i(I*(-1+cos(f*x+e))/sin(f*x+e),-1/(-b+(a^2+b^2)^(1/2))^2*a^2,I)*(b*((a^2+b^
2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)*(-b*((a^2+b^2)
^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)*(a^2+b^2)^(1/2)-
4*I*b*a^3*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*Ellipt
icPi(I*(-1+cos(f*x+e))/sin(f*x+e),-1/(b+(a^2+b^2)^(1/2))^2*a^2,I)*(b*((a^2+
b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)*(-b*((a^2+b^
2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)*(a^2+b^2)^(1/2
)+4*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*(b*((a^2+b
^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)*(-b*((a^2+b^2
)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)*EllipticF(I*(-1
+cos(f*x+e))/sin(f*x+e),I)*(a^2+b^2)^(3/2)*a*b+(-cos(f*x+e)/(1+cos(f*x+e))^
2)^(1/2)*ln(-(2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)^2-cos(f*x+e
)^2-2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)+2*cos(f*x+e)-1)/sin(f*x+e)^2)*(b
*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)*(-b*(
(a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)*(a^2+b^
2)^(3/2)*a^2-(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*ln(-(2*(-cos(f*x+e)/(1+co
s(f*x+e))^2)^(1/2)*cos(f*x+e)^2-cos(f*x+e)^2-2*(-cos(f*x+e)/(1+cos(f*x+e))^
2)^(1/2)+2*cos(f*x+e)-1)/sin(f*x+e)^2)*(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^
(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)*(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1
/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)*(a^2+b^2)^(1/2)*a^2*b^2-(-cos(f*x+e)/(1+c
os(f*x+e))^2)^(1/2)*(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2
*b^3)/a^4)^(1/2)*(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b
^3)/a^4)^(1/2)*ln(-2*(2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)^2-c
os(f*x+e)^2-2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)+2*cos(f*x+e)-1)/sin(f*x+
e)^2)*(a^2+b^2)^(3/2)*a^2+(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*(b*((a^2+b^2
)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)*(-b*((a^2+b^2)^
(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)*ln(-2*(2*(-cos(f*
x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)^2-cos(f*x+e)^2-2*(-cos(f*x+e)/(1+co
s(f*x+e))^2)^(1/2)+2*cos(f*x+e)-1)/sin(f*x+e)^2)*(a^2+b^2)^(1/2)*a^2*b^2+(-
cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*ln(2)*(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2
)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)*(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^
(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)*(a^2+b^2)^(3/2)*a^2-(-cos(f*x+e)/(1+cos
(f*x+e))^2)^(1/2)*ln(2)*(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2
*b+2*b^3)/a^4)^(1/2)*(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b
-2*b^3)/a^4)^(1/2)*(a^2+b^2)^(1/2)*a^2*b^2+(-cos(f*x+e)/(1+cos(f*x+e))^2)^(
1/2)*(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2
)*arctanh(1/2*(-1+cos(f*x+e))*(cos(f*x+e)*(a^2+b^2)^(1/2)*b-cos(f*x+e)*a^2-
cos(f*x+e)*b^2-b*(a^2+b^2)^(1/2)+b^2)/sin(f*x+e)^2/(-cos(f*x+e)/(1+cos(f*x+
e))^2)^(1/2)/(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/
a^4)^(1/2)/a^2)*(a^2+b^2)^(3/2)*b^2-(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*(b
*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)*arcta
nh(1/2*(-1+cos(f*x+e))*(cos(f*x+e)*(a^2+b^2)^(1/2)*b-cos(f*x+e)*a^2-cos(f*x
+e)*b^2-b*(a^2+b^2)^(1/2)+b^2)/sin(f*x+e)^2/(-cos(f*x+e)/(1+cos(f*x+e))^2)^
(1/2)/(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1
/2)/a^2)*(a^2+b^2)^(1/2)*b^4-(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*(b*((a^2+
b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)*arctanh(1/2*
(-1+cos(f*x+e))*(cos(f*x+e)*(a^2+b^2)^(1/2)*b-cos(f*x+e)*a^2-cos(f*x+e)*b^2
```

```
-b*(a^2+b^2)^(1/2)+b^2)/sin(f*x+e)^2/(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)/(
-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)/a^2
)*a^4*b-(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*(b*((a^2+b^2)^(1/2)*a^2+2*(a^2
+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)*arctanh(1/2*(-1+cos(f*x+e))*(cos(
f*x+e)*(a^2+b^2)^(1/2)*b-cos(f*x+e)*a^2-cos(f*x+e)*b^2-b*(a^2+b^2)^(1/2)+b^
2)/sin(f*x+e)^2/(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)/(-b*((a^2+b^2)^(1/2)*a
^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)/a^2)*a^2*b^3-(-cos(f*x+e
)/(1+cos(f*x+e))^2)^(1/2)*arctanh(1/2*(-1+cos(f*x+e))*(cos(f*x+e)*(a^2+b^2)
^(1/2)*b+cos(f*x+e)*a^2+cos(f*x+e)*b^2-b*(a^2+b^2)^(1/2)-b^2)/sin(f*x+e)^2/
(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)/(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1
/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)/a^2)*(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)
^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)*(a^2+b^2)^(3/2)*b^2+(-cos(f*x+e)/(1+co
s(f*x+e))^2)^(1/2)*arctanh(1/2*(-1+cos(f*x+e))*(cos(f*x+e)*(a^2+b^2)^(1/2)*
b+cos(f*x+e)*a^2+cos(f*x+e)*b^2-b*(a^2+b^2)^(1/2)-b^2)/sin(f*x+e)^2/(-cos(f
*x+e)/(1+cos(f*x+e))^2)^(1/2)/(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2
+2*a^2*b+2*b^3)/a^4)^(1/2)/a^2)*(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*
b^2-2*a^2*b-2*b^3)/a^4)^(1/2)*(a^2+b^2)^(1/2)*b^4-(-cos(f*x+e)/(1+cos(f*x+e
))^2)^(1/2)*arctanh(1/2*(-1+cos(f*x+e))*(cos(f*x+e)*(a^2+b^2)^(1/2)*b+cos(f
*x+e)*a^2+cos(f*x+e)*b^2-b*(a^2+b^2)^(1/2)-b^2)/sin(f*x+e)^2/(-cos(f*x+e)/(
1+cos(f*x+e))^2)^(1/2)/(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*
b+2*b^3)/a^4)^(1/2)/a^2)*(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a
^2*b-2*b^3)/a^4)^(1/2)*a^4*b-(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*arctanh(1
/2*(-1+cos(f*x+e))*(cos(f*x+e)*(a^2+b^2)^(1/2)*b+cos(f*x+e)*a^2+cos(f*x+e)*
b^2-b*(a^2+b^2)^(1/2)-b^2)/sin(f*x+e)^2/(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2
)/(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)/a
^2)*(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2
)*a^2*b^3)*(-1+cos(f*x+e))*(d/cos(f*x+e))^(3/2)*cos(f*x+e)/sin(f*x+e)^2/b/a
^2/(-b+(a^2+b^2)^(1/2))/(a^2+b^2)^(1/2)/(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)
^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)/(b+(a^2+b^2)^(1/2))/(-b*((a^2+b^2)^(1/
2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(fx+e\right)\right)^{\frac{3}{2}}}{b \tan\left(fx+e\right)+a}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e)),x, algorithm="maxima")
[Out] integrate((d*sec(f*x + e))^(3/2)/(b*tan(f*x + e) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{3/2}}{a+b\,\tan\left(e+f\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(3/2)/(a + b*tan(e + f*x)),x)
[Out] int((d/cos(e + f*x))^(3/2)/(a + b*tan(e + f*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(e+fx\right)\right)^{\frac{3}{2}}}{a+b \tan\left(e+fx\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(3/2)/(a+b*tan(f*x+e)),x)
```

```
[Out] Integral((d*sec(e + f*x))**(3/2)/(a + b*tan(e + f*x)), x)
```

3.606 $\int \frac{\sqrt{d\sec(e+fx)}}{a+b\tan(e+fx)}\,dx$

Optimal. Leaf size=324

$$-\frac{\sqrt{b}\sqrt{d\sec(e+fx)}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{f\left(a^2+b^2\right)^{3/4}\sqrt[4]{\sec^2(e+fx)}}-\frac{\sqrt{b}\sqrt{d\sec(e+fx)}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{f\left(a^2+b^2\right)^{3/4}\sqrt[4]{\sec^2(e+fx)}}+\frac{a\sqrt{-\tan^2(e+fx)}\cot(}{}$$

```
[Out] -arctan((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*b^(1/2)*(d*sec(f*x+e)
)^(1/2)/(a^2+b^2)^(3/4)/f/(sec(f*x+e)^2)^(1/4)-arctanh((sec(f*x+e)^2)^(1/4)
*b^(1/2)/(a^2+b^2)^(1/4))*b^(1/2)*(d*sec(f*x+e))^(1/2)/(a^2+b^2)^(3/4)/f/(s
ec(f*x+e)^2)^(1/4)+a*cot(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1/4),-b/(a^2+b^2
)^(1/2),I)*(d*sec(f*x+e))^(1/2)*(-tan(f*x+e)^2)^(1/2)/(a^2+b^2)/f/(sec(f*x+
e)^2)^(1/4)+a*cot(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1/4),b/(a^2+b^2)^(1/2),
I)*(d*sec(f*x+e))^(1/2)*(-tan(f*x+e)^2)^(1/2)/(a^2+b^2)/f/(sec(f*x+e)^2)^(1
/4)
```

Rubi [A] time = 0.30, antiderivative size = 324, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {3512, 747, 401, 108, 409, 1213, 537, 444, 63, 212, 208, 205}

$$-\frac{\sqrt{b}\sqrt{d\sec(e+fx)}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{f\left(a^2+b^2\right)^{3/4}\sqrt[4]{\sec^2(e+fx)}}-\frac{\sqrt{b}\sqrt{d\sec(e+fx)}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{f\left(a^2+b^2\right)^{3/4}\sqrt[4]{\sec^2(e+fx)}}+\frac{a\sqrt{-\tan^2(e+fx)}\cot(}{}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d*Sec[e + f*x]]/(a + b*Tan[e + f*x]),x]
```

```
[Out] -((Sqrt[b]*ArcTan[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*Sqrt[
d*Sec[e + f*x]])/((a^2 + b^2)^(3/4)*f*(Sec[e + f*x]^2)^(1/4))) - (Sqrt[b]*A
rcTanh[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*Sqrt[d*Sec[e + f
*x]])/((a^2 + b^2)^(3/4)*f*(Sec[e + f*x]^2)^(1/4)) + (a*Cot[e + f*x]*Ellipt
icPi[-(b/Sqrt[a^2 + b^2]), ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*Sqrt[d*Sec[e
 + f*x]]*Sqrt[-Tan[e + f*x]^2])/((a^2 + b^2)*f*(Sec[e + f*x]^2)^(1/4)) + (a
*Cot[e + f*x]*EllipticPi[b/Sqrt[a^2 + b^2], ArcSin[(Sec[e + f*x]^2)^(1/4)],
 -1]*Sqrt[d*Sec[e + f*x]]*Sqrt[-Tan[e + f*x]^2])/((a^2 + b^2)*f*(Sec[e + f*
x]^2)^(1/4))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 108

```
Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(
3/4)), x_Symbol] :> Dist[-4, Subst[Int[1/((b*e - a*f - b*x^4)*Sqrt[c - (d*e
)/f + (d*x^4)/f]), x], x, (e + f*x)^(1/4)], x] /; FreeQ[{a, b, c, d, e, f},
 x] && GtQ[-(f/(d*e - c*f)), 0]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^4)^(-1), x_Symbol] :> With[{r = Numerator[Rt[-(a/b),
 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[r/(2*a), Int[1/(r - s*x^2), x],
 x] + Dist[r/(2*a), Int[1/(r + s*x^2), x], x]] /; FreeQ[{a, b}, x] &&  !GtQ
[a/b, 0]
```

Rule 401

```
Int[1/(((a_) + (b_.)*(x_)^2)^(3/4)*((c_) + (d_.)*(x_)^2)), x_Symbol] :> Dis
t[Sqrt[-((b*x^2)/a)]/(2*x), Subst[Int[1/(Sqrt[-((b*x)/a)]*(a + b*x)^(3/4)*(
c + d*x)), x], x, x^2], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 409

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^4]*((c_) + (d_.)*(x_)^4)), x_Symbol] :> Dist[
1/(2*c), Int[1/(Sqrt[a + b*x^4]*(1 - Rt[-(d/c), 2]*x^2)), x], x] + Dist[1/(
2*c), Int[1/(Sqrt[a + b*x^4]*(1 + Rt[-(d/c), 2]*x^2)), x], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] &&  !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] &&  !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 747

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(3/4)), x_Symbol] :> Dist[
d, Int[1/((d^2 - e^2*x^2)*(a + c*x^2)^(3/4)), x], x] - Dist[e, Int[x/((d^2
- e^2*x^2)*(a + c*x^2)^(3/4)), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^
2 + a*e^2, 0]
```

Rule 1213

```
Int[1/(((d_) + (e_.)*(x_)^2)*Sqrt[(a_) + (c_.)*(x_)^4]), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[Sqrt[-c], Int[1/((d + e*x^2)*Sqrt[q + c*x^2]*Sqrt
[q - c*x^2]), x], x]] /; FreeQ[{a, c, d, e}, x] && GtQ[a, 0] && LtQ[c, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] && !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\sqrt{d\sec(e+fx)}}{a+b\tan(e+fx)}\,dx = \frac{\sqrt{d\sec(e+fx)}\,\text{Subst}\left(\int \frac{1}{(a+x)\left(1+\frac{x^2}{b^2}\right)^{3/4}}\,dx, x, b\tan(e+fx)\right)}{bf\sqrt[4]{\sec^2(e+fx)}}$$

$$= -\frac{\sqrt{d\sec(e+fx)}\,\text{Subst}\left(\int \frac{x}{\left(a^2-x^2\right)\left(1+\frac{x^2}{b^2}\right)^{3/4}}\,dx, x, b\tan(e+fx)\right)}{bf\sqrt[4]{\sec^2(e+fx)}} + \frac{\left(a\sqrt{d\sec(e+fx)}\right)\text{Su}}{}$$

$$= -\frac{\sqrt{d\sec(e+fx)}\,\text{Subst}\left(\int \frac{1}{\left(a^2-x\right)\left(1+\frac{x}{b^2}\right)^{3/4}}\,dx, x, b^2\tan^2(e+fx)\right)}{2bf\sqrt[4]{\sec^2(e+fx)}} + \frac{\left(a\cot(e+fx)\sqrt{d\,\text{se}}\right.}{}$$

$$= -\frac{\left(2b\sqrt{d\sec(e+fx)}\right)\text{Subst}\left(\int \frac{1}{a^2+b^2-b^2x^4}\,dx, x, \sqrt[4]{\sec^2(e+fx)}\right)}{f\sqrt[4]{\sec^2(e+fx)}} - \frac{\left(2a\cot(e+fx)\sqrt{d\,\text{s}}\right.}{}$$

$$= -\frac{\left(b\sqrt{d\sec(e+fx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt{a^2+b^2}-bx^2}\,dx, x, \sqrt[4]{\sec^2(e+fx)}\right)}{\sqrt{a^2+b^2}\,f\sqrt[4]{\sec^2(e+fx)}} - \frac{\left(b\sqrt{d\sec(e+fx)}\right)\text{S}}{\sqrt{}}$$

$$= -\frac{\sqrt{b}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt{d\sec(e+fx)}}{\left(a^2+b^2\right)^{3/4}f\sqrt[4]{\sec^2(e+fx)}} - \frac{\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt{d\sec(e+f}}{\left(a^2+b^2\right)^{3/4}f\sqrt[4]{\sec^2(e+fx)}}$$

$$= -\frac{\sqrt{b}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt{d\sec(e+fx)}}{\left(a^2+b^2\right)^{3/4}f\sqrt[4]{\sec^2(e+fx)}} - \frac{\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt{d\sec(e+f}}{\left(a^2+b^2\right)^{3/4}f\sqrt[4]{\sec^2(e+fx)}}$$

Mathematica [C] time = 24.41, size = 4648, normalized size = 14.35

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sqrt[d*Sec[e + f*x]]/(a + b*Tan[e + f*x]),x]
```

```
[Out] (-2*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4]*Sqrt[d*Sec[e + f*x]]*(Cos[(e + f*
x)/2]^2*Sec[e + f*x])^(3/2)*(-1 + Tan[(e + f*x)/2]^2)*(EllipticF[ArcSin[Tan
[(e + f*x)/2]], -1] + (((-2*I)*b*Sqrt[a^2 + b^2]*EllipticF[ArcSin[Sqrt[1 -
I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2] + a*(a - I*b + Sqrt[a^2 + b^2])
*EllipticPi[((1 + I)*(a + I*(-b + Sqrt[a^2 + b^2])))/(a + b - Sqrt[a^2 + b^
2]), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2] + a*(-a +
```

```
I*b + Sqrt[a^2 + b^2])*EllipticPi[((1 + I)*(a - I*(b + Sqrt[a^2 + b^2])))/(
a + b + Sqrt[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sq
rt[2]], 2])*Sqrt[I*Cos[e + f*x] - Sin[e + f*x]]*Sqrt[Cos[e + f*x]*(Cos[e +
f*x] + I*Sin[e + f*x])]*(I + Tan[(e + f*x)/2])^2)/(Sqrt[2]*(a - I*b)*Sqrt[a
^2 + b^2]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4])))/(a*f*Sqrt[Sec[(e + f*x)/
2]^2]*(a + b*Tan[e + f*x])*((-2*Sqrt[Sec[(e + f*x)/2]^2]*Sqrt[Cos[e + f*x]*
Sec[(e + f*x)/2]^4]*(Cos[(e + f*x)/2]^2*Sec[e + f*x])^(3/2)*Tan[(e + f*x)/2
]*(EllipticF[ArcSin[Tan[(e + f*x)/2]], -1] + (((-2*I)*b*Sqrt[a^2 + b^2]*Ell
ipticF[ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2] + a*(a -
 I*b + Sqrt[a^2 + b^2])*EllipticPi[((1 + I)*(a + I*(-b + Sqrt[a^2 + b^2])))
/(a + b - Sqrt[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/
Sqrt[2]], 2] + a*(-a + I*b + Sqrt[a^2 + b^2])*EllipticPi[((1 + I)*(a - I*(b
 + Sqrt[a^2 + b^2])))/(a + b + Sqrt[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e +
f*x] + Sin[e + f*x]]/Sqrt[2]], 2])*Sqrt[I*Cos[e + f*x] - Sin[e + f*x]]*Sqrt
[Cos[e + f*x]*(Cos[e + f*x] + I*Sin[e + f*x])]*(I + Tan[(e + f*x)/2])^2)/(S
qrt[2]*(a - I*b)*Sqrt[a^2 + b^2]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4])))/a
 + (Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4]*(Cos[(e + f*x)/2]^2*Sec[e + f*x])
^(3/2)*Tan[(e + f*x)/2]*(-1 + Tan[(e + f*x)/2]^2)*(EllipticF[ArcSin[Tan[(e
+ f*x)/2]], -1] + (((-2*I)*b*Sqrt[a^2 + b^2]*EllipticF[ArcSin[Sqrt[1 - I*Co
s[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2] + a*(a - I*b + Sqrt[a^2 + b^2])*Ell
ipticPi[((1 + I)*(a + I*(-b + Sqrt[a^2 + b^2])))/(a + b - Sqrt[a^2 + b^2]),
 ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2] + a*(-a + I*b
+ Sqrt[a^2 + b^2])*EllipticPi[((1 + I)*(a - I*(b + Sqrt[a^2 + b^2])))/(a +
b + Sqrt[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2
]], 2])*Sqrt[I*Cos[e + f*x] - Sin[e + f*x]]*Sqrt[Cos[e + f*x]*(Cos[e + f*x]
 + I*Sin[e + f*x])]*(I + Tan[(e + f*x)/2])^2)/(Sqrt[2]*(a - I*b)*Sqrt[a^2 +
 b^2]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4])))/(a*Sqrt[Sec[(e + f*x)/2]^2])
 - ((Cos[(e + f*x)/2]^2*Sec[e + f*x])^(3/2)*(-(Sec[(e + f*x)/2]^4*Sin[e + f
*x]) + 2*Cos[e + f*x]*Sec[(e + f*x)/2]^4*Tan[(e + f*x)/2])*(-1 + Tan[(e + f
*x)/2]^2)*(EllipticF[ArcSin[Tan[(e + f*x)/2]], -1] + (((-2*I)*b*Sqrt[a^2 +
b^2]*EllipticF[ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2]
+ a*(a - I*b + Sqrt[a^2 + b^2])*EllipticPi[((1 + I)*(a + I*(-b + Sqrt[a^2 +
 b^2])))/(a + b - Sqrt[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e
+ f*x]]/Sqrt[2]], 2] + a*(-a + I*b + Sqrt[a^2 + b^2])*EllipticPi[((1 + I)*(
a - I*(b + Sqrt[a^2 + b^2])))/(a + b + Sqrt[a^2 + b^2]), ArcSin[Sqrt[1 - I*
Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2])*Sqrt[I*Cos[e + f*x] - Sin[e + f*
x]]*Sqrt[Cos[e + f*x]*(Cos[e + f*x] + I*Sin[e + f*x])]*(I + Tan[(e + f*x)/2
])^2)/(Sqrt[2]*(a - I*b)*Sqrt[a^2 + b^2]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]
^4])))/(a*Sqrt[Sec[(e + f*x)/2]^2]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4]) -
 (2*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4]*(Cos[(e + f*x)/2]^2*Sec[e + f*x])
^(3/2)*(-1 + Tan[(e + f*x)/2]^2)*((((-2*I)*b*Sqrt[a^2 + b^2]*EllipticF[ArcS
in[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2] + a*(a - I*b + Sqrt
[a^2 + b^2])*EllipticPi[((1 + I)*(a + I*(-b + Sqrt[a^2 + b^2])))/(a + b - S
qrt[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2
] + a*(-a + I*b + Sqrt[a^2 + b^2])*EllipticPi[((1 + I)*(a - I*(b + Sqrt[a^2
 + b^2])))/(a + b + Sqrt[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[
e + f*x]]/Sqrt[2]], 2])*Sec[(e + f*x)/2]^2*Sqrt[I*Cos[e + f*x] - Sin[e + f*
x]]*Sqrt[Cos[e + f*x]*(Cos[e + f*x] + I*Sin[e + f*x])]*(I + Tan[(e + f*x)/2
]))/(Sqrt[2]*(a - I*b)*Sqrt[a^2 + b^2]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4
]) + (((-2*I)*b*Sqrt[a^2 + b^2]*EllipticF[ArcSin[Sqrt[1 - I*Cos[e + f*x] +
Sin[e + f*x]]/Sqrt[2]], 2] + a*(a - I*b + Sqrt[a^2 + b^2])*EllipticPi[((1 +
 I)*(a + I*(-b + Sqrt[a^2 + b^2])))/(a + b - Sqrt[a^2 + b^2]), ArcSin[Sqrt[
1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2] + a*(-a + I*b + Sqrt[a^2 +
b^2])*EllipticPi[((1 + I)*(a - I*(b + Sqrt[a^2 + b^2])))/(a + b + Sqrt[a^2
+ b^2]), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2])*(-Cos
[e + f*x] - I*Sin[e + f*x])*Sqrt[Cos[e + f*x]*(Cos[e + f*x] + I*Sin[e + f*x
])]*(I + Tan[(e + f*x)/2])^2)/(2*Sqrt[2]*(a - I*b)*Sqrt[a^2 + b^2]*Sqrt[Cos
[e + f*x]*Sec[(e + f*x)/2]^4]*Sqrt[I*Cos[e + f*x] - Sin[e + f*x]]) + (((-2*
I)*b*Sqrt[a^2 + b^2]*EllipticF[ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x
```

```
]]/Sqrt[2]], 2] + a*(a - I*b + Sqrt[a^2 + b^2])*EllipticPi[((1 + I)*(a + I*
(-b + Sqrt[a^2 + b^2])))/(a + b - Sqrt[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e
 + f*x] + Sin[e + f*x]]/Sqrt[2]], 2] + a*(-a + I*b + Sqrt[a^2 + b^2])*Ellip
ticPi[((1 + I)*(a - I*(b + Sqrt[a^2 + b^2])))/(a + b + Sqrt[a^2 + b^2]), Ar
cSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2])*Sqrt[I*Cos[e + f
*x] - Sin[e + f*x]]*(Cos[e + f*x]*(I*Cos[e + f*x] - Sin[e + f*x]) - (Cos[e
+ f*x] + I*Sin[e + f*x])*Sin[e + f*x])*(I + Tan[(e + f*x)/2])^2)/(2*Sqrt[2]
*(a - I*b)*Sqrt[a^2 + b^2]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4]*Sqrt[Cos[e
 + f*x]*(Cos[e + f*x] + I*Sin[e + f*x])]) + (Sqrt[I*Cos[e + f*x] - Sin[e +
f*x]]*Sqrt[Cos[e + f*x]*(Cos[e + f*x] + I*Sin[e + f*x])]*(((-I)*b*Sqrt[a^2
+ b^2]*(Cos[e + f*x] + I*Sin[e + f*x]))/(Sqrt[2]*Sqrt[1 + (-1 + I*Cos[e + f
*x] - Sin[e + f*x])/2]*Sqrt[I*Cos[e + f*x] - Sin[e + f*x]]*Sqrt[1 - I*Cos[e
 + f*x] + Sin[e + f*x]]) + (a*(a - I*b + Sqrt[a^2 + b^2])*(Cos[e + f*x] + I
*Sin[e + f*x]))/(2*Sqrt[2]*Sqrt[1 + (-1 + I*Cos[e + f*x] - Sin[e + f*x])/2]
*Sqrt[I*Cos[e + f*x] - Sin[e + f*x]]*Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]
]*(1 - ((1/2 + I/2)*(a + I*(-b + Sqrt[a^2 + b^2]))*(1 - I*Cos[e + f*x] + Si
n[e + f*x]))/(a + b - Sqrt[a^2 + b^2]))) + (a*(-a + I*b + Sqrt[a^2 + b^2])*
(Cos[e + f*x] + I*Sin[e + f*x]))/(2*Sqrt[2]*Sqrt[1 + (-1 + I*Cos[e + f*x] -
 Sin[e + f*x])/2]*Sqrt[I*Cos[e + f*x] - Sin[e + f*x]]*Sqrt[1 - I*Cos[e + f*
x] + Sin[e + f*x]]*(1 - ((1/2 + I/2)*(a - I*(b + Sqrt[a^2 + b^2]))*(1 - I*C
os[e + f*x] + Sin[e + f*x]))/(a + b + Sqrt[a^2 + b^2]))))*(I + Tan[(e + f*x
)/2])^2)/(Sqrt[2]*(a - I*b)*Sqrt[a^2 + b^2]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)
/2]^4]) - (((-2*I)*b*Sqrt[a^2 + b^2]*EllipticF[ArcSin[Sqrt[1 - I*Cos[e + f*
x] + Sin[e + f*x]]/Sqrt[2]], 2] + a*(a - I*b + Sqrt[a^2 + b^2])*EllipticPi[
((1 + I)*(a + I*(-b + Sqrt[a^2 + b^2])))/(a + b - Sqrt[a^2 + b^2]), ArcSin[
Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2] + a*(-a + I*b + Sqrt[a
^2 + b^2])*EllipticPi[((1 + I)*(a - I*(b + Sqrt[a^2 + b^2])))/(a + b + Sqrt
[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2])*
Sqrt[I*Cos[e + f*x] - Sin[e + f*x]]*Sqrt[Cos[e + f*x]*(Cos[e + f*x] + I*Sin
[e + f*x])]*(I + Tan[(e + f*x)/2])^2*(-(Sec[(e + f*x)/2]^4*Sin[e + f*x]) +
2*Cos[e + f*x]*Sec[(e + f*x)/2]^4*Tan[(e + f*x)/2]))/(2*Sqrt[2]*(a - I*b)*S
qrt[a^2 + b^2]*(Cos[e + f*x]*Sec[(e + f*x)/2]^4)^(3/2)) + Sec[(e + f*x)/2]^
2/(2*Sqrt[1 - Tan[(e + f*x)/2]^2]*Sqrt[1 + Tan[(e + f*x)/2]^2])))/(a*Sqrt[S
ec[(e + f*x)/2]^2]) - (3*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4]*Sqrt[Cos[(e
+ f*x)/2]^2*Sec[e + f*x]]*(-1 + Tan[(e + f*x)/2]^2)*(EllipticF[ArcSin[Tan[(
e + f*x)/2]], -1] + (((-2*I)*b*Sqrt[a^2 + b^2]*EllipticF[ArcSin[Sqrt[1 - I*
Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2] + a*(a - I*b + Sqrt[a^2 + b^2])*E
llipticPi[((1 + I)*(a + I*(-b + Sqrt[a^2 + b^2])))/(a + b - Sqrt[a^2 + b^2]
), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2] + a*(-a + I*
b + Sqrt[a^2 + b^2])*EllipticPi[((1 + I)*(a - I*(b + Sqrt[a^2 + b^2])))/(a
+ b + Sqrt[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt
[2]], 2])*Sqrt[I*Cos[e + f*x] - Sin[e + f*x]]*Sqrt[Cos[e + f*x]*(Cos[e + f*
x] + I*Sin[e + f*x])]*(I + Tan[(e + f*x)/2])^2)/(Sqrt[2]*(a - I*b)*Sqrt[a^2
 + b^2]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4]))*(-(Cos[(e + f*x)/2]*Sec[e +
 f*x]*Sin[(e + f*x)/2]) + Cos[(e + f*x)/2]^2*Sec[e + f*x]*Tan[e + f*x]))/(a
*Sqrt[Sec[(e + f*x)/2]^2])))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e)),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d \sec\left(fx+e\right)}}{b \tan\left(fx+e\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e)),x, algorithm="giac")

[Out] integrate(sqrt(d*sec(f*x + e))/(b*tan(f*x + e) + a), x)

maple [B] time = 1.42, size = 3131, normalized size = 9.66

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e)),x)

[Out] 1/2/f*(d/cos(f*x+e))^(1/2)*(1+cos(f*x+e))^2*(-1+cos(f*x+e))*(4*I*b*a^3*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticPi(I*(-1+cos(f*x+e))/sin(f*x+e),-1/(b+(a^2+b^2)^(1/2))^2*a^2,I)*(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)*(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)*(a^2+b^2)^(1/2)-4*I*b*a^3*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*EllipticPi(I*(-1+cos(f*x+e))/sin(f*x+e),-1/(-b+(a^2+b^2)^(1/2))^2*a^2,I)*(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)*(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)*(a^2+b^2)^(1/2)-4*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)*a^5-4*I*(1/(1+cos(f*x+e)))^(1/2)*(cos(f*x+e)/(1+cos(f*x+e)))^(1/2)*(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)*EllipticF(I*(-1+cos(f*x+e))/sin(f*x+e),I)*(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)*a^3*b^2-(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*ln(2)*(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)*(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)*a^4*b-(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*ln(-(2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)^2-cos(f*x+e)^2-2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)+2*cos(f*x+e)-1)/sin(f*x+e)^2)*(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)*(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)*a^4*b+(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)*(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)*ln(-2*(2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*cos(f*x+e)^2-cos(f*x+e)^2-2*(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)+2*cos(f*x+e)-1)/sin(f*x+e)^2)*a^4*b+(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)*arctanh(1/2*(-1+cos(f*x+e))*(cos(f*x+e)*(a^2+b^2)^(1/2)*b-cos(f*x+e)*a^2-cos(f*x+e)*b^2-b*(a^2+b^2)^(1/2)+b^2)/sin(f*x+e)^2/(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)/(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)/a^2)*(a^2+b^2)^(3/2)*b^2-(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)*arctanh(1/2*(-1+cos(f*x+e))*(cos(f*x+e)*(a^2+b^2)^(1/2)*b-cos(f*x+e)*a^2-cos(f*x+e)*b^2-b*(a^2+b^2)^(1/2)+b^2)/sin(f*x+e)^2/(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)/(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)/a^2)*(a^2+b^2)^(1/2)*b^4-(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)*arctanh(1/2*(-1+cos(f*x+e))*(cos(f*x+e)*(a^2+b^2)^(1/2)*b-cos(f*x+e)*a^2-cos(f*x+e)*b^2-b*(a^2+b^2)^(1/2)+b^2)/sin(f*x+e)^2/(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)/(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)/a^2)*a^4*b-(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)*arctanh(1/2*(-1+cos(f*x+e))*(cos(f*x+e)*(a^2+b^2)^(1/2)*b-cos(f*x+e)*a^2-cos(f*x+e)*b^2-b*(a^2+b^2)^(1/2)+b^2)/sin(f*x+e)^2/(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)/(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)/a^2)*a^2*b^3+(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*arctanh(1/2*(-

```
1+cos(f*x+e))*(cos(f*x+e)*(a^2+b^2)^(1/2)*b+cos(f*x+e)*a^2+cos(f*x+e)*b^2-b
*(a^2+b^2)^(1/2)-b^2)/sin(f*x+e)^2/(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)/(b*
((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)/a^2)*(
-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)*(a^
2+b^2)^(3/2)*b^2-(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*arctanh(1/2*(-1+cos(f
*x+e))*(cos(f*x+e)*(a^2+b^2)^(1/2)*b+cos(f*x+e)*a^2+cos(f*x+e)*b^2-b*(a^2+b
^2)^(1/2)-b^2)/sin(f*x+e)^2/(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)/(b*((a^2+b
^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)/a^2)*(-b*((a^
2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)*(a^2+b^2)^
(1/2)*b^4+(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)*arctanh(1/2*(-1+cos(f*x+e))*
(cos(f*x+e)*(a^2+b^2)^(1/2)*b+cos(f*x+e)*a^2+cos(f*x+e)*b^2-b*(a^2+b^2)^(1/
2)-b^2)/sin(f*x+e)^2/(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)/(b*((a^2+b^2)^(1/
2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)/a^2)*(-b*((a^2+b^2)^
(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)*a^4*b+(-cos(f*x+e
)/(1+cos(f*x+e))^2)^(1/2)*arctanh(1/2*(-1+cos(f*x+e))*(cos(f*x+e)*(a^2+b^2)
^(1/2)*b+cos(f*x+e)*a^2+cos(f*x+e)*b^2-b*(a^2+b^2)^(1/2)-b^2)/sin(f*x+e)^2/
(-cos(f*x+e)/(1+cos(f*x+e))^2)^(1/2)/(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1
/2)*b^2+2*a^2*b+2*b^3)/a^4)^(1/2)/a^2)*(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)
^(1/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)*a^2*b^3)/sin(f*x+e)^2/(a^2+b^2)/(b+(a^
2+b^2)^(1/2))/a^2/(b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1/2)*b^2+2*a^2*b+2*b
^3)/a^4)^(1/2)/(-b+(a^2+b^2)^(1/2))/(-b*((a^2+b^2)^(1/2)*a^2+2*(a^2+b^2)^(1
/2)*b^2-2*a^2*b-2*b^3)/a^4)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d \sec\left(fx+e\right)}}{b \tan\left(fx+e\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e)),x, algorithm="maxima")
[Out] integrate(sqrt(d*sec(f*x + e))/(b*tan(f*x + e) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\sqrt{\frac{d}{\cos\left(e+f\,x\right)}}}{a+b\,\tan\left(e+f\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(1/2)/(a + b*tan(e + f*x)),x)
[Out] int((d/cos(e + f*x))^(1/2)/(a + b*tan(e + f*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d \sec\left(e+fx\right)}}{a+b \tan\left(e+fx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(1/2)/(a+b*tan(f*x+e)),x)
[Out] Integral(sqrt(d*sec(e + f*x))/(a + b*tan(e + f*x)), x)
```

3.607 $\int \frac{1}{\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))}\,dx$

Optimal. Leaf size=451

$$-\frac{2a\tan(e+fx)}{f\left(a^2+b^2\right)\sqrt{d\sec(e+fx)}}+\frac{2(a\tan(e+fx)+b)}{f\left(a^2+b^2\right)\sqrt{d\sec(e+fx)}}+\frac{2a\sqrt[4]{\sec^2(e+fx)}\,E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)}{f\left(a^2+b^2\right)\sqrt{d\sec(e+fx)}}-\frac{ab\sqrt{\ldots}}{\ldots}$$

```
[Out] b^(3/2)*arctan((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(sec(f*x+e)^2)
^(1/4)/(a^2+b^2)^(5/4)/f/(d*sec(f*x+e))^(1/2)-b^(3/2)*arctanh((sec(f*x+e)^2
)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(sec(f*x+e)^2)^(1/4)/(a^2+b^2)^(5/4)/f/(d*
sec(f*x+e))^(1/2)+2*a*(cos(1/2*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arctan(
tan(f*x+e)))*EllipticE(sin(1/2*arctan(tan(f*x+e))),2^(1/2))*(sec(f*x+e)^2)^
(1/4)/(a^2+b^2)/f/(d*sec(f*x+e))^(1/2)-a*b*cot(f*x+e)*EllipticPi((sec(f*x+e
)^2)^(1/4),-b/(a^2+b^2)^(1/2),I)*(sec(f*x+e)^2)^(1/4)*(-tan(f*x+e)^2)^(1/2)
/(a^2+b^2)^(3/2)/f/(d*sec(f*x+e))^(1/2)+a*b*cot(f*x+e)*EllipticPi((sec(f*x+
e)^2)^(1/4),b/(a^2+b^2)^(1/2),I)*(sec(f*x+e)^2)^(1/4)*(-tan(f*x+e)^2)^(1/2)
/(a^2+b^2)^(3/2)/f/(d*sec(f*x+e))^(1/2)-2*a*tan(f*x+e)/(a^2+b^2)/f/(d*sec(f
*x+e))^(1/2)+2*(b+a*tan(f*x+e))/(a^2+b^2)/f/(d*sec(f*x+e))^(1/2)
```

Rubi [A] time = 0.42, antiderivative size = 451, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 15, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {3512, 741, 844, 227, 196, 746, 399, 490, 1213, 537, 444, 63, 298, 205, 208}

$$\frac{b^{3/2}\sqrt[4]{\sec^2(e+fx)}\,\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{f\left(a^2+b^2\right)^{5/4}\sqrt{d\sec(e+fx)}}-\frac{b^{3/2}\sqrt[4]{\sec^2(e+fx)}\,\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{f\left(a^2+b^2\right)^{5/4}\sqrt{d\sec(e+fx)}}-\frac{2a\tan(e+fx)}{f\left(a^2+b^2\right)\sqrt{d\sec(e+\ldots}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x])),x]
```

```
[Out] (b^(3/2)*ArcTan[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*(Sec[e
+ f*x]^2)^(1/4))/((a^2 + b^2)^(5/4)*f*Sqrt[d*Sec[e + f*x]]) - (b^(3/2)*ArcT
anh[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*(Sec[e + f*x]^2)^(1
/4))/((a^2 + b^2)^(5/4)*f*Sqrt[d*Sec[e + f*x]]) + (2*a*EllipticE[ArcTan[Tan
[e + f*x]]/2, 2]*(Sec[e + f*x]^2)^(1/4))/((a^2 + b^2)*f*Sqrt[d*Sec[e + f*x]
]) - (2*a*Tan[e + f*x])/((a^2 + b^2)*f*Sqrt[d*Sec[e + f*x]]) - (a*b*Cot[e +
 f*x]*EllipticPi[-(b/Sqrt[a^2 + b^2]), ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*
(Sec[e + f*x]^2)^(1/4)*Sqrt[-Tan[e + f*x]^2])/((a^2 + b^2)^(3/2)*f*Sqrt[d*S
ec[e + f*x]]) + (a*b*Cot[e + f*x]*EllipticPi[b/Sqrt[a^2 + b^2], ArcSin[(Sec
[e + f*x]^2)^(1/4)], -1]*(Sec[e + f*x]^2)^(1/4)*Sqrt[-Tan[e + f*x]^2])/((a^
2 + b^2)^(3/2)*f*Sqrt[d*Sec[e + f*x]]) + (2*(b + a*Tan[e + f*x]))/((a^2 + b
^2)*f*Sqrt[d*Sec[e + f*x]])
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 196

```
Int[((a_) + (b_.)*(x_)^2)^(-5/4), x_Symbol] :> Simp[(2*EllipticE[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(5/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
```

```
, 0] && PosQ[b/a]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 227

```
Int[((a_) + (b_.)*(x_)^2)^(-1/4), x_Symbol] :> Simp[(2*x)/(a + b*x^2)^(1/4)
, x] - Dist[a, Int[1/(a + b*x^2)^(5/4), x], x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 298

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[-(a/b
), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s/(2*b), Int[1/(r + s*x^2), x
], x] - Dist[s/(2*b), Int[1/(r - s*x^2), x], x]] /; FreeQ[{a, b}, x] &&  !G
tQ[a/b, 0]
```

Rule 399

```
Int[1/(((a_) + (b_.)*(x_)^2)^(1/4)*((c_) + (d_.)*(x_)^2)), x_Symbol] :> Dis
t[(2*Sqrt[-((b*x^2)/a)])/x, Subst[Int[x^2/(Sqrt[1 - x^4/a]*(b*c - a*d + d*x
^4)), x], x, (a + b*x^2)^(1/4)], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c -
a*d, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 490

```
Int[(x_)^2/(((a_) + (b_.)*(x_)^4)*Sqrt[(c_) + (d_.)*(x_)^4]), x_Symbol] :>
With[{r = Numerator[Rt[-(a/b), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s
/(2*b), Int[1/((r + s*x^2)*Sqrt[c + d*x^4]), x], x] - Dist[s/(2*b), Int[1/(
(r - s*x^2)*Sqrt[c + d*x^4]), x], x]] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c
- a*d, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] &&  !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] &&  !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 741

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(a*e + c*d*x)*(a + c*x^2)^(p + 1))/(2*a*(p + 1)*(c*d^2
```

```
+ a*e^2)), x] + Dist[1/(2*a*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*Simp[
c*d^2*(2*p + 3) + a*e^2*(m + 2*p + 3) + c*e*d*(m + 2*p + 4)*x, x]*(a + c*x^
2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] &&
 LtQ[p, -1] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 746

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(1/4)), x_Symbol] :> Dist[
d, Int[1/((d^2 - e^2*x^2)*(a + c*x^2)^(1/4)), x], x] - Dist[e, Int[x/((d^2
- e^2*x^2)*(a + c*x^2)^(1/4)), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^
2 + a*e^2, 0]
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 1213

```
Int[1/(((d_) + (e_.)*(x_)^2)*Sqrt[(a_) + (c_.)*(x_)^4]), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[Sqrt[-c], Int[1/((d + e*x^2)*Sqrt[q + c*x^2]*Sqrt
[q - c*x^2]), x], x]] /; FreeQ[{a, c, d, e}, x] && GtQ[a, 0] && LtQ[c, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{1}{\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))}\,dx = \frac{\sqrt[4]{\sec^2(e+fx)}\ \text{Subst}\left(\int \frac{1}{(a+x)\left(1+\frac{x^2}{b^2}\right)^{5/4}}\,dx, x, b\tan(e+fx)\right)}{bf\sqrt{d\sec(e+fx)}}$$

$$= \frac{2(b+a\tan(e+fx))}{(a^2+b^2)\,f\sqrt{d\sec(e+fx)}} - \frac{\left(2b\sqrt[4]{\sec^2(e+fx)}\right)\text{Subst}\left(\int \frac{\frac{1}{2}\left(-1+\frac{a^2}{b^2}\right)+\ldots}{(a+x)\sqrt[4]{1+\frac{x}{b}\ldots}}\ldots\right.}{(a^2+b^2)\,f\sqrt{d\sec(e+\ldots}}$$

$$= \frac{2(b+a\tan(e+fx))}{(a^2+b^2)\,f\sqrt{d\sec(e+fx)}} - \frac{\left(a\sqrt[4]{\sec^2(e+fx)}\right)\text{Subst}\left(\int \frac{1}{\sqrt[4]{1+\frac{x^2}{b^2}}}\,dx,\ldots\right.}{b\,(a^2+b^2)\,f\sqrt{d\sec(e+f\ldots}}$$

$$= -\frac{2a\tan(e+fx)}{(a^2+b^2)\,f\sqrt{d\sec(e+fx)}} + \frac{2(b+a\tan(e+fx))}{(a^2+b^2)\,f\sqrt{d\sec(e+fx)}} + \frac{\left(a\sqrt[4]{\sec^2\ldots}\right.}{\ldots}$$

$$= \frac{2aE\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt[4]{\sec^2(e+fx)}}{(a^2+b^2)\,f\sqrt{d\sec(e+fx)}} - \frac{2a\tan(e+fx)}{(a^2+b^2)\,f\sqrt{d\sec(e\ldots}}$$

$$= \frac{2aE\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt[4]{\sec^2(e+fx)}}{(a^2+b^2)\,f\sqrt{d\sec(e+fx)}} - \frac{2a\tan(e+fx)}{(a^2+b^2)\,f\sqrt{d\sec(e\ldots}}$$

$$= \frac{2aE\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt[4]{\sec^2(e+fx)}}{(a^2+b^2)\,f\sqrt{d\sec(e+fx)}} - \frac{2a\tan(e+fx)}{(a^2+b^2)\,f\sqrt{d\sec(e\ldots}}$$

$$= \frac{b^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt[4]{\sec^2(e+fx)}}{(a^2+b^2)^{5/4}\,f\sqrt{d\sec(e+fx)}} - \frac{b^{3/2}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx\ldots}}{\sqrt[4]{a^2+b^2}}\right.}{(a^2+b^2)^{5/4}\,f\sqrt{d\,s\ldots}}$$

Mathematica [C] time = 31.11, size = 4693, normalized size = 10.41

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/(Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x])),x]
```

```
[Out] (-2*Sec[e + f*x]^(3/2)*(Cos[(e + f*x)/2]^2*Sec[e + f*x])^(3/2)*(a*Cos[e + f
*x] + b*Sin[e + f*x])*(Sqrt[Sec[e + f*x]]/(2*(a*Cos[e + f*x] + b*Sin[e + f*
x])) + (Cos[2*(e + f*x)]*Sqrt[Sec[e + f*x]])/(2*(a*Cos[e + f*x] + b*Sin[e +
 f*x])))*(-1 + Tan[(e + f*x)/2]^2)^2*(-((a*Sqrt[(1 + Cos[e + f*x])^(-1)]*El
lipticE[ArcSin[Tan[(e + f*x)/2]], -1])/Sqrt[Cos[e + f*x]/(1 + Cos[e + f*x])
]) + ((a^2 + b^2)*Sqrt[(1 + Cos[e + f*x])^(-1)]*EllipticF[ArcSin[Tan[(e + f
*x)/2]], -1])/(a*Sqrt[Cos[e + f*x]/(1 + Cos[e + f*x])]) + (-2*Sqrt[2]*b^2*S
qrt[a^2 + b^2]*EllipticF[ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqr
t[2]], 2]*Sqrt[I*Cos[e + f*x] - Sin[e + f*x]] + a*(b*(a + I*b + Sqrt[a^2 +
b^2])*EllipticPi[((1 + I)*(a + I*(-b + Sqrt[a^2 + b^2])))/(a + b - Sqrt[a^2
```

+ b^2]), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2]*Sqrt[
(2*I)*Cos[e + f*x] - 2*Sin[e + f*x]] + b*(-a - I*b + Sqrt[a^2 + b^2])*Ellip
ticPi[((1 + I)*(a - I*(b + Sqrt[a^2 + b^2])))/(a + b + Sqrt[a^2 + b^2]), Ar
cSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2]*Sqrt[(2*I)*Cos[e
+ f*x] - 2*Sin[e + f*x]] - 2*Sqrt[a^2 + b^2]*Sqrt[Cos[e + f*x]*(Cos[e + f*x
] + I*Sin[e + f*x])]*(b + a*Tan[(e + f*x)/2])))/(2*a*Sqrt[a^2 + b^2]*Sqrt[C
os[e + f*x]*(Cos[e + f*x] + I*Sin[e + f*x])])))/((a^2 + b^2)*f*Sqrt[Sec[(e
+ f*x)/2]^2]*Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x])*((-4*Sqrt[Sec[(e + f
x)/2]^2](Cos[(e + f*x)/2]^2*Sec[e + f*x])^(3/2)*Tan[(e + f*x)/2]*(-1 + Ta
n[(e + f*x)/2]^2)*(-((a*Sqrt[(1 + Cos[e + f*x])^(-1)]*EllipticE[ArcSin[Tan[
(e + f*x)/2]], -1])/Sqrt[Cos[e + f*x]/(1 + Cos[e + f*x])]) + ((a^2 + b^2)*S
qrt[(1 + Cos[e + f*x])^(-1)]*EllipticF[ArcSin[Tan[(e + f*x)/2]], -1])/(a*Sq
rt[Cos[e + f*x]/(1 + Cos[e + f*x])]) + (-2*Sqrt[2]*b^2*Sqrt[a^2 + b^2]*Elli
pticF[ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2]*Sqrt[I*Co
s[e + f*x] - Sin[e + f*x]] + a*(b*(a + I*b + Sqrt[a^2 + b^2])*EllipticPi[((
1 + I)*(a + I*(-b + Sqrt[a^2 + b^2])))/(a + b - Sqrt[a^2 + b^2]), ArcSin[Sq
rt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2]*Sqrt[(2*I)*Cos[e + f*x]
- 2*Sin[e + f*x]] + b*(-a - I*b + Sqrt[a^2 + b^2])*EllipticPi[((1 + I)*(a -
I*(b + Sqrt[a^2 + b^2])))/(a + b + Sqrt[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos
[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2]*Sqrt[(2*I)*Cos[e + f*x] - 2*Sin[e +
f*x]] - 2*Sqrt[a^2 + b^2]*Sqrt[Cos[e + f*x]*(Cos[e + f*x] + I*Sin[e + f*x])
]*(b + a*Tan[(e + f*x)/2])))/(2*a*Sqrt[a^2 + b^2]*Sqrt[Cos[e + f*x]*(Cos[e
+ f*x] + I*Sin[e + f*x])])))/(a^2 + b^2) + ((Cos[(e + f*x)/2]^2*Sec[e + f*x
])^(3/2)*Tan[(e + f*x)/2]*(-1 + Tan[(e + f*x)/2]^2)^2*(-((a*Sqrt[(1 + Cos[e
+ f*x])^(-1)]*EllipticE[ArcSin[Tan[(e + f*x)/2]], -1])/Sqrt[Cos[e + f*x]/(
1 + Cos[e + f*x])]) + ((a^2 + b^2)*Sqrt[(1 + Cos[e + f*x])^(-1)]*EllipticF[
ArcSin[Tan[(e + f*x)/2]], -1])/(a*Sqrt[Cos[e + f*x]/(1 + Cos[e + f*x])]) +
(-2*Sqrt[2]*b^2*Sqrt[a^2 + b^2]*EllipticF[ArcSin[Sqrt[1 - I*Cos[e + f*x] +
Sin[e + f*x]]/Sqrt[2]], 2]*Sqrt[I*Cos[e + f*x] - Sin[e + f*x]] + a*(b*(a +
I*b + Sqrt[a^2 + b^2])*EllipticPi[((1 + I)*(a + I*(-b + Sqrt[a^2 + b^2])))/
(a + b - Sqrt[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/S
qrt[2]], 2]*Sqrt[(2*I)*Cos[e + f*x] - 2*Sin[e + f*x]] + b*(-a - I*b + Sqrt[
a^2 + b^2])*EllipticPi[((1 + I)*(a - I*(b + Sqrt[a^2 + b^2])))/(a + b + Sqr
t[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2]*
Sqrt[(2*I)*Cos[e + f*x] - 2*Sin[e + f*x]] - 2*Sqrt[a^2 + b^2]*Sqrt[Cos[e +
f*x]*(Cos[e + f*x] + I*Sin[e + f*x])]*(b + a*Tan[(e + f*x)/2])))/(2*a*Sqrt[
a^2 + b^2]*Sqrt[Cos[e + f*x]*(Cos[e + f*x] + I*Sin[e + f*x])])))/((a^2 + b^
2)*Sqrt[Sec[(e + f*x)/2]^2]) - (2*(Cos[(e + f*x)/2]^2*Sec[e + f*x])^(3/2)*(
-1 + Tan[(e + f*x)/2]^2)^2*(-1/2*(a*((1 + Cos[e + f*x])^(-1))^(3/2)*Ellipti
cE[ArcSin[Tan[(e + f*x)/2]], -1]*Sin[e + f*x])/Sqrt[Cos[e + f*x]/(1 + Cos[e
+ f*x])] + ((a^2 + b^2)*((1 + Cos[e + f*x])^(-1))^(3/2)*EllipticF[ArcSin[T
an[(e + f*x)/2]], -1]*Sin[e + f*x])/(2*a*Sqrt[Cos[e + f*x]/(1 + Cos[e + f*x
])]) + (a*Sqrt[(1 + Cos[e + f*x])^(-1)]*EllipticE[ArcSin[Tan[(e + f*x)/2]],
-1]*((Cos[e + f*x]*Sin[e + f*x])/(1 + Cos[e + f*x])^2 - Sin[e + f*x]/(1 +
Cos[e + f*x])))/(2*(Cos[e + f*x]/(1 + Cos[e + f*x]))^(3/2)) - ((a^2 + b^2)*
Sqrt[(1 + Cos[e + f*x])^(-1)]*EllipticF[ArcSin[Tan[(e + f*x)/2]], -1]*((Cos
[e + f*x]*Sin[e + f*x])/(1 + Cos[e + f*x])^2 - Sin[e + f*x]/(1 + Cos[e + f*
x])))/(2*a*(Cos[e + f*x]/(1 + Cos[e + f*x]))^(3/2)) + ((a^2 + b^2)*Sqrt[(1
+ Cos[e + f*x])^(-1)]*Sec[(e + f*x)/2]^2)/(2*a*Sqrt[Cos[e + f*x]/(1 + Cos[e
+ f*x])]*Sqrt[1 - Tan[(e + f*x)/2]^2]*Sqrt[1 + Tan[(e + f*x)/2]^2]) - (a*S
qrt[(1 + Cos[e + f*x])^(-1)]*Sec[(e + f*x)/2]^2*Sqrt[1 + Tan[(e + f*x)/2]^2
])/(2*Sqrt[Cos[e + f*x]/(1 + Cos[e + f*x])]*Sqrt[1 - Tan[(e + f*x)/2]^2]) -
((Cos[e + f*x]*(I*Cos[e + f*x] - Sin[e + f*x]) - (Cos[e + f*x] + I*Sin[e +
f*x])*Sin[e + f*x])*(-2*Sqrt[2]*b^2*Sqrt[a^2 + b^2]*EllipticF[ArcSin[Sqrt[
1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2]*Sqrt[I*Cos[e + f*x] - Sin[e
+ f*x]] + a*(b*(a + I*b + Sqrt[a^2 + b^2])*EllipticPi[((1 + I)*(a + I*(-b
+ Sqrt[a^2 + b^2])))/(a + b - Sqrt[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e + f
*x] + Sin[e + f*x]]/Sqrt[2]], 2]*Sqrt[(2*I)*Cos[e + f*x] - 2*Sin[e + f*x]]
+ b*(-a - I*b + Sqrt[a^2 + b^2])*EllipticPi[((1 + I)*(a - I*(b + Sqrt[a^2 +

```
b^2])))/(a + b + Sqrt[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e
+ f*x]]/Sqrt[2]], 2]*Sqrt[(2*I)*Cos[e + f*x] - 2*Sin[e + f*x]] - 2*Sqrt[a^2
 + b^2]*Sqrt[Cos[e + f*x]*(Cos[e + f*x] + I*Sin[e + f*x])]*(b + a*Tan[(e +
f*x)/2]))))/(4*a*Sqrt[a^2 + b^2]*(Cos[e + f*x]*(Cos[e + f*x] + I*Sin[e + f*
x]))^(3/2)) + (-((Sqrt[2]*b^2*Sqrt[a^2 + b^2]*EllipticF[ArcSin[Sqrt[1 - I*C
os[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2]*(-Cos[e + f*x] - I*Sin[e + f*x]))/
Sqrt[I*Cos[e + f*x] - Sin[e + f*x]]) - (b^2*Sqrt[a^2 + b^2]*(Cos[e + f*x] +
 I*Sin[e + f*x]))/(Sqrt[1 + (-1 + I*Cos[e + f*x] - Sin[e + f*x])/2]*Sqrt[1
- I*Cos[e + f*x] + Sin[e + f*x]]) + a*(-(a*Sqrt[a^2 + b^2]*Sec[(e + f*x)/2]
^2*Sqrt[Cos[e + f*x]*(Cos[e + f*x] + I*Sin[e + f*x])]) + (b*(a + I*b + Sqrt
[a^2 + b^2])*EllipticPi[((1 + I)*(a + I*(-b + Sqrt[a^2 + b^2])))/(a + b - S
qrt[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2
]*(-2*Cos[e + f*x] - (2*I)*Sin[e + f*x]))/(2*Sqrt[(2*I)*Cos[e + f*x] - 2*Si
n[e + f*x]]) + (b*(-a - I*b + Sqrt[a^2 + b^2])*EllipticPi[((1 + I)*(a - I*(
b + Sqrt[a^2 + b^2])))/(a + b + Sqrt[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e +
 f*x] + Sin[e + f*x]]/Sqrt[2]], 2]*(-2*Cos[e + f*x] - (2*I)*Sin[e + f*x]))/
(2*Sqrt[(2*I)*Cos[e + f*x] - 2*Sin[e + f*x]]) + (b*(a + I*b + Sqrt[a^2 + b^
2])*Sqrt[(2*I)*Cos[e + f*x] - 2*Sin[e + f*x]]*(Cos[e + f*x] + I*Sin[e + f*x
]))/(2*Sqrt[2]*Sqrt[1 + (-1 + I*Cos[e + f*x] - Sin[e + f*x])/2]*Sqrt[I*Cos[
e + f*x] - Sin[e + f*x]]*Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]*(1 - ((1/2
 + I/2)*(a + I*(-b + Sqrt[a^2 + b^2]))*(1 - I*Cos[e + f*x] + Sin[e + f*x]))
/(a + b - Sqrt[a^2 + b^2]))) + (b*(-a - I*b + Sqrt[a^2 + b^2])*Sqrt[(2*I)*C
os[e + f*x] - 2*Sin[e + f*x]]*(Cos[e + f*x] + I*Sin[e + f*x]))/(2*Sqrt[2]*S
qrt[1 + (-1 + I*Cos[e + f*x] - Sin[e + f*x])/2]*Sqrt[I*Cos[e + f*x] - Sin[e
 + f*x]]*Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]*(1 - ((1/2 + I/2)*(a - I*(
b + Sqrt[a^2 + b^2]))*(1 - I*Cos[e + f*x] + Sin[e + f*x]))/(a + b + Sqrt[a^
2 + b^2]))) - (Sqrt[a^2 + b^2]*(Cos[e + f*x]*(I*Cos[e + f*x] - Sin[e + f*x]
) - (Cos[e + f*x] + I*Sin[e + f*x])*Sin[e + f*x])*(b + a*Tan[(e + f*x)/2]))
/Sqrt[Cos[e + f*x]*(Cos[e + f*x] + I*Sin[e + f*x])]))/(2*a*Sqrt[a^2 + b^2]*
Sqrt[Cos[e + f*x]*(Cos[e + f*x] + I*Sin[e + f*x])])))/((a^2 + b^2)*Sqrt[Sec
[(e + f*x)/2]^2]) - (3*Sqrt[Cos[(e + f*x)/2]^2*Sec[e + f*x]]*(-1 + Tan[(e +
 f*x)/2]^2)^2*(-((a*Sqrt[(1 + Cos[e + f*x])^(-1)]*EllipticE[ArcSin[Tan[(e +
 f*x)/2]], -1])/Sqrt[Cos[e + f*x]/(1 + Cos[e + f*x])]) + ((a^2 + b^2)*Sqrt[
(1 + Cos[e + f*x])^(-1)]*EllipticF[ArcSin[Tan[(e + f*x)/2]], -1])/(a*Sqrt[C
os[e + f*x]/(1 + Cos[e + f*x])]) + (-2*Sqrt[2]*b^2*Sqrt[a^2 + b^2]*Elliptic
F[ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2]*Sqrt[I*Cos[e
+ f*x] - Sin[e + f*x]] + a*(b*(a + I*b + Sqrt[a^2 + b^2])*EllipticPi[((1 +
I)*(a + I*(-b + Sqrt[a^2 + b^2])))/(a + b - Sqrt[a^2 + b^2]), ArcSin[Sqrt[1
 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2]*Sqrt[(2*I)*Cos[e + f*x] - 2*
Sin[e + f*x]] + b*(-a - I*b + Sqrt[a^2 + b^2])*EllipticPi[((1 + I)*(a - I*(
b + Sqrt[a^2 + b^2])))/(a + b + Sqrt[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e +
 f*x] + Sin[e + f*x]]/Sqrt[2]], 2]*Sqrt[(2*I)*Cos[e + f*x] - 2*Sin[e + f*x]
] - 2*Sqrt[a^2 + b^2]*Sqrt[Cos[e + f*x]*(Cos[e + f*x] + I*Sin[e + f*x])]*(b
 + a*Tan[(e + f*x)/2])))/(2*a*Sqrt[a^2 + b^2]*Sqrt[Cos[e + f*x]*(Cos[e + f*
x] + I*Sin[e + f*x])])))*(-(Cos[(e + f*x)/2]*Sec[e + f*x]*Sin[(e + f*x)/2])
+ Cos[(e + f*x)/2]^2*Sec[e + f*x]*Tan[e + f*x]))/((a^2 + b^2)*Sqrt[Sec[(e +
 f*x)/2]^2]))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e)),x, algorithm="fricas")
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{d\sec\left(fx+e\right)}\left(b\tan\left(fx+e\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e)),x, algorithm="giac")
[Out] integrate(1/(sqrt(d*sec(f*x + e))*(b*tan(f*x + e) + a)), x)
```

maple [B] time = 1.62, size = 8825, normalized size = 19.57

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e)),x)
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{d \sec\left(fx+e\right)}\left(b \tan\left(fx+e\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e)),x, algorithm="maxima")
[Out] integrate(1/(sqrt(d*sec(f*x + e))*(b*tan(f*x + e) + a)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{\sqrt{\frac{d}{\cos\left(e+f\,x\right)}}\,\left(a+b\tan\left(e+f\,x\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d/cos(e + f*x))^(1/2)*(a + b*tan(e + f*x))),x)
[Out] int(1/((d/cos(e + f*x))^(1/2)*(a + b*tan(e + f*x))), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{d \sec\left(e+fx\right)}\left(a+b \tan\left(e+fx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))**(1/2)/(a+b*tan(f*x+e)),x)
[Out] Integral(1/(sqrt(d*sec(e + f*x))*(a + b*tan(e + f*x))), x)
```

3.608 $\int \frac{1}{(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))}\,dx$

Optimal. Leaf size=422

$$\frac{2(a\tan(e+fx)+b)}{3f\left(a^2+b^2\right)(d\sec(e+fx))^{3/2}}+\frac{2a\sec^2(e+fx)^{3/4}F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)}{3f\left(a^2+b^2\right)(d\sec(e+fx))^{3/2}}+\frac{ab^2\sqrt{-\tan^2(e+fx)}\cot(e+fx)\,\mathrm{s}}{f\left(a\right.}$$

```
[Out] -b^(5/2)*arctan((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(sec(f*x+e)^2
)^(3/4)/(a^2+b^2)^(7/4)/f/(d*sec(f*x+e))^(3/2)-b^(5/2)*arctanh((sec(f*x+e)^
2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(sec(f*x+e)^2)^(3/4)/(a^2+b^2)^(7/4)/f/(d
*sec(f*x+e))^(3/2)+2/3*a*(cos(1/2*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arct
an(tan(f*x+e)))*EllipticF(sin(1/2*arctan(tan(f*x+e))),2^(1/2))*(sec(f*x+e)^
2)^(3/4)/(a^2+b^2)/f/(d*sec(f*x+e))^(3/2)+a*b^2*cot(f*x+e)*EllipticPi((sec(
f*x+e)^2)^(1/4),-b/(a^2+b^2)^(1/2),I)*(sec(f*x+e)^2)^(3/4)*(-tan(f*x+e)^2)^
(1/2)/(a^2+b^2)^2/f/(d*sec(f*x+e))^(3/2)+a*b^2*cot(f*x+e)*EllipticPi((sec(f
*x+e)^2)^(1/4),b/(a^2+b^2)^(1/2),I)*(sec(f*x+e)^2)^(3/4)*(-tan(f*x+e)^2)^(1
/2)/(a^2+b^2)^2/f/(d*sec(f*x+e))^(3/2)+2/3*(b+a*tan(f*x+e))/(a^2+b^2)/f/(d*
sec(f*x+e))^(3/2)
```

Rubi [A] time = 0.43, antiderivative size = 422, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 15, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {3512, 741, 844, 231, 747, 401, 108, 409, 1213, 537, 444, 63, 212, 208, 205}

$$-\frac{b^{5/2}\sec^2(e+fx)^{3/4}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{f\left(a^2+b^2\right)^{7/4}(d\sec(e+fx))^{3/2}}-\frac{b^{5/2}\sec^2(e+fx)^{3/4}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{f\left(a^2+b^2\right)^{7/4}(d\sec(e+fx))^{3/2}}+\frac{2(a\tan(e+fx)+b}{3f\left(a^2+b^2\right)(d\sec(e+}$$

Antiderivative was successfully verified.

```
[In] Int[1/((d*Sec[e + f*x])^(3/2)*(a + b*Tan[e + f*x])),x]
```

```
[Out] -((b^(5/2)*ArcTan[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*(Sec[
e + f*x]^2)^(3/4))/((a^2 + b^2)^(7/4)*f*(d*Sec[e + f*x])^(3/2))) - (b^(5/2)
*ArcTanh[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*(Sec[e + f*x]^
2)^(3/4))/((a^2 + b^2)^(7/4)*f*(d*Sec[e + f*x])^(3/2)) + (2*a*EllipticF[Arc
Tan[Tan[e + f*x]]/2, 2]*(Sec[e + f*x]^2)^(3/4))/(3*(a^2 + b^2)*f*(d*Sec[e +
 f*x])^(3/2)) + (a*b^2*Cot[e + f*x]*EllipticPi[-(b/Sqrt[a^2 + b^2]), ArcSin
[(Sec[e + f*x]^2)^(1/4)], -1]*(Sec[e + f*x]^2)^(3/4)*Sqrt[-Tan[e + f*x]^2])
/((a^2 + b^2)^2*f*(d*Sec[e + f*x])^(3/2)) + (a*b^2*Cot[e + f*x]*EllipticPi[
b/Sqrt[a^2 + b^2], ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*(Sec[e + f*x]^2)^(3/
4)*Sqrt[-Tan[e + f*x]^2])/((a^2 + b^2)^2*f*(d*Sec[e + f*x])^(3/2)) + (2*(b
+ a*Tan[e + f*x]))/(3*(a^2 + b^2)*f*(d*Sec[e + f*x])^(3/2))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 108

```
Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(
3/4)), x_Symbol] :> Dist[-4, Subst[Int[1/((b*e - a*f - b*x^4)*Sqrt[c - (d*e
)/f + (d*x^4)/f]), x], x, (e + f*x)^(1/4)], x] /; FreeQ[{a, b, c, d, e, f},
```

```
x] && GtQ[-(f/(d*e - c*f)), 0]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^4)^(-1), x_Symbol] :> With[{r = Numerator[Rt[-(a/b),
 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[r/(2*a), Int[1/(r - s*x^2), x],
 x] + Dist[r/(2*a), Int[1/(r + s*x^2), x], x]] /; FreeQ[{a, b}, x] &&  !GtQ
[a/b, 0]
```

Rule 231

```
Int[((a_) + (b_.)*(x_)^2)^(-3/4), x_Symbol] :> Simp[(2*EllipticF[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(3/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 401

```
Int[1/(((a_) + (b_.)*(x_)^2)^(3/4)*((c_) + (d_.)*(x_)^2)), x_Symbol] :> Dis
t[Sqrt[-((b*x^2)/a)]/(2*x), Subst[Int[1/(Sqrt[-((b*x)/a)]*(a + b*x)^(3/4)*(
c + d*x)), x], x, x^2], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 409

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^4]*((c_) + (d_.)*(x_)^4)), x_Symbol] :> Dist[
1/(2*c), Int[1/(Sqrt[a + b*x^4]*(1 - Rt[-(d/c), 2]*x^2)), x], x] + Dist[1/(
2*c), Int[1/(Sqrt[a + b*x^4]*(1 + Rt[-(d/c), 2]*x^2)), x], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] &&  !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] &&  !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 741

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(a*e + c*d*x)*(a + c*x^2)^(p + 1))/(2*a*(p + 1)*(c*d^2
+ a*e^2)), x] + Dist[1/(2*a*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*Simp[
c*d^2*(2*p + 3) + a*e^2*(m + 2*p + 3) + c*e*d*(m + 2*p + 4)*x, x]*(a + c*x^
```

```
2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] &&
 LtQ[p, -1] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 747

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(3/4)), x_Symbol] :> Dist[
d, Int[1/((d^2 - e^2*x^2)*(a + c*x^2)^(3/4)), x], x] - Dist[e, Int[x/((d^2
- e^2*x^2)*(a + c*x^2)^(3/4)), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^
2 + a*e^2, 0]
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 1213

```
Int[1/(((d_) + (e_.)*(x_)^2)*Sqrt[(a_) + (c_.)*(x_)^4]), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[Sqrt[-c], Int[1/((d + e*x^2)*Sqrt[q + c*x^2]*Sqrt
[q - c*x^2]), x], x]] /; FreeQ[{a, c, d, e}, x] && GtQ[a, 0] && LtQ[c, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{1}{(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))}\,dx = \frac{\sec^2(e+fx)^{3/4}\operatorname{Subst}\left(\int \frac{1}{(a+x)\left(1+\frac{x^2}{b^2}\right)^{7/4}}\,dx, x, b\tan(e+fx)\right)}{bf(d\sec(e+fx))^{3/2}}$$

$$= \frac{2(b+a\tan(e+fx))}{3\left(a^2+b^2\right)f(d\sec(e+fx))^{3/2}} - \frac{\left(2b\sec^2(e+fx)^{3/4}\right)\operatorname{Subst}\left(\int \frac{\frac{1}{2}}{(a}\right.}{3\left(a^2+b^2\right)f(d}$$

$$= \frac{2(b+a\tan(e+fx))}{3\left(a^2+b^2\right)f(d\sec(e+fx))^{3/2}} + \frac{\left(a\sec^2(e+fx)^{3/4}\right)\operatorname{Subst}\left(\int \frac{}{(1-}\right.}{3b\left(a^2+b^2\right)f(d\,\mathrm{se}}$$

$$= \frac{2aF\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sec^2(e+fx)^{3/4}}{3\left(a^2+b^2\right)f(d\sec(e+fx))^{3/2}} + \frac{2(b+a\tan}{3\left(a^2+b^2\right)f(d\,\mathrm{s}}$$

$$= \frac{2aF\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sec^2(e+fx)^{3/4}}{3\left(a^2+b^2\right)f(d\sec(e+fx))^{3/2}} + \frac{2(b+a\tan}{3\left(a^2+b^2\right)f(d\,\mathrm{s}}$$

$$= \frac{2aF\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sec^2(e+fx)^{3/4}}{3\left(a^2+b^2\right)f(d\sec(e+fx))^{3/2}} + \frac{2(b+a\tan}{3\left(a^2+b^2\right)f(d\,\mathrm{s}}$$

$$= \frac{2aF\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sec^2(e+fx)^{3/4}}{3\left(a^2+b^2\right)f(d\sec(e+fx))^{3/2}} + \frac{2(b+a\tan}{3\left(a^2+b^2\right)f(d\,\mathrm{s}}$$

$$= -\frac{b^{5/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sec^2(e+fx)^{3/4}}{\left(a^2+b^2\right)^{7/4}f(d\sec(e+fx))^{3/2}} - \frac{b^{5/2}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\mathrm{se}}}{\sqrt[4]{a}}\right.}{\left(a^2+b^2\right)^{7/4}}$$

$$= -\frac{b^{5/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sec^2(e+fx)^{3/4}}{\left(a^2+b^2\right)^{7/4}f(d\sec(e+fx))^{3/2}} - \frac{b^{5/2}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\mathrm{se}}}{\sqrt[4]{a}}\right.}{\left(a^2+b^2\right)^{7/4}}$$

Mathematica [C] time = 27.43, size = 9313, normalized size = 22.07

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/((d*Sec[e + f*x])^(3/2)*(a + b*Tan[e + f*x])),x]
```

```
[Out] Result too large to show
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e)),x, algorithm="fricas")
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(fx+e\right)\right)^{\frac{3}{2}}\left(b\tan\left(fx+e\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e)),x, algorithm="giac")
[Out] integrate(1/((d*sec(f*x + e))^(3/2)*(b*tan(f*x + e) + a)), x)
```

maple [B] time = 1.48, size = 6252, normalized size = 14.82

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e)),x)
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(fx+e\right)\right)^{\frac{3}{2}}\left(b\tan\left(fx+e\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e)),x, algorithm="maxima")
[Out] integrate(1/((d*sec(f*x + e))^(3/2)*(b*tan(f*x + e) + a)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{3/2}\,\left(a+b\,\tan\left(e+f\,x\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d/cos(e + f*x))^(3/2)*(a + b*tan(e + f*x))),x)
[Out] int(1/((d/cos(e + f*x))^(3/2)*(a + b*tan(e + f*x))), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(e+fx\right)\right)^{\frac{3}{2}}\left(a+b\tan\left(e+fx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))**(3/2)/(a+b*tan(f*x+e)),x)
[Out] Integral(1/((d*sec(e + f*x))**(3/2)*(a + b*tan(e + f*x))), x)
```

3.609 $\int \frac{1}{(d\sec(e+fx))^{5/2}(a+b\tan(e+fx))}\,dx$

Optimal. Leaf size=568

$$-\frac{2a\left(3a^2+8b^2\right)\tan(e+fx)}{5d^2f\left(a^2+b^2\right)^2\sqrt{d\sec(e+fx)}}+\frac{2\cos^2(e+fx)(a\tan(e+fx)+b)}{5d^2f\left(a^2+b^2\right)\sqrt{d\sec(e+fx)}}+\frac{2a\left(3a^2+8b^2\right)\sqrt[4]{\sec^2(e+fx)}\,E\left(\frac{1}{2}\tan^{-}\right.}{5d^2f\left(a^2+b^2\right)^2\sqrt{d\sec(e+}}$$

```
[Out] b^(7/2)*arctan((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(sec(f*x+e)^2)
^(1/4)/(a^2+b^2)^(9/4)/d^2/f/(d*sec(f*x+e))^(1/2)-b^(7/2)*arctanh((sec(f*x+
e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(sec(f*x+e)^2)^(1/4)/(a^2+b^2)^(9/4)/d
^2/f/(d*sec(f*x+e))^(1/2)+2/5*a*(3*a^2+8*b^2)*(cos(1/2*arctan(tan(f*x+e)))^
2)^(1/2)/cos(1/2*arctan(tan(f*x+e)))*EllipticE(sin(1/2*arctan(tan(f*x+e))),
2^(1/2))*(sec(f*x+e)^2)^(1/4)/(a^2+b^2)^2/d^2/f/(d*sec(f*x+e))^(1/2)-a*b^3*
cot(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1/4),-b/(a^2+b^2)^(1/2),I)*(sec(f*x+e
)^2)^(1/4)*(-tan(f*x+e)^2)^(1/2)/(a^2+b^2)^(5/2)/d^2/f/(d*sec(f*x+e))^(1/2)
+a*b^3*cot(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1/4),b/(a^2+b^2)^(1/2),I)*(sec
(f*x+e)^2)^(1/4)*(-tan(f*x+e)^2)^(1/2)/(a^2+b^2)^(5/2)/d^2/f/(d*sec(f*x+e))
^(1/2)-2/5*a*(3*a^2+8*b^2)*tan(f*x+e)/(a^2+b^2)^2/d^2/f/(d*sec(f*x+e))^(1/2
)+2/5*cos(f*x+e)^2*(b+a*tan(f*x+e))/(a^2+b^2)/d^2/f/(d*sec(f*x+e))^(1/2)+2/
5*(5*b^3+a*(3*a^2+8*b^2)*tan(f*x+e))/(a^2+b^2)^2/d^2/f/(d*sec(f*x+e))^(1/2)
```

Rubi [A] time = 0.61, antiderivative size = 568, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 16, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.640, Rules used = {3512, 741, 823, 844, 227, 196, 746, 399, 490, 1213, 537, 444, 63, 298, 205, 208}

$$\frac{b^{7/2}\sqrt[4]{\sec^2(e+fx)}\,\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{d^2f\left(a^2+b^2\right)^{9/4}\sqrt{d\sec(e+fx)}}-\frac{b^{7/2}\sqrt[4]{\sec^2(e+fx)}\,\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{d^2f\left(a^2+b^2\right)^{9/4}\sqrt{d\sec(e+fx)}}-\frac{2a\left(3a^2+8b^2\right)\tan(e}{5d^2f\left(a^2+b^2\right)^2\sqrt{d\sec}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((d*Sec[e + f*x])^(5/2)*(a + b*Tan[e + f*x])),x]
```

```
[Out] (b^(7/2)*ArcTan[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*(Sec[e
+ f*x]^2)^(1/4))/((a^2 + b^2)^(9/4)*d^2*f*Sqrt[d*Sec[e + f*x]]) - (b^(7/2)*
ArcTanh[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*(Sec[e + f*x]^2
)^(1/4))/((a^2 + b^2)^(9/4)*d^2*f*Sqrt[d*Sec[e + f*x]]) + (2*a*(3*a^2 + 8*b
^2)*EllipticE[ArcTan[Tan[e + f*x]]/2, 2]*(Sec[e + f*x]^2)^(1/4))/(5*(a^2 +
b^2)^2*d^2*f*Sqrt[d*Sec[e + f*x]]) - (2*a*(3*a^2 + 8*b^2)*Tan[e + f*x])/(5*
(a^2 + b^2)^2*d^2*f*Sqrt[d*Sec[e + f*x]]) - (a*b^3*Cot[e + f*x]*EllipticPi[
-(b/Sqrt[a^2 + b^2]), ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*(Sec[e + f*x]^2)^
(1/4)*Sqrt[-Tan[e + f*x]^2])/((a^2 + b^2)^(5/2)*d^2*f*Sqrt[d*Sec[e + f*x]])
 + (a*b^3*Cot[e + f*x]*EllipticPi[b/Sqrt[a^2 + b^2], ArcSin[(Sec[e + f*x]^2
)^(1/4)], -1]*(Sec[e + f*x]^2)^(1/4)*Sqrt[-Tan[e + f*x]^2])/((a^2 + b^2)^(5
/2)*d^2*f*Sqrt[d*Sec[e + f*x]]) + (2*Cos[e + f*x]^2*(b + a*Tan[e + f*x]))/(
5*(a^2 + b^2)*d^2*f*Sqrt[d*Sec[e + f*x]]) + (2*(5*b^3 + a*(3*a^2 + 8*b^2)*T
an[e + f*x]))/(5*(a^2 + b^2)^2*d^2*f*Sqrt[d*Sec[e + f*x]])
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 196

```
Int[((a_) + (b_.)*(x_)^2)^(-5/4), x_Symbol] :> Simp[(2*EllipticE[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(5/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 227

```
Int[((a_) + (b_.)*(x_)^2)^(-1/4), x_Symbol] :> Simp[(2*x)/(a + b*x^2)^(1/4)
, x] - Dist[a, Int[1/(a + b*x^2)^(5/4), x], x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 298

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[-(a/b
), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s/(2*b), Int[1/(r + s*x^2), x
], x] - Dist[s/(2*b), Int[1/(r - s*x^2), x], x]] /; FreeQ[{a, b}, x] &&  !G
tQ[a/b, 0]
```

Rule 399

```
Int[1/(((a_) + (b_.)*(x_)^2)^(1/4)*((c_) + (d_.)*(x_)^2)), x_Symbol] :> Dis
t[(2*Sqrt[-((b*x^2)/a)])/x, Subst[Int[x^2/(Sqrt[1 - x^4/a]*(b*c - a*d + d*x
^4)), x], x, (a + b*x^2)^(1/4)], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c -
a*d, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 490

```
Int[(x_)^2/(((a_) + (b_.)*(x_)^4)*Sqrt[(c_) + (d_.)*(x_)^4]), x_Symbol] :>
With[{r = Numerator[Rt[-(a/b), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s
/(2*b), Int[1/((r + s*x^2)*Sqrt[c + d*x^4]), x], x] - Dist[s/(2*b), Int[1/(
(r - s*x^2)*Sqrt[c + d*x^4]), x], x]] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c
- a*d, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] &&  !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] &&  !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 741

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(a*e + c*d*x)*(a + c*x^2)^(p + 1))/(2*a*(p + 1)*(c*d^2
+ a*e^2)), x] + Dist[1/(2*a*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*Simp[
c*d^2*(2*p + 3) + a*e^2*(m + 2*p + 3) + c*e*d*(m + 2*p + 4)*x, x]*(a + c*x^
2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] &&
 LtQ[p, -1] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 746

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(1/4)), x_Symbol] :> Dist[
d, Int[1/((d^2 - e^2*x^2)*(a + c*x^2)^(1/4)), x], x] - Dist[e, Int[x/((d^2
- e^2*x^2)*(a + c*x^2)^(1/4)), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^
2 + a*e^2, 0]
```

Rule 823

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_), x_Symbol] :> -Simp[((d + e*x)^(m + 1)*(f*a*c*e - a*g*c*d + c*(c*d*f + a
*e*g)*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)*(c*d^2 + a*e^2)), x] + Dist[1/
(2*a*c*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*(a + c*x^2)^(p + 1)*Simp[f
*(c^2*d^2*(2*p + 3) + a*c*e^2*(m + 2*p + 3)) - a*c*d*e*g*m + c*e*(c*d*f + a
*e*g)*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*
d^2 + a*e^2, 0] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2
*m, 2*p])
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 1213

```
Int[1/(((d_) + (e_.)*(x_)^2)*Sqrt[(a_) + (c_.)*(x_)^4]), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[Sqrt[-c], Int[1/((d + e*x^2)*Sqrt[q + c*x^2]*Sqrt
[q - c*x^2]), x], x]] /; FreeQ[{a, c, d, e}, x] && GtQ[a, 0] && LtQ[c, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{1}{(d\sec(e+fx))^{5/2}(a+b\tan(e+fx))}\,dx = \frac{\sqrt[4]{\sec^2(e+fx)}\ \text{Subst}\left(\int \frac{1}{(a+x)\left(1+\frac{x^2}{b^2}\right)^{9/4}}\,dx, x, b\tan(e+fx)\right)}{bd^2f\sqrt{d\sec(e+fx)}}$$

$$= \frac{2\cos^2(e+fx)(b+a\tan(e+fx))}{5(a^2+b^2)\,d^2f\sqrt{d\sec(e+fx)}} - \frac{\left(2b\sqrt[4]{\sec^2(e+fx)}\right)\text{Subst}\left(\int \frac{\frac{1}{2}}{(a}\right.}{5(a^2+b^2)\,d^2f}$$

$$= \frac{2\cos^2(e+fx)(b+a\tan(e+fx))}{5(a^2+b^2)\,d^2f\sqrt{d\sec(e+fx)}} + \frac{2\left(5b^3+a\left(3a^2+8b^2\right)\tan(e+\right.}{5(a^2+b^2)^2\,d^2f\sqrt{d\sec(e+f}}$$

$$= \frac{2\cos^2(e+fx)(b+a\tan(e+fx))}{5(a^2+b^2)\,d^2f\sqrt{d\sec(e+fx)}} + \frac{2\left(5b^3+a\left(3a^2+8b^2\right)\tan(e+\right.}{5(a^2+b^2)^2\,d^2f\sqrt{d\sec(e+f}}$$

$$= -\frac{2a\left(3a^2+8b^2\right)\tan(e+fx)}{5(a^2+b^2)^2\,d^2f\sqrt{d\sec(e+fx)}} + \frac{2\cos^2(e+fx)(b+a\tan(e+fx}{5(a^2+b^2)\,d^2f\sqrt{d\sec(e+fx)}}$$

$$= \frac{2a\left(3a^2+8b^2\right)E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt[4]{\sec^2(e+fx)}}{5(a^2+b^2)^2\,d^2f\sqrt{d\sec(e+fx)}} - \frac{2a(}{5(a^2+}$$

$$= \frac{2a\left(3a^2+8b^2\right)E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt[4]{\sec^2(e+fx)}}{5(a^2+b^2)^2\,d^2f\sqrt{d\sec(e+fx)}} - \frac{2a(}{5(a^2+}$$

$$= \frac{2a\left(3a^2+8b^2\right)E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt[4]{\sec^2(e+fx)}}{5(a^2+b^2)^2\,d^2f\sqrt{d\sec(e+fx)}} - \frac{2a(}{5(a^2+}$$

$$= \frac{b^{7/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt[4]{\sec^2(e+fx)}}{(a^2+b^2)^{9/4}\,d^2f\sqrt{d\sec(e+fx)}} - \frac{b^{7/2}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+}}{\sqrt[4]{a^2+b^2}}\right.}{(a^2+b^2)^{9/4}\,d^2f\sqrt{}}$$

Mathematica [C] time = 33.64, size = 17838, normalized size = 31.40

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/((d*Sec[e + f*x])^(5/2)*(a + b*Tan[e + f*x])),x]
```

```
[Out] Result too large to show
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e)),x, algorithm="fricas")
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{2}}\left(b\tan\left(fx+e\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e)),x, algorithm="giac")
[Out] integrate(1/((d*sec(f*x + e))^(5/2)*(b*tan(f*x + e) + a)), x)
```

maple [B] time = 1.76, size = 14547, normalized size = 25.61

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e)),x)
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{2}}\left(b\tan\left(fx+e\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e)),x, algorithm="maxima")
[Out] integrate(1/((d*sec(f*x + e))^(5/2)*(b*tan(f*x + e) + a)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{5/2}\,\left(a+b\,\tan\left(e+f\,x\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d/cos(e + f*x))^(5/2)*(a + b*tan(e + f*x))),x)
[Out] int(1/((d/cos(e + f*x))^(5/2)*(a + b*tan(e + f*x))), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(e+fx\right)\right)^{\frac{5}{2}}\left(a+b\tan\left(e+fx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))**(5/2)/(a+b*tan(f*x+e)),x)
[Out] Integral(1/((d*sec(e + f*x))**(5/2)*(a + b*tan(e + f*x))), x)
```

3.610 $\int \frac{(d\sec(e+fx))^{7/2}}{(a+b\tan(e+fx))^2}\,dx$

Optimal. Leaf size=480

$$-\frac{3ad^2(d\sec(e+fx))^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{2b^{5/2}f\sqrt[4]{a^2+b^2}\sec^2(e+fx)^{3/4}}+\frac{3ad^2(d\sec(e+fx))^{3/2}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{2b^{5/2}f\sqrt[4]{a^2+b^2}\sec^2(e+fx)^{3/4}}+\frac{3a^2d^2\sqrt{-\tan^2(e}{}$$

```
[Out] -3/2*a*d^2*arctan((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(d*sec(f*x+
e))^(3/2)/b^(5/2)/(a^2+b^2)^(1/4)/f/(sec(f*x+e)^2)^(3/4)+3/2*a*d^2*arctanh(
(sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(d*sec(f*x+e))^(3/2)/b^(5/2)/
(a^2+b^2)^(1/4)/f/(sec(f*x+e)^2)^(3/4)-3*d^2*(cos(1/2*arctan(tan(f*x+e)))^2
)^(1/2)/cos(1/2*arctan(tan(f*x+e)))*EllipticE(sin(1/2*arctan(tan(f*x+e))),2
^(1/2))*(d*sec(f*x+e))^(3/2)/b^2/f/(sec(f*x+e)^2)^(3/4)+3*d^2*cos(f*x+e)*(d
*sec(f*x+e))^(3/2)*sin(f*x+e)/b^2/f+3/2*a^2*d^2*cot(f*x+e)*EllipticPi((sec(
f*x+e)^2)^(1/4),-b/(a^2+b^2)^(1/2),I)*(d*sec(f*x+e))^(3/2)*(-tan(f*x+e)^2)^
(1/2)/b^3/f/(sec(f*x+e)^2)^(3/4)/(a^2+b^2)^(1/2)-3/2*a^2*d^2*cot(f*x+e)*Ell
ipticPi((sec(f*x+e)^2)^(1/4),b/(a^2+b^2)^(1/2),I)*(d*sec(f*x+e))^(3/2)*(-ta
n(f*x+e)^2)^(1/2)/b^3/f/(sec(f*x+e)^2)^(3/4)/(a^2+b^2)^(1/2)-d^2*(d*sec(f*x
+e))^(3/2)/b/f/(a+b*tan(f*x+e))
```

Rubi [A] time = 0.38, antiderivative size = 480, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 15, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {3512, 733, 844, 227, 196, 746, 399, 490, 1213, 537, 444, 63, 298, 205, 208}

$$-\frac{3ad^2(d\sec(e+fx))^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{2b^{5/2}f\sqrt[4]{a^2+b^2}\sec^2(e+fx)^{3/4}}+\frac{3ad^2(d\sec(e+fx))^{3/2}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{2b^{5/2}f\sqrt[4]{a^2+b^2}\sec^2(e+fx)^{3/4}}+\frac{3a^2d^2\sqrt{-\tan^2(e}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(7/2)/(a + b*Tan[e + f*x])^2,x]
```

```
[Out] (-3*a*d^2*ArcTan[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*(d*Sec
[e + f*x])^(3/2))/(2*b^(5/2)*(a^2 + b^2)^(1/4)*f*(Sec[e + f*x]^2)^(3/4)) +
(3*a*d^2*ArcTanh[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*(d*Sec
[e + f*x])^(3/2))/(2*b^(5/2)*(a^2 + b^2)^(1/4)*f*(Sec[e + f*x]^2)^(3/4)) -
(3*d^2*EllipticE[ArcTan[Tan[e + f*x]]/2, 2]*(d*Sec[e + f*x])^(3/2))/(b^2*f*
(Sec[e + f*x]^2)^(3/4)) + (3*d^2*Cos[e + f*x]*(d*Sec[e + f*x])^(3/2)*Sin[e
+ f*x])/(b^2*f) + (3*a^2*d^2*Cot[e + f*x]*EllipticPi[-(b/Sqrt[a^2 + b^2]),
ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*(d*Sec[e + f*x])^(3/2)*Sqrt[-Tan[e + f*
x]^2])/(2*b^3*Sqrt[a^2 + b^2]*f*(Sec[e + f*x]^2)^(3/4)) - (3*a^2*d^2*Cot[e
+ f*x]*EllipticPi[b/Sqrt[a^2 + b^2], ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*(d
*Sec[e + f*x])^(3/2)*Sqrt[-Tan[e + f*x]^2])/(2*b^3*Sqrt[a^2 + b^2]*f*(Sec[e
 + f*x]^2)^(3/4)) - (d^2*(d*Sec[e + f*x])^(3/2))/(b*f*(a + b*Tan[e + f*x]))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 196

```
Int[((a_) + (b_.)*(x_)^2)^(-5/4), x_Symbol] :> Simp[(2*EllipticE[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(5/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
```

```
, 0] && PosQ[b/a]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 227

```
Int[((a_) + (b_.)*(x_)^2)^(-1/4), x_Symbol] :> Simp[(2*x)/(a + b*x^2)^(1/4)
, x] - Dist[a, Int[1/(a + b*x^2)^(5/4), x], x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 298

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[-(a/b
), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s/(2*b), Int[1/(r + s*x^2), x
], x] - Dist[s/(2*b), Int[1/(r - s*x^2), x], x]] /; FreeQ[{a, b}, x] &&  !G
tQ[a/b, 0]
```

Rule 399

```
Int[1/(((a_) + (b_.)*(x_)^2)^(1/4)*((c_) + (d_.)*(x_)^2)), x_Symbol] :> Dis
t[(2*Sqrt[-((b*x^2)/a)])/x, Subst[Int[x^2/(Sqrt[1 - x^4/a]*(b*c - a*d + d*x
^4)), x], x, (a + b*x^2)^(1/4)], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c -
a*d, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 490

```
Int[(x_)^2/(((a_) + (b_.)*(x_)^4)*Sqrt[(c_) + (d_.)*(x_)^4]), x_Symbol] :>
With[{r = Numerator[Rt[-(a/b), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s
/(2*b), Int[1/((r + s*x^2)*Sqrt[c + d*x^4]), x], x] - Dist[s/(2*b), Int[1/(
(r - s*x^2)*Sqrt[c + d*x^4]), x], x]] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c
- a*d, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] &&  !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] &&  !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 733

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m + 1)*(a + c*x^2)^p)/(e*(m + 1)), x] - Dist[(2*c*p)/(e*(m + 1)
```

```
), Int[x*(d + e*x)^(m + 1)*(a + c*x^2)^(p - 1), x], x] /; FreeQ[{a, c, d, e
, m}, x] && NeQ[c*d^2 + a*e^2, 0] && GtQ[p, 0] && (IntegerQ[p] || LtQ[m, -1
]) && NeQ[m, -1] &&  !ILtQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e,
m, p, x]
```

Rule 746

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(1/4)), x_Symbol] :> Dist[
d, Int[1/((d^2 - e^2*x^2)*(a + c*x^2)^(1/4)), x], x] - Dist[e, Int[x/((d^2
- e^2*x^2)*(a + c*x^2)^(1/4)), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^
2 + a*e^2, 0]
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 1213

```
Int[1/(((d_) + (e_.)*(x_)^2)*Sqrt[(a_) + (c_.)*(x_)^4]), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[Sqrt[-c], Int[1/((d + e*x^2)*Sqrt[q + c*x^2]*Sqrt
[q - c*x^2]), x], x]] /; FreeQ[{a, c, d, e}, x] && GtQ[a, 0] && LtQ[c, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{(d\sec(e+fx))^{7/2}}{(a+b\tan(e+fx))^2}\,dx = \frac{\left(d^2(d\sec(e+fx))^{3/2}\right)\text{Subst}\left(\int \frac{\left(1+\frac{x^2}{b^2}\right)^{3/4}}{(a+x)^2}\,dx, x, b\tan(e+fx)\right)}{bf\sec^2(e+fx)^{3/4}}$$

$$= -\frac{d^2(d\sec(e+fx))^{3/2}}{bf(a+b\tan(e+fx))} + \frac{\left(3d^2(d\sec(e+fx))^{3/2}\right)\text{Subst}\left(\int \frac{x}{(a+x)\sqrt[4]{1+\frac{x^2}{b^2}}}\,dx, x, b\tan\right.}{2b^3f\sec^2(e+fx)^{3/4}}$$

$$= -\frac{d^2(d\sec(e+fx))^{3/2}}{bf(a+b\tan(e+fx))} + \frac{\left(3d^2(d\sec(e+fx))^{3/2}\right)\text{Subst}\left(\int \frac{1}{\sqrt[4]{1+\frac{x^2}{b^2}}}\,dx, x, b\tan(e\right.}{2b^3f\sec^2(e+fx)^{3/4}}$$

$$= \frac{3d^2\cos(e+fx)(d\sec(e+fx))^{3/2}\sin(e+fx)}{b^2f} - \frac{d^2(d\sec(e+fx))^{3/2}}{bf(a+b\tan(e+fx))} - \frac{\left(3d^2(d\,\mathrm{s}\right.}{}$$

$$= -\frac{3d^2E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)(d\sec(e+fx))^{3/2}}{b^2f\sec^2(e+fx)^{3/4}} + \frac{3d^2\cos(e+fx)(d\sec(e+f}{b^2f}$$

$$= -\frac{3d^2E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)(d\sec(e+fx))^{3/2}}{b^2f\sec^2(e+fx)^{3/4}} + \frac{3d^2\cos(e+fx)(d\sec(e+f}{b^2f}$$

$$= -\frac{3d^2E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)(d\sec(e+fx))^{3/2}}{b^2f\sec^2(e+fx)^{3/4}} + \frac{3d^2\cos(e+fx)(d\sec(e+f}{b^2f}$$
$$- \frac{3ad^2\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)(d\sec(e+fx))^{3/2}}{2b^{5/2}\sqrt[4]{a^2+b^2}\,f\sec^2(e+fx)^{3/4}} + \frac{3ad^2\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)(d}{2b^{5/2}\sqrt[4]{a^2+b^2}\,f\sec^2(e+}$$

Mathematica [C] time = 23.25, size = 1129, normalized size = 2.35

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Sec[e + f*x])^(7/2)/(a + b*Tan[e + f*x])^2,x]
```

```
[Out] (Cos[e + f*x]*(d*Sec[e + f*x])^(7/2)*(a*Cos[e + f*x] + b*Sin[e + f*x])^2*((
3*Cos[e + f*x])/(a*b) + (3*Sin[e + f*x])/b^2 - 1/(b*(a*Cos[e + f*x] + b*Sin
[e + f*x]))))/(f*(a + b*Tan[e + f*x])^2) + (3*(d*Sec[e + f*x])^(7/2)*(a*Cos
[e + f*x] + b*Sin[e + f*x])^2*(-((a*EllipticE[ArcSin[Tan[(e + f*x)/2]], -1]
*Sqrt[1 + Tan[(e + f*x)/2]^2])/Sqrt[1 - Tan[(e + f*x)/2]^2]) + (2*a*Ellipti
cF[ArcSin[Tan[(e + f*x)/2]], -1]*Sqrt[1 + Tan[(e + f*x)/2]^2])/Sqrt[1 - Tan
[(e + f*x)/2]^2] + (-2*Sqrt[2]*a*b*Sqrt[a^2 + b^2]*EllipticF[ArcSin[Sqrt[((
1 + I)*(1 + Tan[(e + f*x)/2]))/(I + Tan[(e + f*x)/2])]/Sqrt[2]], 2]*Sqrt[-(
(1 + I*Tan[(e + f*x)/2])/(I + Tan[(e + f*x)/2]))] + Sqrt[2]*a^2*Sqrt[a^2 +
b^2]*EllipticPi[((1 + I)*(a - I*(b + Sqrt[a^2 + b^2])))/(a + b + Sqrt[a^2 +
 b^2]), ArcSin[Sqrt[((1 + I)*(1 + Tan[(e + f*x)/2]))/(I + Tan[(e + f*x)/2])
]/Sqrt[2]], 2]*Sqrt[-((1 + I*Tan[(e + f*x)/2])/(I + Tan[(e + f*x)/2]))] + a
```

```
^2*(a + I*b + Sqrt[a^2 + b^2])*EllipticPi[((1 + I)*(a + I*(-b + Sqrt[a^2 +
b^2])))/(a + b - Sqrt[a^2 + b^2]), ArcSin[Sqrt[((1 + I)*(1 + Tan[(e + f*x)/
2]))/(I + Tan[(e + f*x)/2])]/Sqrt[2]], 2]*Sqrt[-((2 + (2*I)*Tan[(e + f*x)/2
])/(I + Tan[(e + f*x)/2]))] - a^3*EllipticPi[((1 + I)*(a - I*(b + Sqrt[a^2
+ b^2])))/(a + b + Sqrt[a^2 + b^2]), ArcSin[Sqrt[((1 + I)*(1 + Tan[(e + f*x
)/2]))/(I + Tan[(e + f*x)/2])]/Sqrt[2]], 2]*Sqrt[-((2 + (2*I)*Tan[(e + f*x)
/2])/(I + Tan[(e + f*x)/2]))] - I*a^2*b*EllipticPi[((1 + I)*(a - I*(b + Sqr
t[a^2 + b^2])))/(a + b + Sqrt[a^2 + b^2]), ArcSin[Sqrt[((1 + I)*(1 + Tan[(e
 + f*x)/2]))/(I + Tan[(e + f*x)/2])]/Sqrt[2]], 2]*Sqrt[-((2 + (2*I)*Tan[(e
+ f*x)/2])/(I + Tan[(e + f*x)/2]))] - 2*b^2*Sqrt[a^2 + b^2]*Sqrt[(-1 + Tan[
(e + f*x)/2]^2)/(I + Tan[(e + f*x)/2])^2] - 2*a*b*Sqrt[a^2 + b^2]*Tan[(e +
f*x)/2]*Sqrt[(-1 + Tan[(e + f*x)/2]^2)/(I + Tan[(e + f*x)/2])^2])/(2*b*Sqrt
[a^2 + b^2]*Sqrt[(-1 + Tan[(e + f*x)/2]^2)/(I + Tan[(e + f*x)/2])^2])))/(a*
b^2*f*Sec[e + f*x]^(3/2)*Sqrt[(1 + Tan[(e + f*x)/2]^2)/(1 - Tan[(e + f*x)/2
]^2)]*(a + b*Tan[e + f*x])^2)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(7/2)/(a+b*tan(f*x+e))^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   catde
f: division by zero
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(fx+e\right)\right)^{\frac{7}{2}}}{\left(b \tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(7/2)/(a+b*tan(f*x+e))^2,x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(7/2)/(b*tan(f*x + e) + a)^2, x)
```

maple [B] time = 5.06, size = 44463, normalized size = 92.63

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(7/2)/(a+b*tan(f*x+e))^2,x)
```

```
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(7/2)/(a+b*tan(f*x+e))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{7/2}}{{\left(a+b\,\tan\left(e+f\,x\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(7/2)/(a + b*tan(e + f*x))^2,x)
```

```
[Out] int((d/cos(e + f*x))^(7/2)/(a + b*tan(e + f*x))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(7/2)/(a+b*tan(f*x+e))**2,x)
```

```
[Out] Timed out
```

3.611 $\int \frac{(d\sec(e+fx))^{5/2}}{(a+b\tan(e+fx))^2}\,dx$

Optimal. Leaf size=440

$$-\frac{a^2d^2\sqrt{-\tan^2(e+fx)}\,\cot(e+fx)\sqrt{d\sec(e+fx)}\,\Pi\left(-\frac{b}{\sqrt{a^2+b^2}};\sin^{-1}\left(\sqrt[4]{\sec^2(e+fx)}\right)\middle|-1\right)}{2b^2f\left(a^2+b^2\right)\sqrt[4]{\sec^2(e+fx)}}-\frac{a^2d^2\sqrt{-\tan^2(e+f}{}$$

```
[Out] 1/2*a*d^2*arctan((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(d*sec(f*x+e
))^(1/2)/b^(3/2)/(a^2+b^2)^(3/4)/f/(sec(f*x+e)^2)^(1/4)+1/2*a*d^2*arctanh((
sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(d*sec(f*x+e))^(1/2)/b^(3/2)/(
a^2+b^2)^(3/4)/f/(sec(f*x+e)^2)^(1/4)+d^2*(cos(1/2*arctan(tan(f*x+e)))^2)^(
1/2)/cos(1/2*arctan(tan(f*x+e)))*EllipticF(sin(1/2*arctan(tan(f*x+e))),2^(1
/2))*(d*sec(f*x+e))^(1/2)/b^2/f/(sec(f*x+e)^2)^(1/4)-1/2*a^2*d^2*cot(f*x+e)
*EllipticPi((sec(f*x+e)^2)^(1/4),-b/(a^2+b^2)^(1/2),I)*(d*sec(f*x+e))^(1/2)
*(-tan(f*x+e)^2)^(1/2)/b^2/(a^2+b^2)/f/(sec(f*x+e)^2)^(1/4)-1/2*a^2*d^2*cot
(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1/4),b/(a^2+b^2)^(1/2),I)*(d*sec(f*x+e))
^(1/2)*(-tan(f*x+e)^2)^(1/2)/b^2/(a^2+b^2)/f/(sec(f*x+e)^2)^(1/4)-d^2*(d*se
c(f*x+e))^(1/2)/b/f/(a+b*tan(f*x+e))
```

Rubi [A] time = 0.39, antiderivative size = 440, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 15, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {3512, 733, 844, 231, 747, 401, 108, 409, 1213, 537, 444, 63, 212, 208, 205}

$$\frac{ad^2\sqrt{d\sec(e+fx)}\,\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{2b^{3/2}f\left(a^2+b^2\right)^{3/4}\sqrt[4]{\sec^2(e+fx)}}+\frac{ad^2\sqrt{d\sec(e+fx)}\,\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{2b^{3/2}f\left(a^2+b^2\right)^{3/4}\sqrt[4]{\sec^2(e+fx)}}-\frac{a^2d^2\sqrt{-\tan^2(e+fx)}\,\text{co}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(5/2)/(a + b*Tan[e + f*x])^2,x]
```

```
[Out] (a*d^2*ArcTan[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*Sqrt[d*Se
c[e + f*x]])/(2*b^(3/2)*(a^2 + b^2)^(3/4)*f*(Sec[e + f*x]^2)^(1/4)) + (a*d^
2*ArcTanh[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*Sqrt[d*Sec[e
+ f*x]])/(2*b^(3/2)*(a^2 + b^2)^(3/4)*f*(Sec[e + f*x]^2)^(1/4)) + (d^2*Elli
pticF[ArcTan[Tan[e + f*x]]/2, 2]*Sqrt[d*Sec[e + f*x]])/(b^2*f*(Sec[e + f*x]
^2)^(1/4)) - (a^2*d^2*Cot[e + f*x]*EllipticPi[-(b/Sqrt[a^2 + b^2]), ArcSin[
(Sec[e + f*x]^2)^(1/4)], -1]*Sqrt[d*Sec[e + f*x]]*Sqrt[-Tan[e + f*x]^2])/(2
*b^2*(a^2 + b^2)*f*(Sec[e + f*x]^2)^(1/4)) - (a^2*d^2*Cot[e + f*x]*Elliptic
Pi[b/Sqrt[a^2 + b^2], ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*Sqrt[d*Sec[e + f*
x]]*Sqrt[-Tan[e + f*x]^2])/(2*b^2*(a^2 + b^2)*f*(Sec[e + f*x]^2)^(1/4)) - (
d^2*Sqrt[d*Sec[e + f*x]])/(b*f*(a + b*Tan[e + f*x]))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 108

```
Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(
3/4)), x_Symbol] :> Dist[-4, Subst[Int[1/((b*e - a*f - b*x^4)*Sqrt[c - (d*e
)/f + (d*x^4)/f]), x], x, (e + f*x)^(1/4)], x] /; FreeQ[{a, b, c, d, e, f},
```

```
x] && GtQ[-(f/(d*e - c*f)), 0]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^4)^(-1), x_Symbol] :> With[{r = Numerator[Rt[-(a/b),
 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[r/(2*a), Int[1/(r - s*x^2), x],
 x] + Dist[r/(2*a), Int[1/(r + s*x^2), x], x]] /; FreeQ[{a, b}, x] &&  !GtQ
[a/b, 0]
```

Rule 231

```
Int[((a_) + (b_.)*(x_)^2)^(-3/4), x_Symbol] :> Simp[(2*EllipticF[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(3/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 401

```
Int[1/(((a_) + (b_.)*(x_)^2)^(3/4)*((c_) + (d_.)*(x_)^2)), x_Symbol] :> Dis
t[Sqrt[-((b*x^2)/a)]/(2*x), Subst[Int[1/(Sqrt[-((b*x)/a)]*(a + b*x)^(3/4)*(
c + d*x)), x], x, x^2], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 409

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^4]*((c_) + (d_.)*(x_)^4)), x_Symbol] :> Dist[
1/(2*c), Int[1/(Sqrt[a + b*x^4]*(1 - Rt[-(d/c), 2]*x^2)), x], x] + Dist[1/(
2*c), Int[1/(Sqrt[a + b*x^4]*(1 + Rt[-(d/c), 2]*x^2)), x], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] &&  !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] &&  !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 733

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m + 1)*(a + c*x^2)^p)/(e*(m + 1)), x] - Dist[(2*c*p)/(e*(m + 1)
), Int[x*(d + e*x)^(m + 1)*(a + c*x^2)^(p - 1), x], x] /; FreeQ[{a, c, d, e
, m}, x] && NeQ[c*d^2 + a*e^2, 0] && GtQ[p, 0] && (IntegerQ[p] || LtQ[m, -1
```

```
]) && NeQ[m, -1] && !ILtQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e,
m, p, x]
```

Rule 747

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(3/4)), x_Symbol] :> Dist[
d, Int[1/((d^2 - e^2*x^2)*(a + c*x^2)^(3/4)), x], x] - Dist[e, Int[x/((d^2
- e^2*x^2)*(a + c*x^2)^(3/4)), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^
2 + a*e^2, 0]
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && !IGtQ[m, 0]
```

Rule 1213

```
Int[1/(((d_) + (e_.)*(x_)^2)*Sqrt[(a_) + (c_.)*(x_)^4]), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[Sqrt[-c], Int[1/((d + e*x^2)*Sqrt[q + c*x^2]*Sqrt
[q - c*x^2]), x], x]] /; FreeQ[{a, c, d, e}, x] && GtQ[a, 0] && LtQ[c, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] && !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{(d\sec(e+fx))^{5/2}}{(a+b\tan(e+fx))^2}\,dx = \frac{\left(d^2\sqrt{d\sec(e+fx)}\right)\text{Subst}\left(\int \frac{\sqrt[4]{1+\frac{x^2}{b^2}}}{(a+x)^2}\,dx, x, b\tan(e+fx)\right)}{bf\sqrt[4]{\sec^2(e+fx)}}$$

$$= -\frac{d^2\sqrt{d\sec(e+fx)}}{bf(a+b\tan(e+fx))} + \frac{\left(d^2\sqrt{d\sec(e+fx)}\right)\text{Subst}\left(\int \frac{x}{(a+x)\left(1+\frac{x^2}{b^2}\right)^{3/4}}\,dx, x, b\tan(\right.}{2b^3f\sqrt[4]{\sec^2(e+fx)}}$$

$$= -\frac{d^2\sqrt{d\sec(e+fx)}}{bf(a+b\tan(e+fx))} + \frac{\left(d^2\sqrt{d\sec(e+fx)}\right)\text{Subst}\left(\int \frac{1}{\left(1+\frac{x^2}{b^2}\right)^{3/4}}\,dx, x, b\tan(e+\right.}{2b^3f\sqrt[4]{\sec^2(e+fx)}}$$

$$= \frac{d^2F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{b^2f\sqrt[4]{\sec^2(e+fx)}} - \frac{d^2\sqrt{d\sec(e+fx)}}{bf(a+b\tan(e+fx))} + \frac{\left(ad^2\sqrt{a\right.}{}$$

$$= \frac{d^2F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{b^2f\sqrt[4]{\sec^2(e+fx)}} - \frac{d^2\sqrt{d\sec(e+fx)}}{bf(a+b\tan(e+fx))} + \frac{\left(ad^2\sqrt{a\right.}{}$$

$$= \frac{d^2F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{b^2f\sqrt[4]{\sec^2(e+fx)}} - \frac{d^2\sqrt{d\sec(e+fx)}}{bf(a+b\tan(e+fx))} + \frac{\left(ad^2\sqrt{a\right.}{}$$

$$= \frac{d^2F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{b^2f\sqrt[4]{\sec^2(e+fx)}} - \frac{d^2\sqrt{d\sec(e+fx)}}{bf(a+b\tan(e+fx))} + \frac{\left(ad^2\sqrt{a\right.}{}$$

$$= \frac{ad^2\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt{d\sec(e+fx)}}{2b^{3/2}\left(a^2+b^2\right)^{3/4}f\sqrt[4]{\sec^2(e+fx)}} + \frac{ad^2\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt{d\sec(}{2b^{3/2}\left(a^2+b^2\right)^{3/4}f\sqrt[4]{\sec^2(e+f}$$

$$= \frac{ad^2\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt{d\sec(e+fx)}}{2b^{3/2}\left(a^2+b^2\right)^{3/4}f\sqrt[4]{\sec^2(e+fx)}} + \frac{ad^2\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt{d\sec(}{2b^{3/2}\left(a^2+b^2\right)^{3/4}f\sqrt[4]{\sec^2(e+f}$$

Mathematica [C] time = 22.05, size = 3091, normalized size = 7.02

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Sec[e + f*x])^(5/2)/(a + b*Tan[e + f*x])^2,x]
```

```
[Out] ((d*Sec[e + f*x])^(5/2)*(a*Cos[e + f*x] + b*Sin[e + f*x])^2*(-(1/(a*b)) + S
in[e + f*x]/(a*(a*Cos[e + f*x] + b*Sin[e + f*x]))))/(f*(a + b*Tan[e + f*x])
^2) - (((-2*I)*b*Sqrt[a^2 + b^2]*EllipticF[ArcSin[Sqrt[1 - I*Cos[e + f*x] +
 Sin[e + f*x]]/Sqrt[2]], 2] + a*(a - I*b + Sqrt[a^2 + b^2])*EllipticPi[((1
```

```
+ I)*(a + I*(-b + Sqrt[a^2 + b^2])))/(a + b - Sqrt[a^2 + b^2]), ArcSin[Sqrt
[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2] + a*(-a + I*b + Sqrt[a^2 +
 b^2])*EllipticPi[((1 + I)*(a - I*(b + Sqrt[a^2 + b^2])))/(a + b + Sqrt[a^2
 + b^2]), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2])*(d*S
ec[e + f*x])^(5/2)*Sqrt[Cos[(e + f*x)/2]^2*Sec[e + f*x]]*Sqrt[I*Cos[e + f*x
] - Sin[e + f*x]]*Sqrt[Cos[e + f*x]*(Cos[e + f*x] + I*Sin[e + f*x])]*Sin[e
+ f*x]*(a*Cos[e + f*x] + b*Sin[e + f*x])*(I + Tan[(e + f*x)/2])^2)/(4*(a -
I*b)*b^3*Sqrt[a^2 + b^2]*f*Sqrt[(1 + Cos[e + f*x])^(-1)]*(a + b*Tan[e + f*x
])^2*(-1/2*(((-2*I)*b*Sqrt[a^2 + b^2]*EllipticF[ArcSin[Sqrt[1 - I*Cos[e + f
*x] + Sin[e + f*x]]/Sqrt[2]], 2] + a*(a - I*b + Sqrt[a^2 + b^2])*EllipticPi
[((1 + I)*(a + I*(-b + Sqrt[a^2 + b^2])))/(a + b - Sqrt[a^2 + b^2]), ArcSin
[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2] + a*(-a + I*b + Sqrt[
a^2 + b^2])*EllipticPi[((1 + I)*(a - I*(b + Sqrt[a^2 + b^2])))/(a + b + Sqr
t[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2])
*Sec[(e + f*x)/2]^2*Sqrt[Cos[(e + f*x)/2]^2*Sec[e + f*x]]*Sqrt[I*Cos[e + f*
x] - Sin[e + f*x]]*Sqrt[Cos[e + f*x]*(Cos[e + f*x] + I*Sin[e + f*x])]*(I +
Tan[(e + f*x)/2]))/((a - I*b)*b^2*Sqrt[a^2 + b^2]*Sqrt[(1 + Cos[e + f*x])^(
-1)]) - (((-2*I)*b*Sqrt[a^2 + b^2]*EllipticF[ArcSin[Sqrt[1 - I*Cos[e + f*x]
 + Sin[e + f*x]]/Sqrt[2]], 2] + a*(a - I*b + Sqrt[a^2 + b^2])*EllipticPi[((
1 + I)*(a + I*(-b + Sqrt[a^2 + b^2])))/(a + b - Sqrt[a^2 + b^2]), ArcSin[Sq
rt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2] + a*(-a + I*b + Sqrt[a^2
 + b^2])*EllipticPi[((1 + I)*(a - I*(b + Sqrt[a^2 + b^2])))/(a + b + Sqrt[a
^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2])*Sq
rt[Cos[(e + f*x)/2]^2*Sec[e + f*x]]*(-Cos[e + f*x] - I*Sin[e + f*x])*Sqrt[C
os[e + f*x]*(Cos[e + f*x] + I*Sin[e + f*x])]*(I + Tan[(e + f*x)/2])^2)/(4*(
a - I*b)*b^2*Sqrt[a^2 + b^2]*Sqrt[(1 + Cos[e + f*x])^(-1)]*Sqrt[I*Cos[e + f
*x] - Sin[e + f*x]]) + (Sqrt[(1 + Cos[e + f*x])^(-1)]*((-2*I)*b*Sqrt[a^2 +
b^2]*EllipticF[ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2]
+ a*(a - I*b + Sqrt[a^2 + b^2])*EllipticPi[((1 + I)*(a + I*(-b + Sqrt[a^2 +
 b^2])))/(a + b - Sqrt[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e
+ f*x]]/Sqrt[2]], 2] + a*(-a + I*b + Sqrt[a^2 + b^2])*EllipticPi[((1 + I)*(
a - I*(b + Sqrt[a^2 + b^2])))/(a + b + Sqrt[a^2 + b^2]), ArcSin[Sqrt[1 - I*
Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2])*Sqrt[Cos[(e + f*x)/2]^2*Sec[e +
f*x]]*Sqrt[I*Cos[e + f*x] - Sin[e + f*x]]*Sqrt[Cos[e + f*x]*(Cos[e + f*x] +
 I*Sin[e + f*x])]*Sin[e + f*x]*(I + Tan[(e + f*x)/2])^2)/(4*(a - I*b)*b^2*S
qrt[a^2 + b^2]) - (((-2*I)*b*Sqrt[a^2 + b^2]*EllipticF[ArcSin[Sqrt[1 - I*Co
s[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2] + a*(a - I*b + Sqrt[a^2 + b^2])*Ell
ipticPi[((1 + I)*(a + I*(-b + Sqrt[a^2 + b^2])))/(a + b - Sqrt[a^2 + b^2]),
 ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2] + a*(-a + I*b
+ Sqrt[a^2 + b^2])*EllipticPi[((1 + I)*(a - I*(b + Sqrt[a^2 + b^2])))/(a +
b + Sqrt[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2
]], 2])*Sqrt[Cos[(e + f*x)/2]^2*Sec[e + f*x]]*Sqrt[I*Cos[e + f*x] - Sin[e +
 f*x]]*(Cos[e + f*x]*(I*Cos[e + f*x] - Sin[e + f*x]) - (Cos[e + f*x] + I*Si
n[e + f*x])*Sin[e + f*x])*(I + Tan[(e + f*x)/2])^2)/(4*(a - I*b)*b^2*Sqrt[a
^2 + b^2]*Sqrt[(1 + Cos[e + f*x])^(-1)]*Sqrt[Cos[e + f*x]*(Cos[e + f*x] + I
*Sin[e + f*x])]) - (Sqrt[Cos[(e + f*x)/2]^2*Sec[e + f*x]]*Sqrt[I*Cos[e + f*
x] - Sin[e + f*x]]*Sqrt[Cos[e + f*x]*(Cos[e + f*x] + I*Sin[e + f*x])]*(((-I
)*b*Sqrt[a^2 + b^2]*(Cos[e + f*x] + I*Sin[e + f*x]))/(Sqrt[2]*Sqrt[1 + (-1
+ I*Cos[e + f*x] - Sin[e + f*x])/2]*Sqrt[I*Cos[e + f*x] - Sin[e + f*x]]*Sqr
t[1 - I*Cos[e + f*x] + Sin[e + f*x]]) + (a*(a - I*b + Sqrt[a^2 + b^2])*(Cos
[e + f*x] + I*Sin[e + f*x]))/(2*Sqrt[2]*Sqrt[1 + (-1 + I*Cos[e + f*x] - Sin
[e + f*x])/2]*Sqrt[I*Cos[e + f*x] - Sin[e + f*x]]*Sqrt[1 - I*Cos[e + f*x] +
 Sin[e + f*x]]*(1 - ((1/2 + I/2)*(a + I*(-b + Sqrt[a^2 + b^2]))*(1 - I*Cos[
e + f*x] + Sin[e + f*x]))/(a + b - Sqrt[a^2 + b^2]))) + (a*(-a + I*b + Sqrt
[a^2 + b^2])*(Cos[e + f*x] + I*Sin[e + f*x]))/(2*Sqrt[2]*Sqrt[1 + (-1 + I*C
os[e + f*x] - Sin[e + f*x])/2]*Sqrt[I*Cos[e + f*x] - Sin[e + f*x]]*Sqrt[1 -
 I*Cos[e + f*x] + Sin[e + f*x]]*(1 - ((1/2 + I/2)*(a - I*(b + Sqrt[a^2 + b^
2]))*(1 - I*Cos[e + f*x] + Sin[e + f*x]))/(a + b + Sqrt[a^2 + b^2]))))*(I +
 Tan[(e + f*x)/2])^2)/(2*(a - I*b)*b^2*Sqrt[a^2 + b^2]*Sqrt[(1 + Cos[e + f*
```

```
x])^(-1)]) - (((-2*I)*b*Sqrt[a^2 + b^2]*EllipticF[ArcSin[Sqrt[1 - I*Cos[e +
 f*x] + Sin[e + f*x]]/Sqrt[2]], 2] + a*(a - I*b + Sqrt[a^2 + b^2])*Elliptic
Pi[((1 + I)*(a + I*(-b + Sqrt[a^2 + b^2])))/(a + b - Sqrt[a^2 + b^2]), ArcS
in[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2] + a*(-a + I*b + Sqr
t[a^2 + b^2])*EllipticPi[((1 + I)*(a - I*(b + Sqrt[a^2 + b^2])))/(a + b + S
qrt[a^2 + b^2]), ArcSin[Sqrt[1 - I*Cos[e + f*x] + Sin[e + f*x]]/Sqrt[2]], 2
])*Sqrt[I*Cos[e + f*x] - Sin[e + f*x]]*Sqrt[Cos[e + f*x]*(Cos[e + f*x] + I*
Sin[e + f*x])]*(I + Tan[(e + f*x)/2])^2*(-(Cos[(e + f*x)/2]*Sec[e + f*x]*Si
n[(e + f*x)/2]) + Cos[(e + f*x)/2]^2*Sec[e + f*x]*Tan[e + f*x]))/(4*(a - I*
b)*b^2*Sqrt[a^2 + b^2]*Sqrt[(1 + Cos[e + f*x])^(-1)]*Sqrt[Cos[(e + f*x)/2]^
2*Sec[e + f*x]])))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e))^2,x, algorithm="fricas")
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{2}}}{\left(b\tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e))^2,x, algorithm="giac")
[Out] integrate((d*sec(f*x + e))^(5/2)/(b*tan(f*x + e) + a)^2, x)
```

maple [B] time = 1.87, size = 5337, normalized size = 12.13

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e))^2,x)
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e))^2,x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{5/2}}{{\left(a+b\,\mathrm{tan}\left(e+f\,x\right)\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(5/2)/(a + b*tan(e + f*x))^2,x)
```

```
[Out] int((d/cos(e + f*x))^(5/2)/(a + b*tan(e + f*x))^2, x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(e+fx\right)\right)^{\frac{5}{2}}}{\left(a+b\tan\left(e+fx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(5/2)/(a+b*tan(f*x+e))**2,x)
```

```
[Out] Integral((d*sec(e + f*x))**(5/2)/(a + b*tan(e + f*x))**2, x)
```

3.612 $\int \frac{(d\sec(e+fx))^{3/2}}{(a+b\tan(e+fx))^2}\,dx$

Optimal. Leaf size=477

$$\frac{a(d\sec(e+fx))^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{2\sqrt{b}f\left(a^2+b^2\right)^{5/4}\sec^2(e+fx)^{3/4}}-\frac{a(d\sec(e+fx))^{3/2}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{2\sqrt{b}f\left(a^2+b^2\right)^{5/4}\sec^2(e+fx)^{3/4}}-\frac{b(d\sec(e+fx))^{3/}}{f\left(a^2+b^2\right)(a+b\tan(e}$$

```
[Out] -(cos(1/2*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arctan(tan(f*x+e)))*Elliptic
E(sin(1/2*arctan(tan(f*x+e))),2^(1/2))*(d*sec(f*x+e))^(3/2)/(a^2+b^2)/f/(se
c(f*x+e)^2)^(3/4)+cos(f*x+e)*(d*sec(f*x+e))^(3/2)*sin(f*x+e)/(a^2+b^2)/f+1/
2*a*arctan((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(d*sec(f*x+e))^(3/
2)/(a^2+b^2)^(5/4)/f/(sec(f*x+e)^2)^(3/4)/b^(1/2)-1/2*a*arctanh((sec(f*x+e)
^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(d*sec(f*x+e))^(3/2)/(a^2+b^2)^(5/4)/f/(
sec(f*x+e)^2)^(3/4)/b^(1/2)-1/2*a^2*cot(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1
/4),-b/(a^2+b^2)^(1/2),I)*(d*sec(f*x+e))^(3/2)*(-tan(f*x+e)^2)^(1/2)/b/(a^2
+b^2)^(3/2)/f/(sec(f*x+e)^2)^(3/4)+1/2*a^2*cot(f*x+e)*EllipticPi((sec(f*x+e
)^2)^(1/4),b/(a^2+b^2)^(1/2),I)*(d*sec(f*x+e))^(3/2)*(-tan(f*x+e)^2)^(1/2)/
b/(a^2+b^2)^(3/2)/f/(sec(f*x+e)^2)^(3/4)-b*(d*sec(f*x+e))^(3/2)/(a^2+b^2)/f
/(a+b*tan(f*x+e))
```

Rubi [A] time = 0.39, antiderivative size = 477, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 15, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {3512, 745, 844, 227, 196, 746, 399, 490, 1213, 537, 444, 63, 298, 205, 208}

$$\frac{a(d\sec(e+fx))^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{2\sqrt{b}f\left(a^2+b^2\right)^{5/4}\sec^2(e+fx)^{3/4}}-\frac{a(d\sec(e+fx))^{3/2}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{2\sqrt{b}f\left(a^2+b^2\right)^{5/4}\sec^2(e+fx)^{3/4}}-\frac{b(d\sec(e+fx))^{3/}}{f\left(a^2+b^2\right)(a+b\tan(e}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(3/2)/(a + b*Tan[e + f*x])^2,x]
```

```
[Out] (a*ArcTan[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*(d*Sec[e + f*
x])^(3/2))/(2*Sqrt[b]*(a^2 + b^2)^(5/4)*f*(Sec[e + f*x]^2)^(3/4)) - (a*ArcT
anh[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*(d*Sec[e + f*x])^(3
/2))/(2*Sqrt[b]*(a^2 + b^2)^(5/4)*f*(Sec[e + f*x]^2)^(3/4)) - (EllipticE[Ar
cTan[Tan[e + f*x]]/2, 2]*(d*Sec[e + f*x])^(3/2))/((a^2 + b^2)*f*(Sec[e + f*
x]^2)^(3/4)) + (Cos[e + f*x]*(d*Sec[e + f*x])^(3/2)*Sin[e + f*x])/((a^2 + b
^2)*f) - (a^2*Cot[e + f*x]*EllipticPi[-(b/Sqrt[a^2 + b^2]), ArcSin[(Sec[e +
 f*x]^2)^(1/4)], -1]*(d*Sec[e + f*x])^(3/2)*Sqrt[-Tan[e + f*x]^2])/(2*b*(a^
2 + b^2)^(3/2)*f*(Sec[e + f*x]^2)^(3/4)) + (a^2*Cot[e + f*x]*EllipticPi[b/S
qrt[a^2 + b^2], ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*(d*Sec[e + f*x])^(3/2)*
Sqrt[-Tan[e + f*x]^2])/(2*b*(a^2 + b^2)^(3/2)*f*(Sec[e + f*x]^2)^(3/4)) - (
b*(d*Sec[e + f*x])^(3/2))/((a^2 + b^2)*f*(a + b*Tan[e + f*x]))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 196

```
Int[((a_) + (b_.)*(x_)^2)^(-5/4), x_Symbol] :> Simp[(2*EllipticE[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(5/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
```

```
, 0] && PosQ[b/a]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 227

```
Int[((a_) + (b_.)*(x_)^2)^(-1/4), x_Symbol] :> Simp[(2*x)/(a + b*x^2)^(1/4)
, x] - Dist[a, Int[1/(a + b*x^2)^(5/4), x], x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 298

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[-(a/b
), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s/(2*b), Int[1/(r + s*x^2), x
], x] - Dist[s/(2*b), Int[1/(r - s*x^2), x], x]] /; FreeQ[{a, b}, x] &&  !G
tQ[a/b, 0]
```

Rule 399

```
Int[1/(((a_) + (b_.)*(x_)^2)^(1/4)*((c_) + (d_.)*(x_)^2)), x_Symbol] :> Dis
t[(2*Sqrt[-((b*x^2)/a)])/x, Subst[Int[x^2/(Sqrt[1 - x^4/a]*(b*c - a*d + d*x
^4)), x], x, (a + b*x^2)^(1/4)], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c -
a*d, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 490

```
Int[(x_)^2/(((a_) + (b_.)*(x_)^4)*Sqrt[(c_) + (d_.)*(x_)^4]), x_Symbol] :>
With[{r = Numerator[Rt[-(a/b), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s
/(2*b), Int[1/((r + s*x^2)*Sqrt[c + d*x^4]), x], x] - Dist[s/(2*b), Int[1/(
(r - s*x^2)*Sqrt[c + d*x^4]), x], x]] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c
- a*d, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] &&  !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] &&  !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 745

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/((m + 1)*(c*d^2 + a*e^2)), x] + D
```

```
ist[c/((m + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)*Simp[d*(m + 1) - e*(
m + 2*p + 3)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 NeQ[c*d^2 + a*e^2, 0] && NeQ[m, -1] && ((LtQ[m, -1] && IntQuadraticQ[a, 0,
 c, d, e, m, p, x]) || (SumSimplerQ[m, 1] && IntegerQ[p]) || ILtQ[Simplify[
m + 2*p + 3], 0])
```

Rule 746

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(1/4)), x_Symbol] :> Dist[
d, Int[1/((d^2 - e^2*x^2)*(a + c*x^2)^(1/4)), x], x] - Dist[e, Int[x/((d^2
- e^2*x^2)*(a + c*x^2)^(1/4)), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^
2 + a*e^2, 0]
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 1213

```
Int[1/(((d_) + (e_.)*(x_)^2)*Sqrt[(a_) + (c_.)*(x_)^4]), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[Sqrt[-c], Int[1/((d + e*x^2)*Sqrt[q + c*x^2]*Sqrt
[q - c*x^2]), x], x]] /; FreeQ[{a, c, d, e}, x] && GtQ[a, 0] && LtQ[c, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{(d\sec(e+fx))^{3/2}}{(a+b\tan(e+fx))^2}\,dx = \frac{(d\sec(e+fx))^{3/2}\,\text{Subst}\left(\int \frac{1}{(a+x)^2\sqrt[4]{1+\frac{x^2}{b^2}}}\,dx, x, b\tan(e+fx)\right)}{bf\sec^2(e+fx)^{3/4}}$$

$$= -\frac{b(d\sec(e+fx))^{3/2}}{\left(a^2+b^2\right)f(a+b\tan(e+fx))} - \frac{(d\sec(e+fx))^{3/2}\,\text{Subst}\left(\int \frac{-a-\frac{x}{2}}{(a+x)\sqrt[4]{1+\frac{x^2}{b^2}}}\,dx, x, b\tan\right.}{b\left(a^2+b^2\right)f\sec^2(e+fx)^{3/4}}$$

$$= -\frac{b(d\sec(e+fx))^{3/2}}{\left(a^2+b^2\right)f(a+b\tan(e+fx))} + \frac{(d\sec(e+fx))^{3/2}\,\text{Subst}\left(\int \frac{1}{\sqrt[4]{1+\frac{x^2}{b^2}}}\,dx, x, b\tan(e+\right.}{2b\left(a^2+b^2\right)f\sec^2(e+fx)^{3/4}}$$

$$= \frac{\cos(e+fx)(d\sec(e+fx))^{3/2}\sin(e+fx)}{\left(a^2+b^2\right)f} - \frac{b(d\sec(e+fx))^{3/2}}{\left(a^2+b^2\right)f(a+b\tan(e+fx))} - \frac{(d\sec(}{}$$

$$= -\frac{E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)(d\sec(e+fx))^{3/2}}{\left(a^2+b^2\right)f\sec^2(e+fx)^{3/4}} + \frac{\cos(e+fx)(d\sec(e+fx))^{3/2}\sin(}{\left(a^2+b^2\right)f}$$

$$= -\frac{E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)(d\sec(e+fx))^{3/2}}{\left(a^2+b^2\right)f\sec^2(e+fx)^{3/4}} + \frac{\cos(e+fx)(d\sec(e+fx))^{3/2}\sin(}{\left(a^2+b^2\right)f}$$

$$= -\frac{E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)(d\sec(e+fx))^{3/2}}{\left(a^2+b^2\right)f\sec^2(e+fx)^{3/4}} + \frac{\cos(e+fx)(d\sec(e+fx))^{3/2}\sin(}{\left(a^2+b^2\right)f}$$

$$= \frac{a\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)(d\sec(e+fx))^{3/2}}{2\sqrt{b}\left(a^2+b^2\right)^{5/4}f\sec^2(e+fx)^{3/4}} - \frac{a\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)(d\sec(e+fx)}{2\sqrt{b}\left(a^2+b^2\right)^{5/4}f\sec^2(e+fx)^{3/4}}$$

Mathematica [C] time = 31.00, size = 6560, normalized size = 13.75

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Sec[e + f*x])^(3/2)/(a + b*Tan[e + f*x])^2,x]
```

```
[Out] Result too large to show
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e))^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   catde
f: division by zero
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(fx+e\right)\right)^{\frac{3}{2}}}{\left(b\tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e))^2,x, algorithm="giac")
[Out] integrate((d*sec(f*x + e))^(3/2)/(b*tan(f*x + e) + a)^2, x)
```

maple [B] time = 2.12, size = 25422, normalized size = 53.30

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e))^2,x)
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e))^2,x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{3/2}}{{\left(a+b\,\tan\left(e+f\,x\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(3/2)/(a + b*tan(e + f*x))^2,x)
[Out] int((d/cos(e + f*x))^(3/2)/(a + b*tan(e + f*x))^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(e+fx\right)\right)^{\frac{3}{2}}}{\left(a+b\tan\left(e+fx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(3/2)/(a+b*tan(f*x+e))**2,x)
[Out] Integral((d*sec(e + f*x))**(3/2)/(a + b*tan(e + f*x))**2, x)
```

3.613 $\int \frac{\sqrt{d \sec(e+fx)}}{(a+b\tan(e+fx))^2}\,dx$

Optimal. Leaf size=430

$$-\frac{3a\sqrt{b}\sqrt{d\sec(e+fx)}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{2f\left(a^2+b^2\right)^{7/4}\sqrt[4]{\sec^2(e+fx)}}-\frac{3a\sqrt{b}\sqrt{d\sec(e+fx)}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{2f\left(a^2+b^2\right)^{7/4}\sqrt[4]{\sec^2(e+fx)}}-\frac{b\sqrt{d\sec(e+}{f\left(a^2+b^2\right)(a+b\,\mathrm{t}}$$

```
[Out] -(cos(1/2*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arctan(tan(f*x+e)))*Elliptic
F(sin(1/2*arctan(tan(f*x+e))),2^(1/2))*(d*sec(f*x+e))^(1/2)/(a^2+b^2)/f/(se
c(f*x+e)^2)^(1/4)-3/2*a*arctan((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4)
)*b^(1/2)*(d*sec(f*x+e))^(1/2)/(a^2+b^2)^(7/4)/f/(sec(f*x+e)^2)^(1/4)-3/2*a
*arctanh((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*b^(1/2)*(d*sec(f*x+e
))^(1/2)/(a^2+b^2)^(7/4)/f/(sec(f*x+e)^2)^(1/4)+3/2*a^2*cot(f*x+e)*Elliptic
Pi((sec(f*x+e)^2)^(1/4),-b/(a^2+b^2)^(1/2),I)*(d*sec(f*x+e))^(1/2)*(-tan(f*
x+e)^2)^(1/2)/(a^2+b^2)^2/f/(sec(f*x+e)^2)^(1/4)+3/2*a^2*cot(f*x+e)*Ellipti
cPi((sec(f*x+e)^2)^(1/4),b/(a^2+b^2)^(1/2),I)*(d*sec(f*x+e))^(1/2)*(-tan(f*
x+e)^2)^(1/2)/(a^2+b^2)^2/f/(sec(f*x+e)^2)^(1/4)-b*(d*sec(f*x+e))^(1/2)/(a^
2+b^2)/f/(a+b*tan(f*x+e))
```

Rubi [A] time = 0.38, antiderivative size = 430, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 15, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {3512, 745, 844, 231, 747, 401, 108, 409, 1213, 537, 444, 63, 212, 208, 205}

$$-\frac{3a\sqrt{b}\sqrt{d\sec(e+fx)}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{2f\left(a^2+b^2\right)^{7/4}\sqrt[4]{\sec^2(e+fx)}}-\frac{3a\sqrt{b}\sqrt{d\sec(e+fx)}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{2f\left(a^2+b^2\right)^{7/4}\sqrt[4]{\sec^2(e+fx)}}-\frac{b\sqrt{d\sec(e+}{f\left(a^2+b^2\right)(a+b\,\mathrm{t}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d*Sec[e + f*x]]/(a + b*Tan[e + f*x])^2,x]
```

```
[Out] (-3*a*Sqrt[b]*ArcTan[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*Sq
rt[d*Sec[e + f*x]])/(2*(a^2 + b^2)^(7/4)*f*(Sec[e + f*x]^2)^(1/4)) - (3*a*S
qrt[b]*ArcTanh[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*Sqrt[d*S
ec[e + f*x]])/(2*(a^2 + b^2)^(7/4)*f*(Sec[e + f*x]^2)^(1/4)) - (EllipticF[A
rcTan[Tan[e + f*x]]/2, 2]*Sqrt[d*Sec[e + f*x]])/((a^2 + b^2)*f*(Sec[e + f*x
]^2)^(1/4)) + (3*a^2*Cot[e + f*x]*EllipticPi[-(b/Sqrt[a^2 + b^2]), ArcSin[(
Sec[e + f*x]^2)^(1/4)], -1]*Sqrt[d*Sec[e + f*x]]*Sqrt[-Tan[e + f*x]^2])/(2*
(a^2 + b^2)^2*f*(Sec[e + f*x]^2)^(1/4)) + (3*a^2*Cot[e + f*x]*EllipticPi[b/
Sqrt[a^2 + b^2], ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*Sqrt[d*Sec[e + f*x]]*S
qrt[-Tan[e + f*x]^2])/(2*(a^2 + b^2)^2*f*(Sec[e + f*x]^2)^(1/4)) - (b*Sqrt[
d*Sec[e + f*x]])/((a^2 + b^2)*f*(a + b*Tan[e + f*x]))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 108

```
Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(
3/4)), x_Symbol] :> Dist[-4, Subst[Int[1/((b*e - a*f - b*x^4)*Sqrt[c - (d*e
)/f + (d*x^4)/f]), x], x, (e + f*x)^(1/4)], x] /; FreeQ[{a, b, c, d, e, f},
```

```
x] && GtQ[-(f/(d*e - c*f)), 0]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^4)^(-1), x_Symbol] :> With[{r = Numerator[Rt[-(a/b),
 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[r/(2*a), Int[1/(r - s*x^2), x],
 x] + Dist[r/(2*a), Int[1/(r + s*x^2), x], x]] /; FreeQ[{a, b}, x] &&  !GtQ
[a/b, 0]
```

Rule 231

```
Int[((a_) + (b_.)*(x_)^2)^(-3/4), x_Symbol] :> Simp[(2*EllipticF[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(3/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 401

```
Int[1/(((a_) + (b_.)*(x_)^2)^(3/4)*((c_) + (d_.)*(x_)^2)), x_Symbol] :> Dis
t[Sqrt[-((b*x^2)/a)]/(2*x), Subst[Int[1/(Sqrt[-((b*x)/a)]*(a + b*x)^(3/4)*(
c + d*x)), x], x, x^2], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 409

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^4]*((c_) + (d_.)*(x_)^4)), x_Symbol] :> Dist[
1/(2*c), Int[1/(Sqrt[a + b*x^4]*(1 - Rt[-(d/c), 2]*x^2)), x], x] + Dist[1/(
2*c), Int[1/(Sqrt[a + b*x^4]*(1 + Rt[-(d/c), 2]*x^2)), x], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] &&  !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] &&  !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 745

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/((m + 1)*(c*d^2 + a*e^2)), x] + D
ist[c/((m + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)*Simp[d*(m + 1) - e*(
m + 2*p + 3)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m, p}, x] &&
```

```
 NeQ[c*d^2 + a*e^2, 0] && NeQ[m, -1] && ((LtQ[m, -1] && IntQuadraticQ[a, 0,
 c, d, e, m, p, x]) || (SumSimplerQ[m, 1] && IntegerQ[p]) || ILtQ[Simplify[
m + 2*p + 3], 0])
```

Rule 747

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(3/4)), x_Symbol] :> Dist[
d, Int[1/((d^2 - e^2*x^2)*(a + c*x^2)^(3/4)), x], x] - Dist[e, Int[x/((d^2
- e^2*x^2)*(a + c*x^2)^(3/4)), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^
2 + a*e^2, 0]
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 1213

```
Int[1/(((d_) + (e_.)*(x_)^2)*Sqrt[(a_) + (c_.)*(x_)^4]), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[Sqrt[-c], Int[1/((d + e*x^2)*Sqrt[q + c*x^2]*Sqrt
[q - c*x^2]), x], x]] /; FreeQ[{a, c, d, e}, x] && GtQ[a, 0] && LtQ[c, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\sqrt{d \sec(e+fx)}}{(a+b\tan(e+fx))^2}\,dx = \frac{\sqrt{d\sec(e+fx)}\ \text{Subst}\left(\int \frac{1}{(a+x)^2\left(1+\frac{x^2}{b^2}\right)^{3/4}}\,dx, x, b\tan(e+fx)\right)}{bf\sqrt[4]{\sec^2(e+fx)}}$$

$$= -\frac{b\sqrt{d\sec(e+fx)}}{(a^2+b^2)\,f(a+b\tan(e+fx))} - \frac{\sqrt{d\sec(e+fx)}\ \text{Subst}\left(\int \frac{-a+\frac{x}{2}}{(a+x)\left(1+\frac{x^2}{b^2}\right)^{3/4}}\,dx, x, b\right.}{b\,(a^2+b^2)\,f\sqrt[4]{\sec^2(e+fx)}}$$

$$= -\frac{b\sqrt{d\sec(e+fx)}}{(a^2+b^2)\,f(a+b\tan(e+fx))} - \frac{\sqrt{d\sec(e+fx)}\ \text{Subst}\left(\int \frac{1}{\left(1+\frac{x^2}{b^2}\right)^{3/4}}\,dx, x, b\tan(\right.}{2b\,(a^2+b^2)\,f\sqrt[4]{\sec^2(e+fx)}}$$

$$= -\frac{F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{(a^2+b^2)\,f\sqrt[4]{\sec^2(e+fx)}} - \frac{b\sqrt{d\sec(e+fx)}}{(a^2+b^2)\,f(a+b\tan(e+fx))} -$$

$$= -\frac{F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{(a^2+b^2)\,f\sqrt[4]{\sec^2(e+fx)}} - \frac{b\sqrt{d\sec(e+fx)}}{(a^2+b^2)\,f(a+b\tan(e+fx))} -$$

$$= -\frac{F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{(a^2+b^2)\,f\sqrt[4]{\sec^2(e+fx)}} - \frac{b\sqrt{d\sec(e+fx)}}{(a^2+b^2)\,f(a+b\tan(e+fx))} -$$

$$= -\frac{F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{(a^2+b^2)\,f\sqrt[4]{\sec^2(e+fx)}} - \frac{b\sqrt{d\sec(e+fx)}}{(a^2+b^2)\,f(a+b\tan(e+fx))} -$$

$$= -\frac{3a\sqrt{b}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt{d\sec(e+fx)}}{2\,(a^2+b^2)^{7/4}\,f\sqrt[4]{\sec^2(e+fx)}} - \frac{3a\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt{}}{2\,(a^2+b^2)^{7/4}\,f\sqrt[4]{\sec^2(e}}$$

$$= -\frac{3a\sqrt{b}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt{d\sec(e+fx)}}{2\,(a^2+b^2)^{7/4}\,f\sqrt[4]{\sec^2(e+fx)}} - \frac{3a\sqrt{b}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt{}}{2\,(a^2+b^2)^{7/4}\,f\sqrt[4]{\sec^2(e}}$$

Mathematica [C] time = 26.92, size = 8876, normalized size = 20.64

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sqrt[d*Sec[e + f*x]]/(a + b*Tan[e + f*x])^2,x]
```

```
[Out] Result too large to show
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   catde
f: division by zero
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d\sec\left(fx+e\right)}}{\left(b\tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(d*sec(f*x + e))/(b*tan(f*x + e) + a)^2, x)
```

maple [B] time = 2.08, size = 14318, normalized size = 33.30

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))^2,x)
```

```
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d\sec\left(fx+e\right)}}{\left(b\tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))^2,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(d*sec(f*x + e))/(b*tan(f*x + e) + a)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\sqrt{\frac{d}{\cos\left(e+f\,x\right)}}}{{\left(a+b\,\tan\left(e+f\,x\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(1/2)/(a + b*tan(e + f*x))^2,x)
```

```
[Out] int((d/cos(e + f*x))^(1/2)/(a + b*tan(e + f*x))^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d\sec\left(e+fx\right)}}{\left(a+b\tan\left(e+fx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(1/2)/(a+b*tan(f*x+e))**2,x)
```

```
[Out] Integral(sqrt(d*sec(e + f*x))/(a + b*tan(e + f*x))**2, x)
```

3.614 $\int \frac{1}{\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^2}\,dx$

Optimal. Leaf size=555

$$\frac{b\left(2a^2-3b^2\right)\sec^2(e+fx)}{f\left(a^2+b^2\right)^2\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))}-\frac{\left(2a^2-3b^2\right)\tan(e+fx)}{f\left(a^2+b^2\right)^2\sqrt{d\sec(e+fx)}}+\frac{2(a\tan(e+fx)+\ldots}{f\left(a^2+b^2\right)\sqrt{d\sec(e+fx)}\,(a+\ldots}$$

```
[Out] 5/2*a*b^(3/2)*arctan((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(sec(f*x
+e)^2)^(1/4)/(a^2+b^2)^(9/4)/f/(d*sec(f*x+e))^(1/2)-5/2*a*b^(3/2)*arctanh((
sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(sec(f*x+e)^2)^(1/4)/(a^2+b^2)
^(9/4)/f/(d*sec(f*x+e))^(1/2)+(2*a^2-3*b^2)*(cos(1/2*arctan(tan(f*x+e)))^2)
^(1/2)/cos(1/2*arctan(tan(f*x+e)))*EllipticE(sin(1/2*arctan(tan(f*x+e))),2^
(1/2))*(sec(f*x+e)^2)^(1/4)/(a^2+b^2)^2/f/(d*sec(f*x+e))^(1/2)-5/2*a^2*b*co
t(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1/4),-b/(a^2+b^2)^(1/2),I)*(sec(f*x+e)^
2)^(1/4)*(-tan(f*x+e)^2)^(1/2)/(a^2+b^2)^(5/2)/f/(d*sec(f*x+e))^(1/2)+5/2*a
^2*b*cot(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1/4),b/(a^2+b^2)^(1/2),I)*(sec(f
*x+e)^2)^(1/4)*(-tan(f*x+e)^2)^(1/2)/(a^2+b^2)^(5/2)/f/(d*sec(f*x+e))^(1/2)
-(2*a^2-3*b^2)*tan(f*x+e)/(a^2+b^2)^2/f/(d*sec(f*x+e))^(1/2)+b*(2*a^2-3*b^2
)*sec(f*x+e)^2/(a^2+b^2)^2/f/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))+2*(b+a*t
an(f*x+e))/(a^2+b^2)/f/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))
```

Rubi [A] time = 0.54, antiderivative size = 555, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 16, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.640$, Rules used = {3512, 741, 835, 844, 227, 196, 746, 399, 490, 1213, 537, 444, 63, 298, 205, 208}

$$\frac{5ab^{3/2}\sqrt[4]{\sec^2(e+fx)}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{2f\left(a^2+b^2\right)^{9/4}\sqrt{d\sec(e+fx)}}+\frac{b\left(2a^2-3b^2\right)\sec^2(e+fx)}{f\left(a^2+b^2\right)^2\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))}-\frac{5ab^{3/2}\sqrt[4]{\sec^2(e+\ldots}}{2f\left(a^2+\ldots\right.}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x])^2),x]
```

```
[Out] (5*a*b^(3/2)*ArcTan[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*(Se
c[e + f*x]^2)^(1/4))/(2*(a^2 + b^2)^(9/4)*f*Sqrt[d*Sec[e + f*x]]) - (5*a*b^
(3/2)*ArcTanh[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*(Sec[e +
f*x]^2)^(1/4))/(2*(a^2 + b^2)^(9/4)*f*Sqrt[d*Sec[e + f*x]]) + ((2*a^2 - 3*b
^2)*EllipticE[ArcTan[Tan[e + f*x]]/2, 2]*(Sec[e + f*x]^2)^(1/4))/((a^2 + b^
2)^2*f*Sqrt[d*Sec[e + f*x]]) - ((2*a^2 - 3*b^2)*Tan[e + f*x])/((a^2 + b^2)^
2*f*Sqrt[d*Sec[e + f*x]]) - (5*a^2*b*Cot[e + f*x]*EllipticPi[-(b/Sqrt[a^2 +
 b^2]), ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*(Sec[e + f*x]^2)^(1/4)*Sqrt[-Ta
n[e + f*x]^2])/(2*(a^2 + b^2)^(5/2)*f*Sqrt[d*Sec[e + f*x]]) + (5*a^2*b*Cot[
e + f*x]*EllipticPi[b/Sqrt[a^2 + b^2], ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*
(Sec[e + f*x]^2)^(1/4)*Sqrt[-Tan[e + f*x]^2])/(2*(a^2 + b^2)^(5/2)*f*Sqrt[d
*Sec[e + f*x]]) + (b*(2*a^2 - 3*b^2)*Sec[e + f*x]^2)/((a^2 + b^2)^2*f*Sqrt[
d*Sec[e + f*x]]*(a + b*Tan[e + f*x])) + (2*(b + a*Tan[e + f*x]))/((a^2 + b^
2)*f*Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x]))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 196

```
Int[((a_) + (b_.)*(x_)^2)^(-5/4), x_Symbol] :> Simp[(2*EllipticE[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(5/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 227

```
Int[((a_) + (b_.)*(x_)^2)^(-1/4), x_Symbol] :> Simp[(2*x)/(a + b*x^2)^(1/4)
, x] - Dist[a, Int[1/(a + b*x^2)^(5/4), x], x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 298

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[-(a/b
), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s/(2*b), Int[1/(r + s*x^2), x
], x] - Dist[s/(2*b), Int[1/(r - s*x^2), x], x]] /; FreeQ[{a, b}, x] &&  !G
tQ[a/b, 0]
```

Rule 399

```
Int[1/(((a_) + (b_.)*(x_)^2)^(1/4)*((c_) + (d_.)*(x_)^2)), x_Symbol] :> Dis
t[(2*Sqrt[-((b*x^2)/a)])/x, Subst[Int[x^2/(Sqrt[1 - x^4/a]*(b*c - a*d + d*x
^4)), x], x, (a + b*x^2)^(1/4)], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c -
a*d, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 490

```
Int[(x_)^2/(((a_) + (b_.)*(x_)^4)*Sqrt[(c_) + (d_.)*(x_)^4]), x_Symbol] :>
With[{r = Numerator[Rt[-(a/b), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s
/(2*b), Int[1/((r + s*x^2)*Sqrt[c + d*x^4]), x], x] - Dist[s/(2*b), Int[1/(
(r - s*x^2)*Sqrt[c + d*x^4]), x], x]] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c
- a*d, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] &&  !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] &&  !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 741

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(a*e + c*d*x)*(a + c*x^2)^(p + 1))/(2*a*(p + 1)*(c*d^2
+ a*e^2)), x] + Dist[1/(2*a*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*Simp[
c*d^2*(2*p + 3) + a*e^2*(m + 2*p + 3) + c*e*d*(m + 2*p + 4)*x, x]*(a + c*x^
2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] &&
 LtQ[p, -1] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 746

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(1/4)), x_Symbol] :> Dist[
d, Int[1/((d^2 - e^2*x^2)*(a + c*x^2)^(1/4)), x], x] - Dist[e, Int[x/((d^2
- e^2*x^2)*(a + c*x^2)^(1/4)), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^
2 + a*e^2, 0]
```

Rule 835

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[((e*f - d*g)*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/
((m + 1)*(c*d^2 + a*e^2)), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d +
e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 +
a*e^2, 0] && LtQ[m, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*
p])
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 1213

```
Int[1/(((d_) + (e_.)*(x_)^2)*Sqrt[(a_) + (c_.)*(x_)^4]), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[Sqrt[-c], Int[1/((d + e*x^2)*Sqrt[q + c*x^2]*Sqrt
[q - c*x^2]), x], x]] /; FreeQ[{a, c, d, e}, x] && GtQ[a, 0] && LtQ[c, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{1}{\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^2}\,dx = \frac{\sqrt[4]{\sec^2(e+fx)}\ \text{Subst}\left(\int \frac{1}{(a+x)^2\left(1+\frac{x^2}{b^2}\right)^{5/4}}\,dx, x, b\tan(e+fx)\right)}{bf\sqrt{d\sec(e+fx)}}$$

$$= \frac{2(b+a\tan(e+fx))}{\left(a^2+b^2\right)f\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))} - \frac{\left(2b\sqrt[4]{\sec^2(e+fx)}\right)\ \cdots}{(a \cdots}$$

$$= \frac{b\left(2a^2-3b^2\right)\sec^2(e+fx)}{\left(a^2+b^2\right)^2 f\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))} + \frac{2(b+\cdots}{\left(a^2+b^2\right)f\sqrt{d\sec(\cdots}}$$

$$= \frac{b\left(2a^2-3b^2\right)\sec^2(e+fx)}{\left(a^2+b^2\right)^2 f\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))} + \frac{2(b+\cdots}{\left(a^2+b^2\right)f\sqrt{d\sec(\cdots}}$$

$$= -\frac{\left(2a^2-3b^2\right)\tan(e+fx)}{\left(a^2+b^2\right)^2 f\sqrt{d\sec(e+fx)}} + \frac{b\left(2a^2-3b^2\right)\sec^2(e+fx\cdots}{\left(a^2+b^2\right)^2 f\sqrt{d\sec(e+fx)}\,(a+b\,\text{ta}\cdots}$$

$$= \frac{\left(2a^2-3b^2\right)E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt[4]{\sec^2(e+fx)}}{\left(a^2+b^2\right)^2 f\sqrt{d\sec(e+fx)}} - \frac{\left(2a^2-3\cdots}{\left(a^2+b^2\right)^2\cdots}$$

$$= \frac{\left(2a^2-3b^2\right)E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt[4]{\sec^2(e+fx)}}{\left(a^2+b^2\right)^2 f\sqrt{d\sec(e+fx)}} - \frac{\left(2a^2-3\cdots}{\left(a^2+b^2\right)^2\cdots}$$

$$= \frac{\left(2a^2-3b^2\right)E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt[4]{\sec^2(e+fx)}}{\left(a^2+b^2\right)^2 f\sqrt{d\sec(e+fx)}} - \frac{\left(2a^2-3\cdots}{\left(a^2+b^2\right)^2\cdots}$$

$$= \frac{5ab^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt[4]{\sec^2(e+fx)}}{2\left(a^2+b^2\right)^{9/4} f\sqrt{d\sec(e+fx)}} - \frac{5ab^{3/2}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\text{se}\cdots}}{\sqrt[4]{a^{\cdots}}}\right.\cdots}{2\left(a^2+b^2\right)^{9/4}\cdots}$$

Mathematica [C] time = 33.44, size = 17812, normalized size = 32.09

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/(Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x])^2),x]
```

```
[Out] Result too large to show
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))^2,x, algorithm="fricas")
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{d \sec\left(fx+e\right)}\left(b \tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))^2,x, algorithm="giac")
[Out] integrate(1/(sqrt(d*sec(f*x + e))*(b*tan(f*x + e) + a)^2), x)
```

maple [B] time = 3.72, size = 38644, normalized size = 69.63

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))^2,x)
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{d \sec\left(fx+e\right)}\left(b \tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))^2,x, algorithm="maxima")
[Out] integrate(1/(sqrt(d*sec(f*x + e))*(b*tan(f*x + e) + a)^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{\sqrt{\frac{d}{\cos\left(e+f\,x\right)}}\,\left(a+b\,\tan\left(e+f\,x\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d/cos(e + f*x))^(1/2)*(a + b*tan(e + f*x))^2),x)
[Out] int(1/((d/cos(e + f*x))^(1/2)*(a + b*tan(e + f*x))^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{d \sec\left(e+fx\right)}\left(a+b \tan\left(e+fx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))**(1/2)/(a+b*tan(f*x+e))**2,x)
[Out] Integral(1/(sqrt(d*sec(e + f*x))*(a + b*tan(e + f*x))**2), x)
```

3.615 $\int \frac{1}{(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))^2}\,dx$

Optimal. Leaf size=520

$$\frac{b\left(2a^2-5b^2\right)\sec^2(e+fx)}{3f\left(a^2+b^2\right)^2(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))}+\frac{2(a\tan(e+fx)+b)}{3f\left(a^2+b^2\right)(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))}+\frac{\left(2a^2-5b^2\right.}{}$$

```
[Out] -7/2*a*b^(5/2)*arctan((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(sec(f*
x+e)^2)^(3/4)/(a^2+b^2)^(11/4)/f/(d*sec(f*x+e))^(3/2)-7/2*a*b^(5/2)*arctanh
((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(sec(f*x+e)^2)^(3/4)/(a^2+b^
2)^(11/4)/f/(d*sec(f*x+e))^(3/2)+1/3*(2*a^2-5*b^2)*(cos(1/2*arctan(tan(f*x+
e)))^2)^(1/2)/cos(1/2*arctan(tan(f*x+e)))*EllipticF(sin(1/2*arctan(tan(f*x+
e))),2^(1/2))*(sec(f*x+e)^2)^(3/4)/(a^2+b^2)^2/f/(d*sec(f*x+e))^(3/2)+7/2*a
^2*b^2*cot(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1/4),-b/(a^2+b^2)^(1/2),I)*(se
c(f*x+e)^2)^(3/4)*(-tan(f*x+e)^2)^(1/2)/(a^2+b^2)^3/f/(d*sec(f*x+e))^(3/2)+
7/2*a^2*b^2*cot(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1/4),b/(a^2+b^2)^(1/2),I)
*(sec(f*x+e)^2)^(3/4)*(-tan(f*x+e)^2)^(1/2)/(a^2+b^2)^3/f/(d*sec(f*x+e))^(3
/2)+1/3*b*(2*a^2-5*b^2)*sec(f*x+e)^2/(a^2+b^2)^2/f/(d*sec(f*x+e))^(3/2)/(a+
b*tan(f*x+e))+2/3*(b+a*tan(f*x+e))/(a^2+b^2)/f/(d*sec(f*x+e))^(3/2)/(a+b*ta
n(f*x+e))
```

Rubi [A] time = 0.57, antiderivative size = 520, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 16, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.640, Rules used = {3512, 741, 835, 844, 231, 747, 401, 108, 409, 1213, 537, 444, 63, 212, 208, 205}

$$-\frac{7ab^{5/2}\sec^2(e+fx)^{3/4}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{2f\left(a^2+b^2\right)^{11/4}(d\sec(e+fx))^{3/2}}+\frac{b\left(2a^2-5b^2\right)\sec^2(e+fx)}{3f\left(a^2+b^2\right)^2(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))}-\frac{7ab^{5/2}\sec^2(e}{2f\left(a^2+\right.}$$

Antiderivative was successfully verified.

```
[In] Int[1/((d*Sec[e + f*x])^(3/2)*(a + b*Tan[e + f*x])^2),x]
```

```
[Out] (-7*a*b^(5/2)*ArcTan[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*(S
ec[e + f*x]^2)^(3/4))/(2*(a^2 + b^2)^(11/4)*f*(d*Sec[e + f*x])^(3/2)) - (7*
a*b^(5/2)*ArcTanh[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*(Sec[
e + f*x]^2)^(3/4))/(2*(a^2 + b^2)^(11/4)*f*(d*Sec[e + f*x])^(3/2)) + ((2*a^
2 - 5*b^2)*EllipticF[ArcTan[Tan[e + f*x]]/2, 2]*(Sec[e + f*x]^2)^(3/4))/(3*
(a^2 + b^2)^2*f*(d*Sec[e + f*x])^(3/2)) + (7*a^2*b^2*Cot[e + f*x]*EllipticP
i[-(b/Sqrt[a^2 + b^2]), ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*(Sec[e + f*x]^2
)^(3/4)*Sqrt[-Tan[e + f*x]^2])/(2*(a^2 + b^2)^3*f*(d*Sec[e + f*x])^(3/2)) +
 (7*a^2*b^2*Cot[e + f*x]*EllipticPi[b/Sqrt[a^2 + b^2], ArcSin[(Sec[e + f*x]
^2)^(1/4)], -1]*(Sec[e + f*x]^2)^(3/4)*Sqrt[-Tan[e + f*x]^2])/(2*(a^2 + b^2
)^3*f*(d*Sec[e + f*x])^(3/2)) + (b*(2*a^2 - 5*b^2)*Sec[e + f*x]^2)/(3*(a^2
+ b^2)^2*f*(d*Sec[e + f*x])^(3/2)*(a + b*Tan[e + f*x])) + (2*(b + a*Tan[e +
 f*x]))/(3*(a^2 + b^2)*f*(d*Sec[e + f*x])^(3/2)*(a + b*Tan[e + f*x]))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 108

```
Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(
3/4)), x_Symbol] :> Dist[-4, Subst[Int[1/((b*e - a*f - b*x^4)*Sqrt[c - (d*e
)/f + (d*x^4)/f]), x], x, (e + f*x)^(1/4)], x] /; FreeQ[{a, b, c, d, e, f},
 x] && GtQ[-(f/(d*e - c*f)), 0]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^4)^(-1), x_Symbol] :> With[{r = Numerator[Rt[-(a/b),
 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[r/(2*a), Int[1/(r - s*x^2), x],
 x] + Dist[r/(2*a), Int[1/(r + s*x^2), x], x]] /; FreeQ[{a, b}, x] &&  !GtQ
[a/b, 0]
```

Rule 231

```
Int[((a_) + (b_.)*(x_)^2)^(-3/4), x_Symbol] :> Simp[(2*EllipticF[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(3/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 401

```
Int[1/(((a_) + (b_.)*(x_)^2)^(3/4)*((c_) + (d_.)*(x_)^2)), x_Symbol] :> Dis
t[Sqrt[-((b*x^2)/a)]/(2*x), Subst[Int[1/(Sqrt[-((b*x)/a)]*(a + b*x)^(3/4)*(
c + d*x)), x], x, x^2], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 409

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^4]*((c_) + (d_.)*(x_)^4)), x_Symbol] :> Dist[
1/(2*c), Int[1/(Sqrt[a + b*x^4]*(1 - Rt[-(d/c), 2]*x^2)), x], x] + Dist[1/(
2*c), Int[1/(Sqrt[a + b*x^4]*(1 + Rt[-(d/c), 2]*x^2)), x], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] &&  !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] &&  !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 741

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(a*e + c*d*x)*(a + c*x^2)^(p + 1))/(2*a*(p + 1)*(c*d^2
+ a*e^2)), x] + Dist[1/(2*a*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*Simp[
c*d^2*(2*p + 3) + a*e^2*(m + 2*p + 3) + c*e*d*(m + 2*p + 4)*x, x]*(a + c*x^
2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] &&
 LtQ[p, -1] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 747

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(3/4)), x_Symbol] :> Dist[
d, Int[1/((d^2 - e^2*x^2)*(a + c*x^2)^(3/4)), x], x] - Dist[e, Int[x/((d^2
- e^2*x^2)*(a + c*x^2)^(3/4)), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^
2 + a*e^2, 0]
```

Rule 835

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[((e*f - d*g)*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/
((m + 1)*(c*d^2 + a*e^2)), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d +
e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 +
a*e^2, 0] && LtQ[m, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*
p])
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 1213

```
Int[1/(((d_) + (e_.)*(x_)^2)*Sqrt[(a_) + (c_.)*(x_)^4]), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[Sqrt[-c], Int[1/((d + e*x^2)*Sqrt[q + c*x^2]*Sqrt
[q - c*x^2]), x], x]] /; FreeQ[{a, c, d, e}, x] && GtQ[a, 0] && LtQ[c, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{1}{(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))^2}\,dx = \frac{\sec^2(e+fx)^{3/4}\,\mathrm{Subst}\left(\int \frac{1}{(a+x)^2\left(1+\frac{x^2}{b^2}\right)^{7/4}}\,dx, x, b\tan(e+fx)\right)}{bf(d\sec(e+fx))^{3/2}}$$

$$= \frac{2(b+a\tan(e+fx))}{3\left(a^2+b^2\right)f(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))} - \frac{\left(2b\sec^2(e+\right.}{}$$

$$= \frac{b\left(2a^2-5b^2\right)\sec^2(e+fx)}{3\left(a^2+b^2\right)^2 f(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))} + \frac{}{3\left(a^2+b^2\right.}$$

$$= \frac{b\left(2a^2-5b^2\right)\sec^2(e+fx)}{3\left(a^2+b^2\right)^2 f(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))} + \frac{}{3\left(a^2+b^2\right.}$$

$$= \frac{\left(2a^2-5b^2\right)F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sec^2(e+fx)^{3/4}}{3\left(a^2+b^2\right)^2 f(d\sec(e+fx))^{3/2}} + \frac{}{3\left(a^2\right.}$$

$$= \frac{\left(2a^2-5b^2\right)F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sec^2(e+fx)^{3/4}}{3\left(a^2+b^2\right)^2 f(d\sec(e+fx))^{3/2}} + \frac{}{3\left(a^2\right.}$$

$$= \frac{\left(2a^2-5b^2\right)F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sec^2(e+fx)^{3/4}}{3\left(a^2+b^2\right)^2 f(d\sec(e+fx))^{3/2}} + \frac{}{3\left(a^2\right.}$$

$$= \frac{\left(2a^2-5b^2\right)F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sec^2(e+fx)^{3/4}}{3\left(a^2+b^2\right)^2 f(d\sec(e+fx))^{3/2}} + \frac{}{3\left(a^2\right.}$$

$$= -\frac{7ab^{5/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sec^2(e+fx)^{3/4}}{2\left(a^2+b^2\right)^{11/4}f(d\sec(e+fx))^{3/2}} - \frac{7ab^{5/2}\tanh^{-1}\left(\right.}{2\left(a^2+b^2\right.}$$

$$= -\frac{7ab^{5/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sec^2(e+fx)^{3/4}}{2\left(a^2+b^2\right)^{11/4}f(d\sec(e+fx))^{3/2}} - \frac{7ab^{5/2}\tanh^{-1}\left(\right.}{2\left(a^2+b^2\right.}$$

Mathematica [C] time = 28.02, size = 11962, normalized size = 23.00

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/((d*Sec[e + f*x])^(3/2)*(a + b*Tan[e + f*x])^2),x]
```

```
[Out] Result too large to show
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e))^2,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(fx+e\right)\right)^{\frac{3}{2}}\left(b\tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((d*sec(f*x + e))^(3/2)*(b*tan(f*x + e) + a)^2), x)
```

maple [B] time = 2.24, size = 15455, normalized size = 29.72

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e))^2,x)
```

```
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(fx+e\right)\right)^{\frac{3}{2}}\left(b\tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e))^2,x, algorithm="maxima")
```

```
[Out] integrate(1/((d*sec(f*x + e))^(3/2)*(b*tan(f*x + e) + a)^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{3/2}\,{\left(a+b\,\tan\left(e+f\,x\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d/cos(e + f*x))^(3/2)*(a + b*tan(e + f*x))^2),x)
```

```
[Out] int(1/((d/cos(e + f*x))^(3/2)*(a + b*tan(e + f*x))^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(e+fx\right)\right)^{\frac{3}{2}}\left(a+b\tan\left(e+fx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))**(3/2)/(a+b*tan(f*x+e))**2,x)
```

```
[Out] Integral(1/((d*sec(e + f*x))**(3/2)*(a + b*tan(e + f*x))**2), x)
```

3.616 $\int \frac{1}{(d\sec(e+fx))^{5/2}(a+b\tan(e+fx))^2}\,dx$

Optimal. Leaf size=700

$$-\frac{2\left(b\left(2a^2-7b^2\right)-3a\left(a^2+4b^2\right)\tan(e+fx)\right)}{5d^2f\left(a^2+b^2\right)^2\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))}+\frac{2\cos^2(e+fx)(a\tan(e+fx)+b)}{5d^2f\left(a^2+b^2\right)\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))}+\frac{9ab^{7/2}\sqrt[4]{\ldots}}{2d^2\ldots}$$

```
[Out] 9/2*a*b^(7/2)*arctan((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(sec(f*x
+e)^2)^(1/4)/(a^2+b^2)^(13/4)/d^2/f/(d*sec(f*x+e))^(1/2)-9/2*a*b^(7/2)*arct
anh((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(sec(f*x+e)^2)^(1/4)/(a^2
+b^2)^(13/4)/d^2/f/(d*sec(f*x+e))^(1/2)+3/5*(2*a^4+10*a^2*b^2-7*b^4)*(cos(1
/2*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arctan(tan(f*x+e)))*EllipticE(sin(1
/2*arctan(tan(f*x+e))),2^(1/2))*(sec(f*x+e)^2)^(1/4)/(a^2+b^2)^3/d^2/f/(d*s
ec(f*x+e))^(1/2)-9/2*a^2*b^3*cot(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1/4),-b/
(a^2+b^2)^(1/2),I)*(sec(f*x+e)^2)^(1/4)*(-tan(f*x+e)^2)^(1/2)/(a^2+b^2)^(7/
2)/d^2/f/(d*sec(f*x+e))^(1/2)+9/2*a^2*b^3*cot(f*x+e)*EllipticPi((sec(f*x+e)
^2)^(1/4),b/(a^2+b^2)^(1/2),I)*(sec(f*x+e)^2)^(1/4)*(-tan(f*x+e)^2)^(1/2)/(
a^2+b^2)^(7/2)/d^2/f/(d*sec(f*x+e))^(1/2)-3/5*(2*a^4+10*a^2*b^2-7*b^4)*tan(
f*x+e)/(a^2+b^2)^3/d^2/f/(d*sec(f*x+e))^(1/2)+3/5*b*(2*a^4+10*a^2*b^2-7*b^4
)*sec(f*x+e)^2/(a^2+b^2)^3/d^2/f/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))+2/5*
cos(f*x+e)^2*(b+a*tan(f*x+e))/(a^2+b^2)/d^2/f/(d*sec(f*x+e))^(1/2)/(a+b*tan
(f*x+e))-2/5*(b*(2*a^2-7*b^2)-3*a*(a^2+4*b^2)*tan(f*x+e))/(a^2+b^2)^2/d^2/f
/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))
```

Rubi [A] time = 0.71, antiderivative size = 700, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 17, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.680, Rules used = {3512, 741, 823, 835, 844, 227, 196, 746, 399, 490, 1213, 537, 444, 63, 298, 205, 208}

$$\frac{9ab^{7/2}\sqrt[4]{\sec^2(e+fx)}\,\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{2d^2f\left(a^2+b^2\right)^{13/4}\sqrt{d\sec(e+fx)}}+\frac{3b\left(10a^2b^2+2a^4-7b^4\right)\sec^2(e+fx)}{5d^2f\left(a^2+b^2\right)^3\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))}-\frac{9ab^{7/2}\sqrt[4]{\sec^2(e\ldots}}{2d^2f\left(a^2+\ldots\right.}$$

Antiderivative was successfully verified.

```
[In] Int[1/((d*Sec[e + f*x])^(5/2)*(a + b*Tan[e + f*x])^2),x]
```

```
[Out] (9*a*b^(7/2)*ArcTan[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*(Se
c[e + f*x]^2)^(1/4))/(2*(a^2 + b^2)^(13/4)*d^2*f*Sqrt[d*Sec[e + f*x]]) - (9
*a*b^(7/2)*ArcTanh[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]*(Sec
[e + f*x]^2)^(1/4))/(2*(a^2 + b^2)^(13/4)*d^2*f*Sqrt[d*Sec[e + f*x]]) + (3*
(2*a^4 + 10*a^2*b^2 - 7*b^4)*EllipticE[ArcTan[Tan[e + f*x]]/2, 2]*(Sec[e +
f*x]^2)^(1/4))/(5*(a^2 + b^2)^3*d^2*f*Sqrt[d*Sec[e + f*x]]) - (3*(2*a^4 + 1
0*a^2*b^2 - 7*b^4)*Tan[e + f*x])/(5*(a^2 + b^2)^3*d^2*f*Sqrt[d*Sec[e + f*x]
]) - (9*a^2*b^3*Cot[e + f*x]*EllipticPi[-(b/Sqrt[a^2 + b^2]), ArcSin[(Sec[e
 + f*x]^2)^(1/4)], -1]*(Sec[e + f*x]^2)^(1/4)*Sqrt[-Tan[e + f*x]^2])/(2*(a^
2 + b^2)^(7/2)*d^2*f*Sqrt[d*Sec[e + f*x]]) + (9*a^2*b^3*Cot[e + f*x]*Ellipt
icPi[b/Sqrt[a^2 + b^2], ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*(Sec[e + f*x]^2
)^(1/4)*Sqrt[-Tan[e + f*x]^2])/(2*(a^2 + b^2)^(7/2)*d^2*f*Sqrt[d*Sec[e + f*
x]]) + (3*b*(2*a^4 + 10*a^2*b^2 - 7*b^4)*Sec[e + f*x]^2)/(5*(a^2 + b^2)^3*d
^2*f*Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x])) + (2*Cos[e + f*x]^2*(b + a*
Tan[e + f*x]))/(5*(a^2 + b^2)*d^2*f*Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x
])) - (2*(b*(2*a^2 - 7*b^2) - 3*a*(a^2 + 4*b^2)*Tan[e + f*x]))/(5*(a^2 + b^
2)^2*d^2*f*Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x]))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 196

```
Int[((a_) + (b_.)*(x_)^2)^(-5/4), x_Symbol] :> Simp[(2*EllipticE[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(5/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 227

```
Int[((a_) + (b_.)*(x_)^2)^(-1/4), x_Symbol] :> Simp[(2*x)/(a + b*x^2)^(1/4)
, x] - Dist[a, Int[1/(a + b*x^2)^(5/4), x], x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 298

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[-(a/b
), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s/(2*b), Int[1/(r + s*x^2), x
], x] - Dist[s/(2*b), Int[1/(r - s*x^2), x], x]] /; FreeQ[{a, b}, x] &&  !G
tQ[a/b, 0]
```

Rule 399

```
Int[1/(((a_) + (b_.)*(x_)^2)^(1/4)*((c_) + (d_.)*(x_)^2)), x_Symbol] :> Dis
t[(2*Sqrt[-((b*x^2)/a)])/x, Subst[Int[x^2/(Sqrt[1 - x^4/a]*(b*c - a*d + d*x
^4)), x], x, (a + b*x^2)^(1/4)], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c -
a*d, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 490

```
Int[(x_)^2/(((a_) + (b_.)*(x_)^4)*Sqrt[(c_) + (d_.)*(x_)^4]), x_Symbol] :>
With[{r = Numerator[Rt[-(a/b), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s
/(2*b), Int[1/((r + s*x^2)*Sqrt[c + d*x^4]), x], x] - Dist[s/(2*b), Int[1/(
(r - s*x^2)*Sqrt[c + d*x^4]), x], x]] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c
- a*d, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] &&  !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] &&  !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 741

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(a*e + c*d*x)*(a + c*x^2)^(p + 1))/(2*a*(p + 1)*(c*d^2
+ a*e^2)), x] + Dist[1/(2*a*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*Simp[
c*d^2*(2*p + 3) + a*e^2*(m + 2*p + 3) + c*e*d*(m + 2*p + 4)*x, x]*(a + c*x^
2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] &&
 LtQ[p, -1] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 746

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(1/4)), x_Symbol] :> Dist[
d, Int[1/((d^2 - e^2*x^2)*(a + c*x^2)^(1/4)), x], x] - Dist[e, Int[x/((d^2
- e^2*x^2)*(a + c*x^2)^(1/4)), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^
2 + a*e^2, 0]
```

Rule 823

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_), x_Symbol] :> -Simp[((d + e*x)^(m + 1)*(f*a*c*e - a*g*c*d + c*(c*d*f + a
*e*g)*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)*(c*d^2 + a*e^2)), x] + Dist[1/
(2*a*c*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*(a + c*x^2)^(p + 1)*Simp[f
*(c^2*d^2*(2*p + 3) + a*c*e^2*(m + 2*p + 3)) - a*c*d*e*g*m + c*e*(c*d*f + a
*e*g)*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*
d^2 + a*e^2, 0] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2
*m, 2*p])
```

Rule 835

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[((e*f - d*g)*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/
((m + 1)*(c*d^2 + a*e^2)), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d +
e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 +
a*e^2, 0] && LtQ[m, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*
p])
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 1213

```
Int[1/(((d_) + (e_.)*(x_)^2)*Sqrt[(a_) + (c_.)*(x_)^4]), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[Sqrt[-c], Int[1/((d + e*x^2)*Sqrt[q + c*x^2]*Sqrt
[q - c*x^2]), x], x]] /; FreeQ[{a, c, d, e}, x] && GtQ[a, 0] && LtQ[c, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
```

```
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{1}{(d\sec(e+fx))^{5/2}(a+b\tan(e+fx))^2}\,dx = \frac{\sqrt[4]{\sec^2(e+fx)}\,\text{Subst}\left(\int \frac{1}{(a+x)^2\left(1+\frac{x^2}{b^2}\right)^{9/4}}\,dx, x, b\tan(e+fx)\right)}{bd^2f\sqrt{d\sec(e+fx)}}$$

$$= \frac{2\cos^2(e+fx)(b+a\tan(e+fx))}{5\left(a^2+b^2\right)d^2f\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))} - \frac{\left(2b\sqrt[4]{\sec^2(\right.}{}$$

$$= \frac{2\cos^2(e+fx)(b+a\tan(e+fx))}{5\left(a^2+b^2\right)d^2f\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))} - \frac{2\left(b\left(2a^2\right.\right.}{5\left(a^2+b^2\right)}$$

$$= \frac{3b\left(2a^4+10a^2b^2-7b^4\right)\sec^2(e+fx)}{5\left(a^2+b^2\right)^3 d^2f\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))} + \frac{2}{5\left(a^2+b^2\right.}$$

$$= \frac{3b\left(2a^4+10a^2b^2-7b^4\right)\sec^2(e+fx)}{5\left(a^2+b^2\right)^3 d^2f\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))} + \frac{2}{5\left(a^2+b^2\right.}$$

$$= -\frac{3\left(2a^4+10a^2b^2-7b^4\right)\tan(e+fx)}{5\left(a^2+b^2\right)^3 d^2f\sqrt{d\sec(e+fx)}} + \frac{3b\left(2a^4+10a^2b^2\right.}{5\left(a^2+b^2\right)^3 d^2f\sqrt{d\sec(\right.}$$

$$= \frac{3\left(2a^4+10a^2b^2-7b^4\right)E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt[4]{\sec^2(e+f}}{5\left(a^2+b^2\right)^3 d^2f\sqrt{d\sec(e+fx)}}$$

$$= \frac{3\left(2a^4+10a^2b^2-7b^4\right)E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt[4]{\sec^2(e+f}}{5\left(a^2+b^2\right)^3 d^2f\sqrt{d\sec(e+fx)}}$$

$$= \frac{3\left(2a^4+10a^2b^2-7b^4\right)E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt[4]{\sec^2(e+f}}{5\left(a^2+b^2\right)^3 d^2f\sqrt{d\sec(e+fx)}}$$

$$= \frac{9ab^{7/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt[4]{\sec^2(e+fx)}}{2\left(a^2+b^2\right)^{13/4}d^2f\sqrt{d\sec(e+fx)}} - \frac{9ab^{7/2}\tanh^{-1}\left(\frac{\sqrt{}}{}\right.}{2\left(a^2+b^2\right)}$$

Mathematica [C] time = 32.97, size = 18542, normalized size = 26.49

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/((d*Sec[e + f*x])^(5/2)*(a + b*Tan[e + f*x])^2),x]
[Out] Result too large to show
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e))^2,x, algorithm="fricas")
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d \sec\left(fx+e\right)\right)^{\frac{5}{2}} \left(b \tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e))^2,x, algorithm="giac")
[Out] integrate(1/((d*sec(f*x + e))^(5/2)*(b*tan(f*x + e) + a)^2), x)
```

maple [B] time = 4.16, size = 44337, normalized size = 63.34

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e))^2,x)
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d \sec\left(fx+e\right)\right)^{\frac{5}{2}} \left(b \tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e))^2,x, algorithm="maxima")
[Out] integrate(1/((d*sec(f*x + e))^(5/2)*(b*tan(f*x + e) + a)^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{5/2}\,{\left(a+b\,\tan\left(e+f\,x\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d/cos(e + f*x))^(5/2)*(a + b*tan(e + f*x))^2),x)
```

```
[Out] int(1/((d/cos(e + f*x))^(5/2)*(a + b*tan(e + f*x))^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(e+fx\right)\right)^{\frac{5}{2}}\left(a+b\tan\left(e+fx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))**(5/2)/(a+b*tan(f*x+e))**2,x)
```

```
[Out] Integral(1/((d*sec(e + f*x))**(5/2)*(a + b*tan(e + f*x))**2), x)
```

3.617 $\int \frac{(d\sec(e+fx))^{7/2}}{(a+b\tan(e+fx))^3}\,dx$

Optimal. Leaf size=583

$$\frac{3ad^2(d\sec(e+fx))^{3/2}}{4bf\left(a^2+b^2\right)(a+b\tan(e+fx))}-\frac{3ad^2\sin(e+fx)\cos(e+fx)(d\sec(e+fx))^{3/2}}{4b^2f\left(a^2+b^2\right)}+\frac{3ad^2(d\sec(e+fx))^{3/2}E\left(\frac{1}{2}\tan\right.}{4b^2f\left(a^2+b^2\right)\sec^2(}$$

```
[Out] 3/8*(a^2+2*b^2)*d^2*arctan((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(d
*sec(f*x+e))^(3/2)/b^(5/2)/(a^2+b^2)^(5/4)/f/(sec(f*x+e)^2)^(3/4)-3/8*(a^2+
2*b^2)*d^2*arctanh((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(d*sec(f*x
+e))^(3/2)/b^(5/2)/(a^2+b^2)^(5/4)/f/(sec(f*x+e)^2)^(3/4)+3/4*a*d^2*(cos(1/
2*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arctan(tan(f*x+e)))*EllipticE(sin(1/
2*arctan(tan(f*x+e))),2^(1/2))*(d*sec(f*x+e))^(3/2)/b^2/(a^2+b^2)/f/(sec(f*
x+e)^2)^(3/4)-3/4*a*d^2*cos(f*x+e)*(d*sec(f*x+e))^(3/2)*sin(f*x+e)/b^2/(a^2
+b^2)/f-3/8*a*(a^2+2*b^2)*d^2*cot(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1/4),-b
/(a^2+b^2)^(1/2),I)*(d*sec(f*x+e))^(3/2)*(-tan(f*x+e)^2)^(1/2)/b^3/(a^2+b^2
)^(3/2)/f/(sec(f*x+e)^2)^(3/4)+3/8*a*(a^2+2*b^2)*d^2*cot(f*x+e)*EllipticPi(
(sec(f*x+e)^2)^(1/4),b/(a^2+b^2)^(1/2),I)*(d*sec(f*x+e))^(3/2)*(-tan(f*x+e)
^2)^(1/2)/b^3/(a^2+b^2)^(3/2)/f/(sec(f*x+e)^2)^(3/4)-1/2*d^2*(d*sec(f*x+e))
^(3/2)/b/f/(a+b*tan(f*x+e))^2+3/4*a*d^2*(d*sec(f*x+e))^(3/2)/b/(a^2+b^2)/f/
(a+b*tan(f*x+e))
```

Rubi [A] time = 0.52, antiderivative size = 583, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 16, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.640, Rules used = {3512, 733, 835, 844, 227, 196, 746, 399, 490, 1213, 537, 444, 63, 298, 205, 208}

$$\frac{3d^2\left(a^2+2b^2\right)(d\sec(e+fx))^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{8b^{5/2}f\left(a^2+b^2\right)^{5/4}\sec^2(e+fx)^{3/4}}-\frac{3d^2\left(a^2+2b^2\right)(d\sec(e+fx))^{3/2}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{8b^{5/2}f\left(a^2+b^2\right)^{5/4}\sec^2(e+fx)^{3/4}}-$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(7/2)/(a + b*Tan[e + f*x])^3,x]
```

```
[Out] (3*(a^2 + 2*b^2)*d^2*ArcTan[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1
/4)]*(d*Sec[e + f*x])^(3/2))/(8*b^(5/2)*(a^2 + b^2)^(5/4)*f*(Sec[e + f*x]^2
)^(3/4)) - (3*(a^2 + 2*b^2)*d^2*ArcTanh[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a
^2 + b^2)^(1/4)]*(d*Sec[e + f*x])^(3/2))/(8*b^(5/2)*(a^2 + b^2)^(5/4)*f*(Se
c[e + f*x]^2)^(3/4)) + (3*a*d^2*EllipticE[ArcTan[Tan[e + f*x]]/2, 2]*(d*Sec
[e + f*x])^(3/2))/(4*b^2*(a^2 + b^2)*f*(Sec[e + f*x]^2)^(3/4)) - (3*a*d^2*C
os[e + f*x]*(d*Sec[e + f*x])^(3/2)*Sin[e + f*x])/(4*b^2*(a^2 + b^2)*f) - (3
*a*(a^2 + 2*b^2)*d^2*Cot[e + f*x]*EllipticPi[-(b/Sqrt[a^2 + b^2]), ArcSin[(
Sec[e + f*x]^2)^(1/4)], -1]*(d*Sec[e + f*x])^(3/2)*Sqrt[-Tan[e + f*x]^2])/(
8*b^3*(a^2 + b^2)^(3/2)*f*(Sec[e + f*x]^2)^(3/4)) + (3*a*(a^2 + 2*b^2)*d^2*
Cot[e + f*x]*EllipticPi[b/Sqrt[a^2 + b^2], ArcSin[(Sec[e + f*x]^2)^(1/4)],
-1]*(d*Sec[e + f*x])^(3/2)*Sqrt[-Tan[e + f*x]^2])/(8*b^3*(a^2 + b^2)^(3/2)*
f*(Sec[e + f*x]^2)^(3/4)) - (d^2*(d*Sec[e + f*x])^(3/2))/(2*b*f*(a + b*Tan[
e + f*x])^2) + (3*a*d^2*(d*Sec[e + f*x])^(3/2))/(4*b*(a^2 + b^2)*f*(a + b*T
an[e + f*x]))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
```

```
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 196

```
Int[((a_) + (b_.)*(x_)^2)^(-5/4), x_Symbol] :> Simp[(2*EllipticE[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(5/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 227

```
Int[((a_) + (b_.)*(x_)^2)^(-1/4), x_Symbol] :> Simp[(2*x)/(a + b*x^2)^(1/4)
, x] - Dist[a, Int[1/(a + b*x^2)^(5/4), x], x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 298

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[-(a/b
), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s/(2*b), Int[1/(r + s*x^2), x
], x] - Dist[s/(2*b), Int[1/(r - s*x^2), x], x]] /; FreeQ[{a, b}, x] &&  !G
tQ[a/b, 0]
```

Rule 399

```
Int[1/(((a_) + (b_.)*(x_)^2)^(1/4)*((c_) + (d_.)*(x_)^2)), x_Symbol] :> Dis
t[(2*Sqrt[-((b*x^2)/a)])/x, Subst[Int[x^2/(Sqrt[1 - x^4/a]*(b*c - a*d + d*x
^4)), x], x, (a + b*x^2)^(1/4)], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c -
a*d, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 490

```
Int[(x_)^2/(((a_) + (b_.)*(x_)^4)*Sqrt[(c_) + (d_.)*(x_)^4]), x_Symbol] :>
With[{r = Numerator[Rt[-(a/b), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s
/(2*b), Int[1/((r + s*x^2)*Sqrt[c + d*x^4]), x], x] - Dist[s/(2*b), Int[1/(
(r - s*x^2)*Sqrt[c + d*x^4]), x], x]] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c
- a*d, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)]]/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] &&  !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] &&  !( !GtQ[f/e, 0]
```

```
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 733

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m + 1)*(a + c*x^2)^p)/(e*(m + 1)), x] - Dist[(2*c*p)/(e*(m + 1)
), Int[x*(d + e*x)^(m + 1)*(a + c*x^2)^(p - 1), x], x] /; FreeQ[{a, c, d, e
, m}, x] && NeQ[c*d^2 + a*e^2, 0] && GtQ[p, 0] && (IntegerQ[p] || LtQ[m, -1
]) && NeQ[m, -1] &&  !ILtQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e,
m, p, x]
```

Rule 746

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(1/4)), x_Symbol] :> Dist[
d, Int[1/((d^2 - e^2*x^2)*(a + c*x^2)^(1/4)), x], x] - Dist[e, Int[x/((d^2
- e^2*x^2)*(a + c*x^2)^(1/4)), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^
2 + a*e^2, 0]
```

Rule 835

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[((e*f - d*g)*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/
((m + 1)*(c*d^2 + a*e^2)), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d +
e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 +
a*e^2, 0] && LtQ[m, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*
p])
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 1213

```
Int[1/(((d_) + (e_.)*(x_)^2)*Sqrt[(a_) + (c_.)*(x_)^4]), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[Sqrt[-c], Int[1/((d + e*x^2)*Sqrt[q + c*x^2]*Sqrt
[q - c*x^2]), x], x]] /; FreeQ[{a, c, d, e}, x] && GtQ[a, 0] && LtQ[c, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{(d\sec(e+fx))^{7/2}}{(a+b\tan(e+fx))^3}\,dx = \frac{\left(d^2(d\sec(e+fx))^{3/2}\right)\text{Subst}\left(\int \frac{\left(1+\frac{x^2}{b^2}\right)^{3/4}}{(a+x)^3}\,dx, x, b\tan(e+fx)\right)}{bf\sec^2(e+fx)^{3/4}}$$

$$= -\frac{d^2(d\sec(e+fx))^{3/2}}{2bf(a+b\tan(e+fx))^2} + \frac{\left(3d^2(d\sec(e+fx))^{3/2}\right)\text{Subst}\left(\int \frac{x}{(a+x)^2\sqrt[4]{1+\frac{x^2}{b^2}}}\,dx, x, b\right.}{4b^3f\sec^2(e+fx)^{3/4}}$$

$$= -\frac{d^2(d\sec(e+fx))^{3/2}}{2bf(a+b\tan(e+fx))^2} + \frac{3ad^2(d\sec(e+fx))^{3/2}}{4b\left(a^2+b^2\right)f(a+b\tan(e+fx))} - \frac{\left(3d^2(d\sec(e+f\right.}{}$$

$$= -\frac{d^2(d\sec(e+fx))^{3/2}}{2bf(a+b\tan(e+fx))^2} + \frac{3ad^2(d\sec(e+fx))^{3/2}}{4b\left(a^2+b^2\right)f(a+b\tan(e+fx))} - \frac{\left(3ad^2(d\sec(e+\right.}{8}$$

$$= -\frac{3ad^2\cos(e+fx)(d\sec(e+fx))^{3/2}\sin(e+fx)}{4b^2\left(a^2+b^2\right)f} - \frac{d^2(d\sec(e+fx))^{3/2}}{2bf(a+b\tan(e+fx))^2} + \frac{}{4b}$$

$$= \frac{3ad^2E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)(d\sec(e+fx))^{3/2}}{4b^2\left(a^2+b^2\right)f\sec^2(e+fx)^{3/4}} - \frac{3ad^2\cos(e+fx)(d\sec(e+}{4b^2\left(a^2+b^2\right.}$$

$$= \frac{3ad^2E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)(d\sec(e+fx))^{3/2}}{4b^2\left(a^2+b^2\right)f\sec^2(e+fx)^{3/4}} - \frac{3ad^2\cos(e+fx)(d\sec(e+}{4b^2\left(a^2+b^2\right.}$$

$$= \frac{3ad^2E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)(d\sec(e+fx))^{3/2}}{4b^2\left(a^2+b^2\right)f\sec^2(e+fx)^{3/4}} - \frac{3ad^2\cos(e+fx)(d\sec(e+}{4b^2\left(a^2+b^2\right.}$$

$$= \frac{3\left(a^2+2b^2\right)d^2\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)(d\sec(e+fx))^{3/2}}{8b^{5/2}\left(a^2+b^2\right)^{5/4}f\sec^2(e+fx)^{3/4}} - \frac{3\left(a^2+2b^2\right)d^2\tanh^{-1}}{8b^{5/2}\left(a^2+b\right.}$$

Mathematica [C] time = 29.50, size = 14225, normalized size = 24.40

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Sec[e + f*x])^(7/2)/(a + b*Tan[e + f*x])^3,x]
[Out] Result too large to show
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(7/2)/(a+b*tan(f*x+e))^3,x, algorithm="fricas")
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec \left(fx+e\right)\right)^{\frac{7}{2}}}{\left(b \tan \left(fx+e\right)+a\right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(7/2)/(a+b*tan(f*x+e))^3,x, algorithm="giac")
[Out] integrate((d*sec(f*x + e))^(7/2)/(b*tan(f*x + e) + a)^3, x)
```

maple [B] time = 7.56, size = 101372, normalized size = 173.88

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(7/2)/(a+b*tan(f*x+e))^3,x)
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(7/2)/(a+b*tan(f*x+e))^3,x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{7/2}}{{\left(a+b\,\tan\left(e+f\,x\right)\right)}^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(7/2)/(a + b*tan(e + f*x))^3,x)
[Out] int((d/cos(e + f*x))^(7/2)/(a + b*tan(e + f*x))^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(7/2)/(a+b*tan(f*x+e))**3,x)
[Out] Timed out
```

3.618 $\int \frac{(d\sec(e+fx))^{5/2}}{(a+b\tan(e+fx))^3}\,dx$

Optimal. Leaf size=532

$$\frac{ad^2\sqrt{d\sec(e+fx)}}{4bf\left(a^2+b^2\right)(a+b\tan(e+fx))}+\frac{ad^2\sqrt{d\sec(e+fx)}\,F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)}{4b^2f\left(a^2+b^2\right)\sqrt[4]{\sec^2(e+fx)}}-\frac{ad^2\left(a^2-2b^2\right)\sqrt{-\tan^2(e+}}{}$$

```
[Out] 1/8*(a^2-2*b^2)*d^2*arctan((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(d
*sec(f*x+e))^(1/2)/b^(3/2)/(a^2+b^2)^(7/4)/f/(sec(f*x+e)^2)^(1/4)+1/8*(a^2-
2*b^2)*d^2*arctanh((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(d*sec(f*x
+e))^(1/2)/b^(3/2)/(a^2+b^2)^(7/4)/f/(sec(f*x+e)^2)^(1/4)+1/4*a*d^2*(cos(1/
2*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arctan(tan(f*x+e)))*EllipticF(sin(1/
2*arctan(tan(f*x+e))),2^(1/2))*(d*sec(f*x+e))^(1/2)/b^2/(a^2+b^2)/f/(sec(f*
x+e)^2)^(1/4)-1/8*a*(a^2-2*b^2)*d^2*cot(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1
/4),-b/(a^2+b^2)^(1/2),I)*(d*sec(f*x+e))^(1/2)*(-tan(f*x+e)^2)^(1/2)/b^2/(a
^2+b^2)^2/f/(sec(f*x+e)^2)^(1/4)-1/8*a*(a^2-2*b^2)*d^2*cot(f*x+e)*EllipticP
i((sec(f*x+e)^2)^(1/4),b/(a^2+b^2)^(1/2),I)*(d*sec(f*x+e))^(1/2)*(-tan(f*x+
e)^2)^(1/2)/b^2/(a^2+b^2)^2/f/(sec(f*x+e)^2)^(1/4)-1/2*d^2*(d*sec(f*x+e))^(
1/2)/b/f/(a+b*tan(f*x+e))^2+1/4*a*d^2*(d*sec(f*x+e))^(1/2)/b/(a^2+b^2)/f/(a
+b*tan(f*x+e))
```

Rubi [A] time = 0.50, antiderivative size = 532, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 16, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.640, Rules used = {3512, 733, 835, 844, 231, 747, 401, 108, 409, 1213, 537, 444, 63, 212, 208, 205}

$$\frac{d^2\left(a^2-2b^2\right)\sqrt{d\sec(e+fx)}\,\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{8b^{3/2}f\left(a^2+b^2\right)^{7/4}\sqrt[4]{\sec^2(e+fx)}}+\frac{d^2\left(a^2-2b^2\right)\sqrt{d\sec(e+fx)}\,\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{8b^{3/2}f\left(a^2+b^2\right)^{7/4}\sqrt[4]{\sec^2(e+fx)}}+\frac{}{4b}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(5/2)/(a + b*Tan[e + f*x])^3,x]
```

```
[Out] ((a^2 - 2*b^2)*d^2*ArcTan[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4
)]*Sqrt[d*Sec[e + f*x]])/(8*b^(3/2)*(a^2 + b^2)^(7/4)*f*(Sec[e + f*x]^2)^(1
/4)) + ((a^2 - 2*b^2)*d^2*ArcTanh[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b
^2)^(1/4)]*Sqrt[d*Sec[e + f*x]])/(8*b^(3/2)*(a^2 + b^2)^(7/4)*f*(Sec[e + f*
x]^2)^(1/4)) + (a*d^2*EllipticF[ArcTan[Tan[e + f*x]]/2, 2]*Sqrt[d*Sec[e + f
*x]])/(4*b^2*(a^2 + b^2)*f*(Sec[e + f*x]^2)^(1/4)) - (a*(a^2 - 2*b^2)*d^2*C
ot[e + f*x]*EllipticPi[-(b/Sqrt[a^2 + b^2]), ArcSin[(Sec[e + f*x]^2)^(1/4)]
, -1]*Sqrt[d*Sec[e + f*x]]*Sqrt[-Tan[e + f*x]^2])/(8*b^2*(a^2 + b^2)^2*f*(S
ec[e + f*x]^2)^(1/4)) - (a*(a^2 - 2*b^2)*d^2*Cot[e + f*x]*EllipticPi[b/Sqrt
[a^2 + b^2], ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*Sqrt[d*Sec[e + f*x]]*Sqrt[
-Tan[e + f*x]^2])/(8*b^2*(a^2 + b^2)^2*f*(Sec[e + f*x]^2)^(1/4)) - (d^2*Sqr
t[d*Sec[e + f*x]])/(2*b*f*(a + b*Tan[e + f*x])^2) + (a*d^2*Sqrt[d*Sec[e + f
*x]])/(4*b*(a^2 + b^2)*f*(a + b*Tan[e + f*x]))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 108

```
Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(
3/4)), x_Symbol] :> Dist[-4, Subst[Int[1/((b*e - a*f - b*x^4)*Sqrt[c - (d*e
)/f + (d*x^4)/f]), x], x, (e + f*x)^(1/4)], x] /; FreeQ[{a, b, c, d, e, f},
 x] && GtQ[-(f/(d*e - c*f)), 0]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^4)^(-1), x_Symbol] :> With[{r = Numerator[Rt[-(a/b),
 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[r/(2*a), Int[1/(r - s*x^2), x],
 x] + Dist[r/(2*a), Int[1/(r + s*x^2), x], x]] /; FreeQ[{a, b}, x] &&  !GtQ
[a/b, 0]
```

Rule 231

```
Int[((a_) + (b_.)*(x_)^2)^(-3/4), x_Symbol] :> Simp[(2*EllipticF[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(3/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 401

```
Int[1/(((a_) + (b_.)*(x_)^2)^(3/4)*((c_) + (d_.)*(x_)^2)), x_Symbol] :> Dis
t[Sqrt[-((b*x^2)/a)]/(2*x), Subst[Int[1/(Sqrt[-((b*x)/a)]*(a + b*x)^(3/4)*(
c + d*x)), x], x, x^2], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 409

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^4]*((c_) + (d_.)*(x_)^4)), x_Symbol] :> Dist[
1/(2*c), Int[1/(Sqrt[a + b*x^4]*(1 - Rt[-(d/c), 2]*x^2)), x], x] + Dist[1/(
2*c), Int[1/(Sqrt[a + b*x^4]*(1 + Rt[-(d/c), 2]*x^2)), x], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] &&  !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] &&  !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 733

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
((d + e*x)^(m + 1)*(a + c*x^2)^p)/(e*(m + 1)), x] - Dist[(2*c*p)/(e*(m + 1)
), Int[x*(d + e*x)^(m + 1)*(a + c*x^2)^(p - 1), x], x] /; FreeQ[{a, c, d, e
, m}, x] && NeQ[c*d^2 + a*e^2, 0] && GtQ[p, 0] && (IntegerQ[p] || LtQ[m, -1
]) && NeQ[m, -1] &&  !ILtQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e,
m, p, x]
```

Rule 747

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(3/4)), x_Symbol] :> Dist[
d, Int[1/((d^2 - e^2*x^2)*(a + c*x^2)^(3/4)), x], x] - Dist[e, Int[x/((d^2
- e^2*x^2)*(a + c*x^2)^(3/4)), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^
2 + a*e^2, 0]
```

Rule 835

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[((e*f - d*g)*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/
((m + 1)*(c*d^2 + a*e^2)), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d +
e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 +
a*e^2, 0] && LtQ[m, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*
p])
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 1213

```
Int[1/(((d_) + (e_.)*(x_)^2)*Sqrt[(a_) + (c_.)*(x_)^4]), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[Sqrt[-c], Int[1/((d + e*x^2)*Sqrt[q + c*x^2]*Sqrt
[q - c*x^2]), x], x]] /; FreeQ[{a, c, d, e}, x] && GtQ[a, 0] && LtQ[c, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{(d\sec(e+fx))^{5/2}}{(a+b\tan(e+fx))^3}\,dx = \frac{\left(d^2\sqrt{d\sec(e+fx)}\right)\text{Subst}\left(\int \frac{\sqrt[4]{1+\frac{x^2}{b^2}}}{(a+x)^3}\,dx, x, b\tan(e+fx)\right)}{bf\sqrt[4]{\sec^2(e+fx)}}$$

$$= -\frac{d^2\sqrt{d\sec(e+fx)}}{2bf(a+b\tan(e+fx))^2} + \frac{\left(d^2\sqrt{d\sec(e+fx)}\right)\text{Subst}\left(\int \frac{x}{(a+x)^2\left(1+\frac{x^2}{b^2}\right)^{3/4}}\,dx, x, b\tan(\right.}{4b^3f\sqrt[4]{\sec^2(e+fx)}}$$

$$= -\frac{d^2\sqrt{d\sec(e+fx)}}{2bf(a+b\tan(e+fx))^2} + \frac{ad^2\sqrt{d\sec(e+fx)}}{4b\left(a^2+b^2\right)f(a+b\tan(e+fx))} - \frac{\left(d^2\sqrt{d\sec(e+fx)}\right.}{4b}$$

$$= -\frac{d^2\sqrt{d\sec(e+fx)}}{2bf(a+b\tan(e+fx))^2} + \frac{ad^2\sqrt{d\sec(e+fx)}}{4b\left(a^2+b^2\right)f(a+b\tan(e+fx))} + \frac{\left(ad^2\sqrt{d\sec(e+fx)}\right.}{8b^3}$$

$$= \frac{ad^2F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{4b^2\left(a^2+b^2\right)f\sqrt[4]{\sec^2(e+fx)}} - \frac{d^2\sqrt{d\sec(e+fx)}}{2bf(a+b\tan(e+fx))^2} + \frac{}{4b\left(a^2\right.}$$

$$= \frac{ad^2F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{4b^2\left(a^2+b^2\right)f\sqrt[4]{\sec^2(e+fx)}} - \frac{d^2\sqrt{d\sec(e+fx)}}{2bf(a+b\tan(e+fx))^2} + \frac{}{4b\left(a^2\right.}$$

$$= \frac{ad^2F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{4b^2\left(a^2+b^2\right)f\sqrt[4]{\sec^2(e+fx)}} - \frac{d^2\sqrt{d\sec(e+fx)}}{2bf(a+b\tan(e+fx))^2} + \frac{}{4b\left(a^2\right.}$$

$$= \frac{ad^2F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{4b^2\left(a^2+b^2\right)f\sqrt[4]{\sec^2(e+fx)}} - \frac{d^2\sqrt{d\sec(e+fx)}}{2bf(a+b\tan(e+fx))^2} + \frac{}{4b\left(a^2\right.}$$

$$= \frac{\left(a^2-2b^2\right)d^2\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt{d\sec(e+fx)}}{8b^{3/2}\left(a^2+b^2\right)^{7/4}f\sqrt[4]{\sec^2(e+fx)}} + \frac{\left(a^2-2b^2\right)d^2\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2}}{\sqrt[4]{a^2}}\right.}{8b^{3/2}\left(a^2+b^2\right)^{7/4}f\sqrt[4]{}}$$

$$= \frac{\left(a^2-2b^2\right)d^2\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt{d\sec(e+fx)}}{8b^{3/2}\left(a^2+b^2\right)^{7/4}f\sqrt[4]{\sec^2(e+fx)}} + \frac{\left(a^2-2b^2\right)d^2\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2}}{\sqrt[4]{a^2}}\right.}{8b^{3/2}\left(a^2+b^2\right)^{7/4}f\sqrt[4]{}}$$

Mathematica [C] time = 26.39, size = 4498, normalized size = 8.45

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Sec[e + f*x])^(5/2)/(a + b*Tan[e + f*x])^3,x]
```

```
[Out] (Sec[e + f*x]*(d*Sec[e + f*x])^(5/2)*(a*Cos[e + f*x] + b*Sin[e + f*x])^3*(-
1/4*1/((a - I*b)*(a + I*b)*b) - b/(2*(a - I*b)*(a + I*b)*(a*Cos[e + f*x] +
b*Sin[e + f*x])^2) + (3*Sin[e + f*x])/(4*(a - I*b)*(a + I*b)*(a*Cos[e + f*x
] + b*Sin[e + f*x]))))/(f*(a + b*Tan[e + f*x])^3) - (b^(9/2)*Sqrt[a^2 + b^2
]*(-8*a*b^(3/2)*(a^2 + b^2)^(3/2)*Sqrt[b^2*(a^2 + b^2)]*EllipticF[ArcSin[Ta
n[(e + f*x)/2]], -1] + (-a^2 + 2*b^2)*(Sqrt[b^2*(a^2 + b^2)]*(Sqrt[2*b^2*(b
 - Sqrt[a^2 + b^2]) - a^2*(-2*b + Sqrt[a^2 + b^2])]*(a^2 + b*(b + Sqrt[a^2
+ b^2]))*ArcTan[(a^2 - (a^2 + 2*b*(b - Sqrt[a^2 + b^2]))*Tan[(e + f*x)/2]^2
)/(2*Sqrt[b]*Sqrt[2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*(-2*b + Sqrt[a^2 + b^2]
)]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4])] + (-a^2 + b*(-b + Sqrt[a^2 + b^2
]))*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqrt[a^2 + b^2])]*ArcTan[
(a^2 - (a^2 + 2*b*(b + Sqrt[a^2 + b^2]))*Tan[(e + f*x)/2]^2)/(2*Sqrt[b]*Sqr
t[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqrt[a^2 + b^2])]*Sqrt[Cos[e + f
*x]*Sec[(e + f*x)/2]^4])]) - 4*a*b^(3/2)*(a^2 + b^2)^(3/2)*EllipticPi[a^2/(
a^2 + 2*b^2 - 2*Sqrt[b^2*(a^2 + b^2)]), ArcSin[Tan[(e + f*x)/2]], -1] + 4*a
*b^(3/2)*(a^2 + b^2)^(3/2)*EllipticPi[a^2/(a^2 + 2*(b^2 + Sqrt[b^2*(a^2 + b
^2)])), ArcSin[Tan[(e + f*x)/2]], -1]))*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^
4]*Sqrt[Sec[e + f*x]]*(d*Sec[e + f*x])^(5/2)*Sqrt[Cos[(e + f*x)/2]^2*Sec[e
+ f*x]]*(a*Cos[e + f*x] + b*Sin[e + f*x])^3*(1/(4*(a - I*b)*(a + I*b)*Sqrt[
Sec[e + f*x]]*(a*Cos[e + f*x] + b*Sin[e + f*x])) + (a*Sqrt[Sec[e + f*x]]*Si
n[e + f*x])/(8*(a - I*b)*(a + I*b)*b*(a*Cos[e + f*x] + b*Sin[e + f*x]))))/(
16*a^2*(b^2*(a^2 + b^2))^(7/2)*f*Sqrt[Sec[(e + f*x)/2]^2]*(a + b*Tan[e + f*
x])^3*((b^(9/2)*Sqrt[a^2 + b^2]*(-8*a*b^(3/2)*(a^2 + b^2)^(3/2)*Sqrt[b^2*(a
^2 + b^2)]*EllipticF[ArcSin[Tan[(e + f*x)/2]], -1] + (-a^2 + 2*b^2)*(Sqrt[b
^2*(a^2 + b^2)]*(Sqrt[2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*(-2*b + Sqrt[a^2 +
b^2])]*(a^2 + b*(b + Sqrt[a^2 + b^2]))*ArcTan[(a^2 - (a^2 + 2*b*(b - Sqrt[a
^2 + b^2]))*Tan[(e + f*x)/2]^2)/(2*Sqrt[b]*Sqrt[2*b^2*(b - Sqrt[a^2 + b^2])
 - a^2*(-2*b + Sqrt[a^2 + b^2])]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4])] +
(-a^2 + b*(-b + Sqrt[a^2 + b^2]))*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2
*b + Sqrt[a^2 + b^2])]*ArcTan[(a^2 - (a^2 + 2*b*(b + Sqrt[a^2 + b^2]))*Tan[
(e + f*x)/2]^2)/(2*Sqrt[b]*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sq
rt[a^2 + b^2])]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4])]) - 4*a*b^(3/2)*(a^2
 + b^2)^(3/2)*EllipticPi[a^2/(a^2 + 2*b^2 - 2*Sqrt[b^2*(a^2 + b^2)]), ArcSi
n[Tan[(e + f*x)/2]], -1] + 4*a*b^(3/2)*(a^2 + b^2)^(3/2)*EllipticPi[a^2/(a^
2 + 2*(b^2 + Sqrt[b^2*(a^2 + b^2)])), ArcSin[Tan[(e + f*x)/2]], -1]))*Sqrt[
Cos[e + f*x]*Sec[(e + f*x)/2]^4]*Sqrt[Cos[(e + f*x)/2]^2*Sec[e + f*x]]*Tan[
(e + f*x)/2])/(32*a^2*(b^2*(a^2 + b^2))^(7/2)*Sqrt[Sec[(e + f*x)/2]^2]) - (
b^(9/2)*Sqrt[a^2 + b^2]*(-8*a*b^(3/2)*(a^2 + b^2)^(3/2)*Sqrt[b^2*(a^2 + b^2
)]*EllipticF[ArcSin[Tan[(e + f*x)/2]], -1] + (-a^2 + 2*b^2)*(Sqrt[b^2*(a^2
+ b^2)]*(Sqrt[2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*(-2*b + Sqrt[a^2 + b^2])]*(
a^2 + b*(b + Sqrt[a^2 + b^2]))*ArcTan[(a^2 - (a^2 + 2*b*(b - Sqrt[a^2 + b^2
]))*Tan[(e + f*x)/2]^2)/(2*Sqrt[b]*Sqrt[2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*(
-2*b + Sqrt[a^2 + b^2])]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4])] + (-a^2 +
b*(-b + Sqrt[a^2 + b^2]))*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqr
t[a^2 + b^2])]*ArcTan[(a^2 - (a^2 + 2*b*(b + Sqrt[a^2 + b^2]))*Tan[(e + f*x
)/2]^2)/(2*Sqrt[b]*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqrt[a^2 +
 b^2])]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4])]) - 4*a*b^(3/2)*(a^2 + b^2)^
(3/2)*EllipticPi[a^2/(a^2 + 2*b^2 - 2*Sqrt[b^2*(a^2 + b^2)]), ArcSin[Tan[(e
 + f*x)/2]], -1] + 4*a*b^(3/2)*(a^2 + b^2)^(3/2)*EllipticPi[a^2/(a^2 + 2*(b
^2 + Sqrt[b^2*(a^2 + b^2)])), ArcSin[Tan[(e + f*x)/2]], -1]))*Sqrt[Cos[(e +
 f*x)/2]^2*Sec[e + f*x]]*(-(Sec[(e + f*x)/2]^4*Sin[e + f*x]) + 2*Cos[e + f*
x]*Sec[(e + f*x)/2]^4*Tan[(e + f*x)/2]))/(32*a^2*(b^2*(a^2 + b^2))^(7/2)*Sq
rt[Sec[(e + f*x)/2]^2]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4]) - (b^(9/2)*Sq
rt[a^2 + b^2]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4]*Sqrt[Cos[(e + f*x)/2]^2
*Sec[e + f*x]]*((-4*a*b^(3/2)*(a^2 + b^2)^(3/2)*Sqrt[b^2*(a^2 + b^2)]*Sec[(
e + f*x)/2]^2)/(Sqrt[1 - Tan[(e + f*x)/2]^2]*Sqrt[1 + Tan[(e + f*x)/2]^2])
+ (-a^2 + 2*b^2)*((-2*a*b^(3/2)*(a^2 + b^2)^(3/2)*Sec[(e + f*x)/2]^2)/(Sqrt
[1 - Tan[(e + f*x)/2]^2]*Sqrt[1 + Tan[(e + f*x)/2]^2]*(1 - (a^2*Tan[(e + f*
```

```
x)/2]^2)/(a^2 + 2*b^2 - 2*Sqrt[b^2*(a^2 + b^2)]))) + (2*a*b^(3/2)*(a^2 + b^
2)^(3/2)*Sec[(e + f*x)/2]^2)/(Sqrt[1 - Tan[(e + f*x)/2]^2]*Sqrt[1 + Tan[(e
+ f*x)/2]^2]*(1 - (a^2*Tan[(e + f*x)/2]^2)/(a^2 + 2*(b^2 + Sqrt[b^2*(a^2 +
b^2)])))) + Sqrt[b^2*(a^2 + b^2)]*((Sqrt[2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*
(-2*b + Sqrt[a^2 + b^2])]*(a^2 + b*(b + Sqrt[a^2 + b^2]))*(-1/2*((a^2 + 2*b
*(b - Sqrt[a^2 + b^2]))*Sec[(e + f*x)/2]^2*Tan[(e + f*x)/2])/(Sqrt[b]*Sqrt[
2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*(-2*b + Sqrt[a^2 + b^2])]*Sqrt[Cos[e + f*
x]*Sec[(e + f*x)/2]^4]) - ((-(Sec[(e + f*x)/2]^4*Sin[e + f*x]) + 2*Cos[e +
f*x]*Sec[(e + f*x)/2]^4*Tan[(e + f*x)/2])*(a^2 - (a^2 + 2*b*(b - Sqrt[a^2 +
 b^2]))*Tan[(e + f*x)/2]^2))/(4*Sqrt[b]*Sqrt[2*b^2*(b - Sqrt[a^2 + b^2]) -
a^2*(-2*b + Sqrt[a^2 + b^2])]*(Cos[e + f*x]*Sec[(e + f*x)/2]^4)^(3/2))))/(1
 + (Cos[(e + f*x)/2]^4*Sec[e + f*x]*(a^2 - (a^2 + 2*b*(b - Sqrt[a^2 + b^2])
)*Tan[(e + f*x)/2]^2)^2)/(4*b*(2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*(-2*b + Sq
rt[a^2 + b^2])))) + ((-a^2 + b*(-b + Sqrt[a^2 + b^2]))*Sqrt[2*b^2*(b + Sqrt
[a^2 + b^2]) + a^2*(2*b + Sqrt[a^2 + b^2])]*(-1/2*((a^2 + 2*b*(b + Sqrt[a^2
 + b^2]))*Sec[(e + f*x)/2]^2*Tan[(e + f*x)/2])/(Sqrt[b]*Sqrt[2*b^2*(b + Sqr
t[a^2 + b^2]) + a^2*(2*b + Sqrt[a^2 + b^2])]*Sqrt[Cos[e + f*x]*Sec[(e + f*x
)/2]^4]) - ((-(Sec[(e + f*x)/2]^4*Sin[e + f*x]) + 2*Cos[e + f*x]*Sec[(e + f
*x)/2]^4*Tan[(e + f*x)/2])*(a^2 - (a^2 + 2*b*(b + Sqrt[a^2 + b^2]))*Tan[(e
+ f*x)/2]^2))/(4*Sqrt[b]*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqrt
[a^2 + b^2])]*(Cos[e + f*x]*Sec[(e + f*x)/2]^4)^(3/2))))/(1 + (Cos[(e + f*x
)/2]^4*Sec[e + f*x]*(a^2 - (a^2 + 2*b*(b + Sqrt[a^2 + b^2]))*Tan[(e + f*x)/
2]^2)^2)/(4*b*(2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqrt[a^2 + b^2]))))
))))/(16*a^2*(b^2*(a^2 + b^2))^(7/2)*Sqrt[Sec[(e + f*x)/2]^2]) - (b^(9/2)*S
qrt[a^2 + b^2]*(-8*a*b^(3/2)*(a^2 + b^2)^(3/2)*Sqrt[b^2*(a^2 + b^2)]*Ellipt
icF[ArcSin[Tan[(e + f*x)/2]], -1] + (-a^2 + 2*b^2)*(Sqrt[b^2*(a^2 + b^2)]*(
Sqrt[2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*(-2*b + Sqrt[a^2 + b^2])]*(a^2 + b*(
b + Sqrt[a^2 + b^2]))*ArcTan[(a^2 - (a^2 + 2*b*(b - Sqrt[a^2 + b^2]))*Tan[(
e + f*x)/2]^2)/(2*Sqrt[b]*Sqrt[2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*(-2*b + Sq
rt[a^2 + b^2])]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4])] + (-a^2 + b*(-b + S
qrt[a^2 + b^2]))*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqrt[a^2 + b
^2])]*ArcTan[(a^2 - (a^2 + 2*b*(b + Sqrt[a^2 + b^2]))*Tan[(e + f*x)/2]^2)/(
2*Sqrt[b]*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqrt[a^2 + b^2])]*S
qrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4])]) - 4*a*b^(3/2)*(a^2 + b^2)^(3/2)*Ell
ipticPi[a^2/(a^2 + 2*b^2 - 2*Sqrt[b^2*(a^2 + b^2)]), ArcSin[Tan[(e + f*x)/2
]], -1] + 4*a*b^(3/2)*(a^2 + b^2)^(3/2)*EllipticPi[a^2/(a^2 + 2*(b^2 + Sqrt
[b^2*(a^2 + b^2)])), ArcSin[Tan[(e + f*x)/2]], -1]))*Sqrt[Cos[e + f*x]*Sec[
(e + f*x)/2]^4]*(-(Cos[(e + f*x)/2]*Sec[e + f*x]*Sin[(e + f*x)/2]) + Cos[(e
 + f*x)/2]^2*Sec[e + f*x]*Tan[e + f*x]))/(32*a^2*(b^2*(a^2 + b^2))^(7/2)*Sq
rt[Sec[(e + f*x)/2]^2]*Sqrt[Cos[(e + f*x)/2]^2*Sec[e + f*x]]))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e))^3,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(fx+e\right)\right)^{\frac{5}{2}}}{\left(b \tan\left(fx+e\right)+a\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e))^3,x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(5/2)/(b*tan(f*x + e) + a)^3, x)
```

maple [B] time = 3.94, size = 45973, normalized size = 86.42

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e))^3,x)
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e))^3,x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(\frac{d}{\cos(e+f\,x)}\right)^{5/2}}{\left(a+b\tan\left(e+f\,x\right)\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(5/2)/(a + b*tan(e + f*x))^3,x)
[Out] int((d/cos(e + f*x))^(5/2)/(a + b*tan(e + f*x))^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(e+fx\right)\right)^{\frac{5}{2}}}{\left(a+b\tan\left(e+fx\right)\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(5/2)/(a+b*tan(f*x+e))**3,x)
[Out] Integral((d*sec(e + f*x))**(5/2)/(a + b*tan(e + f*x))**3, x)
```

3.619 $\int \frac{(d\sec(e+fx))^{3/2}}{(a+b\tan(e+fx))^3}\,dx$

Optimal. Leaf size=566

$$\frac{(3a^2-2b^2)\,(d\sec(e+fx))^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{8\sqrt{b}\,f\,(a^2+b^2)^{9/4}\sec^2(e+fx)^{3/4}}-\frac{(3a^2-2b^2)\,(d\sec(e+fx))^{3/2}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{8\sqrt{b}\,f\,(a^2+b^2)^{9/4}\sec^2(e+fx)^{3/4}}-\frac{\cdots}{4f\,(\cdots}$$

```
[Out] -5/4*a*(cos(1/2*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arctan(tan(f*x+e)))*El
lipticE(sin(1/2*arctan(tan(f*x+e))),2^(1/2))*(d*sec(f*x+e))^(3/2)/(a^2+b^2)
^2/f/(sec(f*x+e)^2)^(3/4)+5/4*a*cos(f*x+e)*(d*sec(f*x+e))^(3/2)*sin(f*x+e)/
(a^2+b^2)^2/f+1/8*(3*a^2-2*b^2)*arctan((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^
2)^(1/4))*(d*sec(f*x+e))^(3/2)/(a^2+b^2)^(9/4)/f/(sec(f*x+e)^2)^(3/4)/b^(1/
2)-1/8*(3*a^2-2*b^2)*arctanh((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*
(d*sec(f*x+e))^(3/2)/(a^2+b^2)^(9/4)/f/(sec(f*x+e)^2)^(3/4)/b^(1/2)-1/8*a*(
3*a^2-2*b^2)*cot(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1/4),-b/(a^2+b^2)^(1/2),
I)*(d*sec(f*x+e))^(3/2)*(-tan(f*x+e)^2)^(1/2)/b/(a^2+b^2)^(5/2)/f/(sec(f*x+
e)^2)^(3/4)+1/8*a*(3*a^2-2*b^2)*cot(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1/4),
b/(a^2+b^2)^(1/2),I)*(d*sec(f*x+e))^(3/2)*(-tan(f*x+e)^2)^(1/2)/b/(a^2+b^2)
^(5/2)/f/(sec(f*x+e)^2)^(3/4)-1/2*b*(d*sec(f*x+e))^(3/2)/(a^2+b^2)/f/(a+b*t
an(f*x+e))^2-5/4*a*b*(d*sec(f*x+e))^(3/2)/(a^2+b^2)^2/f/(a+b*tan(f*x+e))
```

Rubi [A] time = 0.54, antiderivative size = 566, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 16, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.640, Rules used = {3512, 745, 835, 844, 227, 196, 746, 399, 490, 1213, 537, 444, 63, 298, 205, 208}

$$\frac{(3a^2-2b^2)\,(d\sec(e+fx))^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{8\sqrt{b}\,f\,(a^2+b^2)^{9/4}\sec^2(e+fx)^{3/4}}-\frac{(3a^2-2b^2)\,(d\sec(e+fx))^{3/2}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{8\sqrt{b}\,f\,(a^2+b^2)^{9/4}\sec^2(e+fx)^{3/4}}-\frac{\cdots}{4f\,(\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(3/2)/(a + b*Tan[e + f*x])^3,x]
```

```
[Out] ((3*a^2 - 2*b^2)*ArcTan[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2)^(1/4)]
*(d*Sec[e + f*x])^(3/2))/(8*Sqrt[b]*(a^2 + b^2)^(9/4)*f*(Sec[e + f*x]^2)^(3
/4)) - ((3*a^2 - 2*b^2)*ArcTanh[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b^2
)^(1/4)]*(d*Sec[e + f*x])^(3/2))/(8*Sqrt[b]*(a^2 + b^2)^(9/4)*f*(Sec[e + f*
x]^2)^(3/4)) - (5*a*EllipticE[ArcTan[Tan[e + f*x]]/2, 2]*(d*Sec[e + f*x])^(
3/2))/(4*(a^2 + b^2)^2*f*(Sec[e + f*x]^2)^(3/4)) + (5*a*Cos[e + f*x]*(d*Sec
[e + f*x])^(3/2)*Sin[e + f*x])/(4*(a^2 + b^2)^2*f) - (a*(3*a^2 - 2*b^2)*Cot
[e + f*x]*EllipticPi[-(b/Sqrt[a^2 + b^2]), ArcSin[(Sec[e + f*x]^2)^(1/4)],
-1]*(d*Sec[e + f*x])^(3/2)*Sqrt[-Tan[e + f*x]^2])/(8*b*(a^2 + b^2)^(5/2)*f*
(Sec[e + f*x]^2)^(3/4)) + (a*(3*a^2 - 2*b^2)*Cot[e + f*x]*EllipticPi[b/Sqrt
[a^2 + b^2], ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*(d*Sec[e + f*x])^(3/2)*Sqr
t[-Tan[e + f*x]^2])/(8*b*(a^2 + b^2)^(5/2)*f*(Sec[e + f*x]^2)^(3/4)) - (b*(
d*Sec[e + f*x])^(3/2))/(2*(a^2 + b^2)*f*(a + b*Tan[e + f*x])^2) - (5*a*b*(d
*Sec[e + f*x])^(3/2))/(4*(a^2 + b^2)^2*f*(a + b*Tan[e + f*x]))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 196

```
Int[((a_) + (b_.)*(x_)^2)^(-5/4), x_Symbol] :> Simp[(2*EllipticE[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(5/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 227

```
Int[((a_) + (b_.)*(x_)^2)^(-1/4), x_Symbol] :> Simp[(2*x)/(a + b*x^2)^(1/4)
, x] - Dist[a, Int[1/(a + b*x^2)^(5/4), x], x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 298

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[-(a/b
), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s/(2*b), Int[1/(r + s*x^2), x
], x] - Dist[s/(2*b), Int[1/(r - s*x^2), x], x]] /; FreeQ[{a, b}, x] &&  !G
tQ[a/b, 0]
```

Rule 399

```
Int[1/(((a_) + (b_.)*(x_)^2)^(1/4)*((c_) + (d_.)*(x_)^2)), x_Symbol] :> Dis
t[(2*Sqrt[-((b*x^2)/a)])/x, Subst[Int[x^2/(Sqrt[1 - x^4/a]*(b*c - a*d + d*x
^4)), x], x, (a + b*x^2)^(1/4)], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c -
a*d, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 490

```
Int[(x_)^2/(((a_) + (b_.)*(x_)^4)*Sqrt[(c_) + (d_.)*(x_)^4]), x_Symbol] :>
With[{r = Numerator[Rt[-(a/b), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s
/(2*b), Int[1/((r + s*x^2)*Sqrt[c + d*x^4]), x], x] - Dist[s/(2*b), Int[1/(
(r - s*x^2)*Sqrt[c + d*x^4]), x], x]] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c
- a*d, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] &&  !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] &&  !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 745

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/((m + 1)*(c*d^2 + a*e^2)), x] + D
ist[c/((m + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)*Simp[d*(m + 1) - e*(
m + 2*p + 3)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 NeQ[c*d^2 + a*e^2, 0] && NeQ[m, -1] && ((LtQ[m, -1] && IntQuadraticQ[a, 0,
 c, d, e, m, p, x]) || (SumSimplerQ[m, 1] && IntegerQ[p]) || ILtQ[Simplify[
m + 2*p + 3], 0])
```

Rule 746

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(1/4)), x_Symbol] :> Dist[
d, Int[1/((d^2 - e^2*x^2)*(a + c*x^2)^(1/4)), x], x] - Dist[e, Int[x/((d^2
- e^2*x^2)*(a + c*x^2)^(1/4)), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^
2 + a*e^2, 0]
```

Rule 835

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[((e*f - d*g)*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/
((m + 1)*(c*d^2 + a*e^2)), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d +
e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 +
a*e^2, 0] && LtQ[m, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*
p])
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 1213

```
Int[1/(((d_) + (e_.)*(x_)^2)*Sqrt[(a_) + (c_.)*(x_)^4]), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[Sqrt[-c], Int[1/((d + e*x^2)*Sqrt[q + c*x^2]*Sqrt
[q - c*x^2]), x], x]] /; FreeQ[{a, c, d, e}, x] && GtQ[a, 0] && LtQ[c, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{(d\sec(e+fx))^{3/2}}{(a+b\tan(e+fx))^3}\,dx = \frac{(d\sec(e+fx))^{3/2}\,\text{Subst}\left(\int \frac{1}{(a+x)^3\sqrt[4]{1+\frac{x^2}{b^2}}}\,dx, x, b\tan(e+fx)\right)}{bf\sec^2(e+fx)^{3/4}}$$

$$= -\frac{b(d\sec(e+fx))^{3/2}}{2(a^2+b^2)f(a+b\tan(e+fx))^2} - \frac{(d\sec(e+fx))^{3/2}\,\text{Subst}\left(\int \frac{-2a+\frac{x}{2}}{(a+x)^2\sqrt[4]{1+\frac{x^2}{b^2}}}\,dx,\right.}{2b(a^2+b^2)f\sec^2(e+fx)^{3/}}$$

$$= -\frac{b(d\sec(e+fx))^{3/2}}{2(a^2+b^2)f(a+b\tan(e+fx))^2} - \frac{5ab(d\sec(e+fx))^{3/2}}{4(a^2+b^2)^2 f(a+b\tan(e+fx))} + \frac{(b(d\sec}{}$$

$$= -\frac{b(d\sec(e+fx))^{3/2}}{2(a^2+b^2)f(a+b\tan(e+fx))^2} - \frac{5ab(d\sec(e+fx))^{3/2}}{4(a^2+b^2)^2 f(a+b\tan(e+fx))} + \frac{(5a(d\,\text{se}}{}$$

$$= \frac{5a\cos(e+fx)(d\sec(e+fx))^{3/2}\sin(e+fx)}{4(a^2+b^2)^2 f} - \frac{b(d\sec(e+fx))^{3/2}}{2(a^2+b^2)f(a+b\tan(e+fx))^2} -$$

$$= -\frac{5aE\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)(d\sec(e+fx))^{3/2}}{4(a^2+b^2)^2 f\sec^2(e+fx)^{3/4}} + \frac{5a\cos(e+fx)(d\sec(e+fx)}{4(a^2+b^2)^2 f}$$

$$= -\frac{5aE\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)(d\sec(e+fx))^{3/2}}{4(a^2+b^2)^2 f\sec^2(e+fx)^{3/4}} + \frac{5a\cos(e+fx)(d\sec(e+fx)}{4(a^2+b^2)^2 f}$$

$$= -\frac{5aE\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)(d\sec(e+fx))^{3/2}}{4(a^2+b^2)^2 f\sec^2(e+fx)^{3/4}} + \frac{5a\cos(e+fx)(d\sec(e+fx)}{4(a^2+b^2)^2 f}$$

$$= -\frac{\left(2-\frac{3a^2}{b^2}\right)b^{3/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)(d\sec(e+fx))^{3/2}}{8(a^2+b^2)^{9/4} f\sec^2(e+fx)^{3/4}} + \frac{\left(2-\frac{3a^2}{b^2}\right)b^{3/2}\tanh^{-1}\left(\right.}{8(a^2+b^2)}$$

Mathematica [C] time = 29.64, size = 14364, normalized size = 25.38

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Sec[e + f*x])^(3/2)/(a + b*Tan[e + f*x])^3,x]
[Out] Result too large to show
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e))^3,x, algorithm="fricas")
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(fx+e\right)\right)^{\frac{3}{2}}}{\left(b\tan\left(fx+e\right)+a\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e))^3,x, algorithm="giac")
[Out] integrate((d*sec(f*x + e))^(3/2)/(b*tan(f*x + e) + a)^3, x)
```

maple [B] time = 5.16, size = 80250, normalized size = 141.78

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e))^3,x)
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e))^3,x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{3/2}}{\left(a+b\tan\left(e+f\,x\right)\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(3/2)/(a + b*tan(e + f*x))^3,x)
[Out] int((d/cos(e + f*x))^(3/2)/(a + b*tan(e + f*x))^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(e+fx\right)\right)^{\frac{3}{2}}}{\left(a+b\tan\left(e+fx\right)\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(3/2)/(a+b*tan(f*x+e))**3,x)
[Out] Integral((d*sec(e + f*x))**(3/2)/(a + b*tan(e + f*x))**3, x)
```

3.620 $\int \frac{\sqrt{d\sec(e+fx)}}{(a+b\tan(e+fx))^3}\,dx$

Optimal. Leaf size=515

$$-\frac{3\sqrt{b}\left(5a^2-2b^2\right)\sqrt{d\sec(e+fx)}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{8f\left(a^2+b^2\right)^{11/4}\sqrt[4]{\sec^2(e+fx)}}-\frac{3\sqrt{b}\left(5a^2-2b^2\right)\sqrt{d\sec(e+fx)}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{8f\left(a^2+b^2\right)^{11/4}\sqrt[4]{\sec^2(e+fx)}}$$

```
[Out] -7/4*a*(cos(1/2*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arctan(tan(f*x+e)))*El
lipticF(sin(1/2*arctan(tan(f*x+e))),2^(1/2))*(d*sec(f*x+e))^(1/2)/(a^2+b^2)
^2/f/(sec(f*x+e)^2)^(1/4)-3/8*(5*a^2-2*b^2)*arctan((sec(f*x+e)^2)^(1/4)*b^(
1/2)/(a^2+b^2)^(1/4))*b^(1/2)*(d*sec(f*x+e))^(1/2)/(a^2+b^2)^(11/4)/f/(sec(
f*x+e)^2)^(1/4)-3/8*(5*a^2-2*b^2)*arctanh((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2
+b^2)^(1/4))*b^(1/2)*(d*sec(f*x+e))^(1/2)/(a^2+b^2)^(11/4)/f/(sec(f*x+e)^2)
^(1/4)+3/8*a*(5*a^2-2*b^2)*cot(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1/4),-b/(a
^2+b^2)^(1/2),I)*(d*sec(f*x+e))^(1/2)*(-tan(f*x+e)^2)^(1/2)/(a^2+b^2)^3/f/(
sec(f*x+e)^2)^(1/4)+3/8*a*(5*a^2-2*b^2)*cot(f*x+e)*EllipticPi((sec(f*x+e)^2
)^(1/4),b/(a^2+b^2)^(1/2),I)*(d*sec(f*x+e))^(1/2)*(-tan(f*x+e)^2)^(1/2)/(a^
2+b^2)^3/f/(sec(f*x+e)^2)^(1/4)-1/2*b*(d*sec(f*x+e))^(1/2)/(a^2+b^2)/f/(a+b
*tan(f*x+e))^2-7/4*a*b*(d*sec(f*x+e))^(1/2)/(a^2+b^2)^2/f/(a+b*tan(f*x+e))
```

Rubi [A] time = 0.52, antiderivative size = 515, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 16, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.640, Rules used = {3512, 745, 835, 844, 231, 747, 401, 108, 409, 1213, 537, 444, 63, 212, 208, 205}

$$-\frac{3\sqrt{b}\left(5a^2-2b^2\right)\sqrt{d\sec(e+fx)}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{8f\left(a^2+b^2\right)^{11/4}\sqrt[4]{\sec^2(e+fx)}}-\frac{3\sqrt{b}\left(5a^2-2b^2\right)\sqrt{d\sec(e+fx)}\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{8f\left(a^2+b^2\right)^{11/4}\sqrt[4]{\sec^2(e+fx)}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[d*Sec[e + f*x]]/(a + b*Tan[e + f*x])^3,x]
```

```
[Out] (-3*Sqrt[b]*(5*a^2 - 2*b^2)*ArcTan[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 +
b^2)^(1/4)]*Sqrt[d*Sec[e + f*x]])/(8*(a^2 + b^2)^(11/4)*f*(Sec[e + f*x]^2)^
(1/4)) - (3*Sqrt[b]*(5*a^2 - 2*b^2)*ArcTanh[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4)
)/(a^2 + b^2)^(1/4)]*Sqrt[d*Sec[e + f*x]])/(8*(a^2 + b^2)^(11/4)*f*(Sec[e +
 f*x]^2)^(1/4)) - (7*a*EllipticF[ArcTan[Tan[e + f*x]]/2, 2]*Sqrt[d*Sec[e +
f*x]])/(4*(a^2 + b^2)^2*f*(Sec[e + f*x]^2)^(1/4)) + (3*a*(5*a^2 - 2*b^2)*Co
t[e + f*x]*EllipticPi[-(b/Sqrt[a^2 + b^2]), ArcSin[(Sec[e + f*x]^2)^(1/4)],
 -1]*Sqrt[d*Sec[e + f*x]]*Sqrt[-Tan[e + f*x]^2])/(8*(a^2 + b^2)^3*f*(Sec[e
+ f*x]^2)^(1/4)) + (3*a*(5*a^2 - 2*b^2)*Cot[e + f*x]*EllipticPi[b/Sqrt[a^2
+ b^2], ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*Sqrt[d*Sec[e + f*x]]*Sqrt[-Tan[
e + f*x]^2])/(8*(a^2 + b^2)^3*f*(Sec[e + f*x]^2)^(1/4)) - (b*Sqrt[d*Sec[e +
 f*x]])/(2*(a^2 + b^2)*f*(a + b*Tan[e + f*x])^2) - (7*a*b*Sqrt[d*Sec[e + f*
x]])/(4*(a^2 + b^2)^2*f*(a + b*Tan[e + f*x]))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 108

```
Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(
3/4)), x_Symbol] :> Dist[-4, Subst[Int[1/((b*e - a*f - b*x^4)*Sqrt[c - (d*e
)/f + (d*x^4)/f]), x], x, (e + f*x)^(1/4)], x] /; FreeQ[{a, b, c, d, e, f},
 x] && GtQ[-(f/(d*e - c*f)), 0]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^4)^(-1), x_Symbol] :> With[{r = Numerator[Rt[-(a/b),
 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[r/(2*a), Int[1/(r - s*x^2), x],
 x] + Dist[r/(2*a), Int[1/(r + s*x^2), x], x]] /; FreeQ[{a, b}, x] &&  !GtQ
[a/b, 0]
```

Rule 231

```
Int[((a_) + (b_.)*(x_)^2)^(-3/4), x_Symbol] :> Simp[(2*EllipticF[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(3/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 401

```
Int[1/(((a_) + (b_.)*(x_)^2)^(3/4)*((c_) + (d_.)*(x_)^2)), x_Symbol] :> Dis
t[Sqrt[-((b*x^2)/a)]/(2*x), Subst[Int[1/(Sqrt[-((b*x)/a)]*(a + b*x)^(3/4)*(
c + d*x)), x], x, x^2], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 409

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^4]*((c_) + (d_.)*(x_)^4)), x_Symbol] :> Dist[
1/(2*c), Int[1/(Sqrt[a + b*x^4]*(1 - Rt[-(d/c), 2]*x^2)), x], x] + Dist[1/(
2*c), Int[1/(Sqrt[a + b*x^4]*(1 + Rt[-(d/c), 2]*x^2)), x], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] &&  !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] &&  !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 745

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/((m + 1)*(c*d^2 + a*e^2)), x] + D
ist[c/((m + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^(m + 1)*Simp[d*(m + 1) - e*(
m + 2*p + 3)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 NeQ[c*d^2 + a*e^2, 0] && NeQ[m, -1] && ((LtQ[m, -1] && IntQuadraticQ[a, 0,
 c, d, e, m, p, x]) || (SumSimplerQ[m, 1] && IntegerQ[p]) || ILtQ[Simplify[
m + 2*p + 3], 0])
```

Rule 747

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(3/4)), x_Symbol] :> Dist[
d, Int[1/((d^2 - e^2*x^2)*(a + c*x^2)^(3/4)), x], x] - Dist[e, Int[x/((d^2
- e^2*x^2)*(a + c*x^2)^(3/4)), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^
2 + a*e^2, 0]
```

Rule 835

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[((e*f - d*g)*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/
((m + 1)*(c*d^2 + a*e^2)), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d +
e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 +
a*e^2, 0] && LtQ[m, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*
p])
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 1213

```
Int[1/(((d_) + (e_.)*(x_)^2)*Sqrt[(a_) + (c_.)*(x_)^4]), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[Sqrt[-c], Int[1/((d + e*x^2)*Sqrt[q + c*x^2]*Sqrt
[q - c*x^2]), x], x]] /; FreeQ[{a, c, d, e}, x] && GtQ[a, 0] && LtQ[c, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\sqrt{d\sec(e+fx)}}{(a+b\tan(e+fx))^3}\,dx = \frac{\sqrt{d\sec(e+fx)}\,\text{Subst}\left(\int \frac{1}{(a+x)^3\left(1+\frac{x^2}{b^2}\right)^{3/4}}\,dx, x, b\tan(e+fx)\right)}{bf\sqrt[4]{\sec^2(e+fx)}}$$

$$= -\frac{b\sqrt{d\sec(e+fx)}}{2\left(a^2+b^2\right)f(a+b\tan(e+fx))^2} - \frac{\sqrt{d\sec(e+fx)}\,\text{Subst}\left(\int \frac{-2a+\frac{3x}{2}}{(a+x)^2\left(1+\frac{x^2}{b^2}\right)^{3/4}}\,dx, x, b \cdots\right)}{2b\left(a^2+b^2\right)f\sqrt[4]{\sec^2(e+fx)}}$$

$$= -\frac{b\sqrt{d\sec(e+fx)}}{2\left(a^2+b^2\right)f(a+b\tan(e+fx))^2} - \frac{7ab\sqrt{d\sec(e+fx)}}{4\left(a^2+b^2\right)^2 f(a+b\tan(e+fx))} + \frac{\left(b\sqrt{d\sec(e \cdots\right.}{\cdots}$$

$$= -\frac{b\sqrt{d\sec(e+fx)}}{2\left(a^2+b^2\right)f(a+b\tan(e+fx))^2} - \frac{7ab\sqrt{d\sec(e+fx)}}{4\left(a^2+b^2\right)^2 f(a+b\tan(e+fx))} - \frac{\left(7a\sqrt{d\sec \cdots\right.}{\cdots}$$

$$= -\frac{7aF\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{4\left(a^2+b^2\right)^2 f\sqrt[4]{\sec^2(e+fx)}} - \frac{b\sqrt{d\sec(e+fx)}}{2\left(a^2+b^2\right)f(a+b\tan(e+fx))^2}$$

$$= -\frac{7aF\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{4\left(a^2+b^2\right)^2 f\sqrt[4]{\sec^2(e+fx)}} - \frac{b\sqrt{d\sec(e+fx)}}{2\left(a^2+b^2\right)f(a+b\tan(e+fx))^2}$$

$$= -\frac{7aF\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{4\left(a^2+b^2\right)^2 f\sqrt[4]{\sec^2(e+fx)}} - \frac{b\sqrt{d\sec(e+fx)}}{2\left(a^2+b^2\right)f(a+b\tan(e+fx))^2}$$

$$= -\frac{7aF\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt{d\sec(e+fx)}}{4\left(a^2+b^2\right)^2 f\sqrt[4]{\sec^2(e+fx)}} - \frac{b\sqrt{d\sec(e+fx)}}{2\left(a^2+b^2\right)f(a+b\tan(e+fx))^2}$$

$$= \frac{3\left(2-\frac{5a^2}{b^2}\right)b^{5/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt{d\sec(e+fx)}}{8\left(a^2+b^2\right)^{11/4}f\sqrt[4]{\sec^2(e+fx)}} + \frac{3\left(2-\frac{5a^2}{b^2}\right)b^{5/2}\tanh^{-1}\left(\frac{\sqrt{b}\cdots}{\cdots}\right.}{8\left(a^2+b^2\right)^{11/4}f\cdots}$$

$$= \frac{3\left(2-\frac{5a^2}{b^2}\right)b^{5/2}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt{d\sec(e+fx)}}{8\left(a^2+b^2\right)^{11/4}f\sqrt[4]{\sec^2(e+fx)}} + \frac{3\left(2-\frac{5a^2}{b^2}\right)b^{5/2}\tanh^{-1}\left(\frac{\sqrt{b}\cdots}{\cdots}\right.}{8\left(a^2+b^2\right)^{11/4}f\cdots}$$

Mathematica [C] time = 26.25, size = 4455, normalized size = 8.65

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sqrt[d*Sec[e + f*x]]/(a + b*Tan[e + f*x])^3,x]
```

```
[Out] (Sec[e + f*x]^3*Sqrt[d*Sec[e + f*x]]*(a*Cos[e + f*x] + b*Sin[e + f*x])^3*((
-9*b)/(4*(a - I*b)^2*(a + I*b)^2) - b^3/(2*(a - I*b)^2*(a + I*b)^2*(a*Cos[e
 + f*x] + b*Sin[e + f*x])^2) + (11*b^2*Sin[e + f*x])/(4*(a - I*b)^2*(a + I*
b)^2*(a*Cos[e + f*x] + b*Sin[e + f*x]))))/(f*(a + b*Tan[e + f*x])^3) - ((8*
a*Sqrt[b^2*(a^2 + b^2)]*(-4*a^4 - a^2*b^2 + 3*b^4)*EllipticF[ArcSin[Tan[(e
+ f*x)/2]], -1] - 3*Sqrt[b]*(-5*a^2 + 2*b^2)*(Sqrt[b^2*(a^2 + b^2)]*((b + S
qrt[a^2 + b^2])*Sqrt[2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*(-2*b + Sqrt[a^2 + b
^2])]*ArcTan[(a^2 - (a^2 + 2*b*(b - Sqrt[a^2 + b^2]))*Tan[(e + f*x)/2]^2)/(
2*Sqrt[b]*Sqrt[2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*(-2*b + Sqrt[a^2 + b^2])]*
Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4])] + (b - Sqrt[a^2 + b^2])*Sqrt[2*b^2*
(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqrt[a^2 + b^2])]*ArcTan[(a^2 - (a^2 + 2
*b*(b + Sqrt[a^2 + b^2]))*Tan[(e + f*x)/2]^2)/(2*Sqrt[b]*Sqrt[2*b^2*(b + Sq
rt[a^2 + b^2]) + a^2*(2*b + Sqrt[a^2 + b^2])]*Sqrt[Cos[e + f*x]*Sec[(e + f*
x)/2]^4])]) - 4*a*b^(3/2)*(a^2 + b^2)*EllipticPi[a^2/(a^2 + 2*b^2 - 2*Sqrt[
b^2*(a^2 + b^2)]), ArcSin[Tan[(e + f*x)/2]], -1] + 4*a*b^(3/2)*(a^2 + b^2)*
EllipticPi[a^2/(a^2 + 2*(b^2 + Sqrt[b^2*(a^2 + b^2)])), ArcSin[Tan[(e + f*x
)/2]], -1]))*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4]*Sec[e + f*x]^(5/2)*Sqrt[
d*Sec[e + f*x]]*Sqrt[Cos[(e + f*x)/2]^2*Sec[e + f*x]]*(a*Cos[e + f*x] + b*S
in[e + f*x])^3*(a^2/((a - I*b)^2*(a + I*b)^2*Sqrt[Sec[e + f*x]]*(a*Cos[e +
f*x] + b*Sin[e + f*x])) - (3*b^2)/(4*(a - I*b)^2*(a + I*b)^2*Sqrt[Sec[e + f
*x]]*(a*Cos[e + f*x] + b*Sin[e + f*x])) - (7*a*b*Sqrt[Sec[e + f*x]]*Sin[e +
 f*x])/(8*(a - I*b)^2*(a + I*b)^2*(a*Cos[e + f*x] + b*Sin[e + f*x]))))/(16*
a^2*(a^2 + b^2)^3*Sqrt[b^2*(a^2 + b^2)]*f*Sqrt[Sec[(e + f*x)/2]^2]*(a + b*T
an[e + f*x])^3*(((8*a*Sqrt[b^2*(a^2 + b^2)]*(-4*a^4 - a^2*b^2 + 3*b^4)*Elli
pticF[ArcSin[Tan[(e + f*x)/2]], -1] - 3*Sqrt[b]*(-5*a^2 + 2*b^2)*(Sqrt[b^2*
(a^2 + b^2)]*((b + Sqrt[a^2 + b^2])*Sqrt[2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*
(-2*b + Sqrt[a^2 + b^2])]*ArcTan[(a^2 - (a^2 + 2*b*(b - Sqrt[a^2 + b^2]))*T
an[(e + f*x)/2]^2)/(2*Sqrt[b]*Sqrt[2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*(-2*b
+ Sqrt[a^2 + b^2])]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4])] + (b - Sqrt[a^2
 + b^2])*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqrt[a^2 + b^2])]*Ar
cTan[(a^2 - (a^2 + 2*b*(b + Sqrt[a^2 + b^2]))*Tan[(e + f*x)/2]^2)/(2*Sqrt[b
]*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqrt[a^2 + b^2])]*Sqrt[Cos[
e + f*x]*Sec[(e + f*x)/2]^4])]) - 4*a*b^(3/2)*(a^2 + b^2)*EllipticPi[a^2/(a
^2 + 2*b^2 - 2*Sqrt[b^2*(a^2 + b^2)]), ArcSin[Tan[(e + f*x)/2]], -1] + 4*a*
b^(3/2)*(a^2 + b^2)*EllipticPi[a^2/(a^2 + 2*(b^2 + Sqrt[b^2*(a^2 + b^2)])),
 ArcSin[Tan[(e + f*x)/2]], -1]))*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4]*Sqrt
[Cos[(e + f*x)/2]^2*Sec[e + f*x]]*Tan[(e + f*x)/2])/(32*a^2*(a^2 + b^2)^3*S
qrt[b^2*(a^2 + b^2)]*Sqrt[Sec[(e + f*x)/2]^2]) - ((8*a*Sqrt[b^2*(a^2 + b^2)
]*(-4*a^4 - a^2*b^2 + 3*b^4)*EllipticF[ArcSin[Tan[(e + f*x)/2]], -1] - 3*Sq
rt[b]*(-5*a^2 + 2*b^2)*(Sqrt[b^2*(a^2 + b^2)]*((b + Sqrt[a^2 + b^2])*Sqrt[2
*b^2*(b - Sqrt[a^2 + b^2]) - a^2*(-2*b + Sqrt[a^2 + b^2])]*ArcTan[(a^2 - (a
^2 + 2*b*(b - Sqrt[a^2 + b^2]))*Tan[(e + f*x)/2]^2)/(2*Sqrt[b]*Sqrt[2*b^2*(
b - Sqrt[a^2 + b^2]) - a^2*(-2*b + Sqrt[a^2 + b^2])]*Sqrt[Cos[e + f*x]*Sec[
(e + f*x)/2]^4])] + (b - Sqrt[a^2 + b^2])*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2])
+ a^2*(2*b + Sqrt[a^2 + b^2])]*ArcTan[(a^2 - (a^2 + 2*b*(b + Sqrt[a^2 + b^2
]))*Tan[(e + f*x)/2]^2)/(2*Sqrt[b]*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(
2*b + Sqrt[a^2 + b^2])]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4])]) - 4*a*b^(3
/2)*(a^2 + b^2)*EllipticPi[a^2/(a^2 + 2*b^2 - 2*Sqrt[b^2*(a^2 + b^2)]), Arc
Sin[Tan[(e + f*x)/2]], -1] + 4*a*b^(3/2)*(a^2 + b^2)*EllipticPi[a^2/(a^2 +
2*(b^2 + Sqrt[b^2*(a^2 + b^2)])), ArcSin[Tan[(e + f*x)/2]], -1]))*Sqrt[Cos[
(e + f*x)/2]^2*Sec[e + f*x]]*(-(Sec[(e + f*x)/2]^4*Sin[e + f*x]) + 2*Cos[e
+ f*x]*Sec[(e + f*x)/2]^4*Tan[(e + f*x)/2]))/(32*a^2*(a^2 + b^2)^3*Sqrt[b^2
*(a^2 + b^2)]*Sqrt[Sec[(e + f*x)/2]^2]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4
]) - (Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4]*Sqrt[Cos[(e + f*x)/2]^2*Sec[e +
 f*x]]*((4*a*Sqrt[b^2*(a^2 + b^2)]*(-4*a^4 - a^2*b^2 + 3*b^4)*Sec[(e + f*x)
/2]^2)/(Sqrt[1 - Tan[(e + f*x)/2]^2]*Sqrt[1 + Tan[(e + f*x)/2]^2]) - 3*Sqrt
[b]*(-5*a^2 + 2*b^2)*((-2*a*b^(3/2)*(a^2 + b^2)*Sec[(e + f*x)/2]^2)/(Sqrt[1
 - Tan[(e + f*x)/2]^2]*Sqrt[1 + Tan[(e + f*x)/2]^2]*(1 - (a^2*Tan[(e + f*x)
```

```
/2]^2)/(a^2 + 2*b^2 - 2*Sqrt[b^2*(a^2 + b^2)]))) + (2*a*b^(3/2)*(a^2 + b^2)
*Sec[(e + f*x)/2]^2)/(Sqrt[1 - Tan[(e + f*x)/2]^2]*Sqrt[1 + Tan[(e + f*x)/2
]^2]*(1 - (a^2*Tan[(e + f*x)/2]^2)/(a^2 + 2*(b^2 + Sqrt[b^2*(a^2 + b^2)])))
) + Sqrt[b^2*(a^2 + b^2)]*(((b + Sqrt[a^2 + b^2])*Sqrt[2*b^2*(b - Sqrt[a^2
+ b^2]) - a^2*(-2*b + Sqrt[a^2 + b^2])]*(-1/2*((a^2 + 2*b*(b - Sqrt[a^2 + b
^2]))*Sec[(e + f*x)/2]^2*Tan[(e + f*x)/2])/(Sqrt[b]*Sqrt[2*b^2*(b - Sqrt[a^
2 + b^2]) - a^2*(-2*b + Sqrt[a^2 + b^2])]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2
]^4]) - ((-(Sec[(e + f*x)/2]^4*Sin[e + f*x]) + 2*Cos[e + f*x]*Sec[(e + f*x)
/2]^4*Tan[(e + f*x)/2])*(a^2 - (a^2 + 2*b*(b - Sqrt[a^2 + b^2]))*Tan[(e + f
*x)/2]^2))/(4*Sqrt[b]*Sqrt[2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*(-2*b + Sqrt[a
^2 + b^2])]*(Cos[e + f*x]*Sec[(e + f*x)/2]^4)^(3/2))))/(1 + (Cos[(e + f*x)/
2]^4*Sec[e + f*x]*(a^2 - (a^2 + 2*b*(b - Sqrt[a^2 + b^2]))*Tan[(e + f*x)/2]
^2)^2)/(4*b*(2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*(-2*b + Sqrt[a^2 + b^2]))))
+ ((b - Sqrt[a^2 + b^2])*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqrt
[a^2 + b^2])]*(-1/2*((a^2 + 2*b*(b + Sqrt[a^2 + b^2]))*Sec[(e + f*x)/2]^2*T
an[(e + f*x)/2])/(Sqrt[b]*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqr
t[a^2 + b^2])]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4]) - ((-(Sec[(e + f*x)/2
]^4*Sin[e + f*x]) + 2*Cos[e + f*x]*Sec[(e + f*x)/2]^4*Tan[(e + f*x)/2])*(a^
2 - (a^2 + 2*b*(b + Sqrt[a^2 + b^2]))*Tan[(e + f*x)/2]^2))/(4*Sqrt[b]*Sqrt[
2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqrt[a^2 + b^2])]*(Cos[e + f*x]*Se
c[(e + f*x)/2]^4)^(3/2))))/(1 + (Cos[(e + f*x)/2]^4*Sec[e + f*x]*(a^2 - (a^
2 + 2*b*(b + Sqrt[a^2 + b^2]))*Tan[(e + f*x)/2]^2)^2)/(4*b*(2*b^2*(b + Sqrt
[a^2 + b^2]) + a^2*(2*b + Sqrt[a^2 + b^2]))))))))/(16*a^2*(a^2 + b^2)^3*Sqr
t[b^2*(a^2 + b^2)]*Sqrt[Sec[(e + f*x)/2]^2]) - ((8*a*Sqrt[b^2*(a^2 + b^2)]*
(-4*a^4 - a^2*b^2 + 3*b^4)*EllipticF[ArcSin[Tan[(e + f*x)/2]], -1] - 3*Sqrt
[b]*(-5*a^2 + 2*b^2)*(Sqrt[b^2*(a^2 + b^2)]*((b + Sqrt[a^2 + b^2])*Sqrt[2*b
^2*(b - Sqrt[a^2 + b^2]) - a^2*(-2*b + Sqrt[a^2 + b^2])]*ArcTan[(a^2 - (a^2
 + 2*b*(b - Sqrt[a^2 + b^2]))*Tan[(e + f*x)/2]^2)/(2*Sqrt[b]*Sqrt[2*b^2*(b
- Sqrt[a^2 + b^2]) - a^2*(-2*b + Sqrt[a^2 + b^2])]*Sqrt[Cos[e + f*x]*Sec[(e
 + f*x)/2]^4])] + (b - Sqrt[a^2 + b^2])*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]) +
a^2*(2*b + Sqrt[a^2 + b^2])]*ArcTan[(a^2 - (a^2 + 2*b*(b + Sqrt[a^2 + b^2])
)*Tan[(e + f*x)/2]^2)/(2*Sqrt[b]*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*
b + Sqrt[a^2 + b^2])]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4])]) - 4*a*b^(3/2
)*(a^2 + b^2)*EllipticPi[a^2/(a^2 + 2*b^2 - 2*Sqrt[b^2*(a^2 + b^2)]), ArcSi
n[Tan[(e + f*x)/2]], -1] + 4*a*b^(3/2)*(a^2 + b^2)*EllipticPi[a^2/(a^2 + 2*
(b^2 + Sqrt[b^2*(a^2 + b^2)])), ArcSin[Tan[(e + f*x)/2]], -1]))*Sqrt[Cos[e
+ f*x]*Sec[(e + f*x)/2]^4]*(-(Cos[(e + f*x)/2]*Sec[e + f*x]*Sin[(e + f*x)/2
]) + Cos[(e + f*x)/2]^2*Sec[e + f*x]*Tan[e + f*x]))/(32*a^2*(a^2 + b^2)^3*S
qrt[b^2*(a^2 + b^2)]*Sqrt[Sec[(e + f*x)/2]^2]*Sqrt[Cos[(e + f*x)/2]^2*Sec[e
 + f*x]])))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))^3,x, algorithm="fricas")
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d \sec\left(fx + e\right)}}{\left(b \tan\left(fx + e\right) + a\right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))^3,x, algorithm="giac")
```

```
[Out] integrate(sqrt(d*sec(f*x + e))/(b*tan(f*x + e) + a)^3, x)
```

maple [B] time = 5.53, size = 82035, normalized size = 159.29

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))^3,x)
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))^3,x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\sqrt{\frac{d}{\cos(e+f\,x)}}}{\left(a+b\tan\left(e+f\,x\right)\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(1/2)/(a + b*tan(e + f*x))^3,x)
[Out] int((d/cos(e + f*x))^(1/2)/(a + b*tan(e + f*x))^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d\sec\left(e+fx\right)}}{\left(a+b\tan\left(e+fx\right)\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(1/2)/(a+b*tan(f*x+e))**3,x)
[Out] Integral(sqrt(d*sec(e + f*x))/(a + b*tan(e + f*x))**3, x)
```

3.621 $\int \frac{1}{\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^3}\,dx$

Optimal. Leaf size=664

$$\frac{ab\left(8a^2-37b^2\right)\sec^2(e+fx)}{4f\left(a^2+b^2\right)^3\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))}+\frac{b\left(4a^2-5b^2\right)\sec^2(e+fx)}{2f\left(a^2+b^2\right)^2\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^2}-\frac{a\left(8a^2-3\right.}{4f\left(a^2+b^2\right.}$$

```
[Out] 5/8*b^(3/2)*(7*a^2-2*b^2)*arctan((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/
4))*(sec(f*x+e)^2)^(1/4)/(a^2+b^2)^(13/4)/f/(d*sec(f*x+e))^(1/2)-5/8*b^(3/2
)*(7*a^2-2*b^2)*arctanh((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(sec(
f*x+e)^2)^(1/4)/(a^2+b^2)^(13/4)/f/(d*sec(f*x+e))^(1/2)+1/4*a*(8*a^2-37*b^2
)*(cos(1/2*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arctan(tan(f*x+e)))*Ellipti
cE(sin(1/2*arctan(tan(f*x+e))),2^(1/2))*(sec(f*x+e)^2)^(1/4)/(a^2+b^2)^3/f/
(d*sec(f*x+e))^(1/2)-5/8*a*b*(7*a^2-2*b^2)*cot(f*x+e)*EllipticPi((sec(f*x+e
)^2)^(1/4),-b/(a^2+b^2)^(1/2),I)*(sec(f*x+e)^2)^(1/4)*(-tan(f*x+e)^2)^(1/2)
/(a^2+b^2)^(7/2)/f/(d*sec(f*x+e))^(1/2)+5/8*a*b*(7*a^2-2*b^2)*cot(f*x+e)*El
lipticPi((sec(f*x+e)^2)^(1/4),b/(a^2+b^2)^(1/2),I)*(sec(f*x+e)^2)^(1/4)*(-t
an(f*x+e)^2)^(1/2)/(a^2+b^2)^(7/2)/f/(d*sec(f*x+e))^(1/2)-1/4*a*(8*a^2-37*b
^2)*tan(f*x+e)/(a^2+b^2)^3/f/(d*sec(f*x+e))^(1/2)+1/2*b*(4*a^2-5*b^2)*sec(f
*x+e)^2/(a^2+b^2)^2/f/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))^2+2*(b+a*tan(f*
x+e))/(a^2+b^2)/f/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))^2+1/4*a*b*(8*a^2-37
*b^2)*sec(f*x+e)^2/(a^2+b^2)^3/f/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))
```

Rubi [A] time = 0.76, antiderivative size = 664, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 16, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.640$, Rules used = {3512, 741, 835, 844, 227, 196, 746, 399, 490, 1213, 537, 444, 63, 298, 205, 208}

$$\frac{5b^{3/2}\left(7a^2-2b^2\right)\sqrt[4]{\sec^2(e+fx)}\,\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{8f\left(a^2+b^2\right)^{13/4}\sqrt{d\sec(e+fx)}}+\frac{ab\left(8a^2-37b^2\right)\sec^2(e+fx)}{4f\left(a^2+b^2\right)^3\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))}+\frac{}{2f\left(a^2\right.}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x])^3),x]
```

```
[Out] (5*b^(3/2)*(7*a^2 - 2*b^2)*ArcTan[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 + b
^2)^(1/4)]*(Sec[e + f*x]^2)^(1/4))/(8*(a^2 + b^2)^(13/4)*f*Sqrt[d*Sec[e + f
*x]]) - (5*b^(3/2)*(7*a^2 - 2*b^2)*ArcTanh[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))
/(a^2 + b^2)^(1/4)]*(Sec[e + f*x]^2)^(1/4))/(8*(a^2 + b^2)^(13/4)*f*Sqrt[d*
Sec[e + f*x]]) + (a*(8*a^2 - 37*b^2)*EllipticE[ArcTan[Tan[e + f*x]]/2, 2]*(
Sec[e + f*x]^2)^(1/4))/(4*(a^2 + b^2)^3*f*Sqrt[d*Sec[e + f*x]]) - (a*(8*a^2
 - 37*b^2)*Tan[e + f*x])/(4*(a^2 + b^2)^3*f*Sqrt[d*Sec[e + f*x]]) - (5*a*b*
(7*a^2 - 2*b^2)*Cot[e + f*x]*EllipticPi[-(b/Sqrt[a^2 + b^2]), ArcSin[(Sec[e
 + f*x]^2)^(1/4)], -1]*(Sec[e + f*x]^2)^(1/4)*Sqrt[-Tan[e + f*x]^2])/(8*(a^
2 + b^2)^(7/2)*f*Sqrt[d*Sec[e + f*x]]) + (5*a*b*(7*a^2 - 2*b^2)*Cot[e + f*x
]*EllipticPi[b/Sqrt[a^2 + b^2], ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*(Sec[e
+ f*x]^2)^(1/4)*Sqrt[-Tan[e + f*x]^2])/(8*(a^2 + b^2)^(7/2)*f*Sqrt[d*Sec[e
+ f*x]]) + (b*(4*a^2 - 5*b^2)*Sec[e + f*x]^2)/(2*(a^2 + b^2)^2*f*Sqrt[d*Sec
[e + f*x]]*(a + b*Tan[e + f*x])^2) + (2*(b + a*Tan[e + f*x]))/((a^2 + b^2)*
f*Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x])^2) + (a*b*(8*a^2 - 37*b^2)*Sec[
e + f*x]^2)/(4*(a^2 + b^2)^3*f*Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x]))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
```

```
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 196

```
Int[((a_) + (b_.)*(x_)^2)^(-5/4), x_Symbol] :> Simp[(2*EllipticE[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(5/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 227

```
Int[((a_) + (b_.)*(x_)^2)^(-1/4), x_Symbol] :> Simp[(2*x)/(a + b*x^2)^(1/4)
, x] - Dist[a, Int[1/(a + b*x^2)^(5/4), x], x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 298

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[-(a/b
), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s/(2*b), Int[1/(r + s*x^2), x
], x] - Dist[s/(2*b), Int[1/(r - s*x^2), x], x]] /; FreeQ[{a, b}, x] &&  !G
tQ[a/b, 0]
```

Rule 399

```
Int[1/(((a_) + (b_.)*(x_)^2)^(1/4)*((c_) + (d_.)*(x_)^2)), x_Symbol] :> Dis
t[(2*Sqrt[-((b*x^2)/a)])/x, Subst[Int[x^2/(Sqrt[1 - x^4/a]*(b*c - a*d + d*x
^4)), x], x, (a + b*x^2)^(1/4)], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c -
a*d, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 490

```
Int[(x_)^2/(((a_) + (b_.)*(x_)^4)*Sqrt[(c_) + (d_.)*(x_)^4]), x_Symbol] :>
With[{r = Numerator[Rt[-(a/b), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s
/(2*b), Int[1/((r + s*x^2)*Sqrt[c + d*x^4]), x], x] - Dist[s/(2*b), Int[1/(
(r - s*x^2)*Sqrt[c + d*x^4]), x], x]] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c
- a*d, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
```

```
, e, f}, x] && !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] && !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 741

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(a*e + c*d*x)*(a + c*x^2)^(p + 1))/(2*a*(p + 1)*(c*d^2
+ a*e^2)), x] + Dist[1/(2*a*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*Simp[
c*d^2*(2*p + 3) + a*e^2*(m + 2*p + 3) + c*e*d*(m + 2*p + 4)*x, x]*(a + c*x^
2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] &&
 LtQ[p, -1] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 746

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(1/4)), x_Symbol] :> Dist[
d, Int[1/((d^2 - e^2*x^2)*(a + c*x^2)^(1/4)), x], x] - Dist[e, Int[x/((d^2
- e^2*x^2)*(a + c*x^2)^(1/4)), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^
2 + a*e^2, 0]
```

Rule 835

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[((e*f - d*g)*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/
((m + 1)*(c*d^2 + a*e^2)), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d +
e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 +
a*e^2, 0] && LtQ[m, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*
p])
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] && !IGtQ[m, 0]
```

Rule 1213

```
Int[1/(((d_) + (e_.)*(x_)^2)*Sqrt[(a_) + (c_.)*(x_)^4]), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[Sqrt[-c], Int[1/((d + e*x^2)*Sqrt[q + c*x^2]*Sqrt
[q - c*x^2]), x], x]] /; FreeQ[{a, c, d, e}, x] && GtQ[a, 0] && LtQ[c, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] && !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{1}{\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^3}\,dx = \frac{\sqrt[4]{\sec^2(e+fx)}\ \mathrm{Subst}\left(\int \frac{1}{(a+x)^3\left(1+\frac{x^2}{b^2}\right)^{5/4}}\,dx, x, b\tan(e+fx)\right)}{bf\sqrt{d\sec(e+fx)}}$$

$$= \frac{2(b+a\tan(e+fx))}{\left(a^2+b^2\right)f\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^2} - \frac{\left(2b\sqrt[4]{\sec^2(e+f\right.}{}$$

$$= \frac{b\left(4a^2-5b^2\right)\sec^2(e+fx)}{2\left(a^2+b^2\right)^2 f\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^2} + \frac{}{\left(a^2+b^2\right)f\sqrt{}}$$

$$= \frac{b\left(4a^2-5b^2\right)\sec^2(e+fx)}{2\left(a^2+b^2\right)^2 f\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^2} + \frac{}{\left(a^2+b^2\right)f\sqrt{}}$$

$$= \frac{b\left(4a^2-5b^2\right)\sec^2(e+fx)}{2\left(a^2+b^2\right)^2 f\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^2} + \frac{}{\left(a^2+b^2\right)f\sqrt{}}$$

$$= -\frac{a\left(8a^2-37b^2\right)\tan(e+fx)}{4\left(a^2+b^2\right)^3 f\sqrt{d\sec(e+fx)}} + \frac{b\left(4a^2-5b^2\right)\sec^2(e}{2\left(a^2+b^2\right)^2 f\sqrt{d\sec(e+fx)}\,(a}$$

$$= \frac{a\left(8a^2-37b^2\right)E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt[4]{\sec^2(e+fx)}}{4\left(a^2+b^2\right)^3 f\sqrt{d\sec(e+fx)}} - \frac{a(}{4(a^2}$$

$$= \frac{a\left(8a^2-37b^2\right)E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt[4]{\sec^2(e+fx)}}{4\left(a^2+b^2\right)^3 f\sqrt{d\sec(e+fx)}} - \frac{a(}{4(a^2}$$

$$= \frac{a\left(8a^2-37b^2\right)E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt[4]{\sec^2(e+fx)}}{4\left(a^2+b^2\right)^3 f\sqrt{d\sec(e+fx)}} - \frac{a(}{4(a^2}$$

$$= \frac{5b^{3/2}\left(7a^2-2b^2\right)\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt[4]{\sec^2(e+fx)}}{8\left(a^2+b^2\right)^{13/4} f\sqrt{d\sec(e+fx)}} - \frac{5b^{3/2}(7}{}$$

Mathematica [C] time = 30.07, size = 14652, normalized size = 22.07

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/(Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x])^3),x]
[Out] Result too large to show
```

fricas [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))^3,x, algorithm="fricas")
[Out] Timed out
```

giac [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{d\sec\left(fx+e\right)}\left(b\tan\left(fx+e\right)+a\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))^3,x, algorithm="giac")
[Out] integrate(1/(sqrt(d*sec(f*x + e))*(b*tan(f*x + e) + a)^3), x)
```

maple [**B**] time = 14.40, size = 100402, normalized size = 151.21

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))^3,x)
[Out] result too large to display
```

maxima [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))^3,x, algorithm="maxima")
[Out] Timed out
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{\sqrt{\frac{d}{\cos\left(e+f\,x\right)}}\,\left(a+b\tan\left(e+f\,x\right)\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d/cos(e + f*x))^(1/2)*(a + b*tan(e + f*x))^3),x)
[Out] int(1/((d/cos(e + f*x))^(1/2)*(a + b*tan(e + f*x))^3), x)
```

sympy [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{d\sec\left(e+fx\right)}\,\left(a+b\tan\left(e+fx\right)\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))**(1/2)/(a+b*tan(f*x+e))**3,x)
[Out] Integral(1/(sqrt(d*sec(e + f*x))*(a + b*tan(e + f*x))**3), x)
```

3.622 $\int \frac{1}{(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))^3}\,dx$

Optimal. Leaf size=620

$$\frac{ab\left(8a^2-69b^2\right)\sec^2(e+fx)}{12f\left(a^2+b^2\right)^3(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))}+\frac{b\left(4a^2-7b^2\right)\sec^2(e+fx)}{6f\left(a^2+b^2\right)^2(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))^2}+\frac{}{3f(}$$

```
[Out] -7/8*b^(5/2)*(9*a^2-2*b^2)*arctan((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1
/4))*(sec(f*x+e)^2)^(3/4)/(a^2+b^2)^(15/4)/f/(d*sec(f*x+e))^(3/2)-7/8*b^(5/
2)*(9*a^2-2*b^2)*arctanh((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))*(sec
(f*x+e)^2)^(3/4)/(a^2+b^2)^(15/4)/f/(d*sec(f*x+e))^(3/2)+1/12*a*(8*a^2-69*b
^2)*(cos(1/2*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arctan(tan(f*x+e)))*Ellip
ticF(sin(1/2*arctan(tan(f*x+e))),2^(1/2))*(sec(f*x+e)^2)^(3/4)/(a^2+b^2)^3/
f/(d*sec(f*x+e))^(3/2)+7/8*a*b^2*(9*a^2-2*b^2)*cot(f*x+e)*EllipticPi((sec(f
*x+e)^2)^(1/4),-b/(a^2+b^2)^(1/2),I)*(sec(f*x+e)^2)^(3/4)*(-tan(f*x+e)^2)^(
1/2)/(a^2+b^2)^4/f/(d*sec(f*x+e))^(3/2)+7/8*a*b^2*(9*a^2-2*b^2)*cot(f*x+e)*
EllipticPi((sec(f*x+e)^2)^(1/4),b/(a^2+b^2)^(1/2),I)*(sec(f*x+e)^2)^(3/4)*(
-tan(f*x+e)^2)^(1/2)/(a^2+b^2)^4/f/(d*sec(f*x+e))^(3/2)+1/6*b*(4*a^2-7*b^2)
*sec(f*x+e)^2/(a^2+b^2)^2/f/(d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e))^2+2/3*(b+
a*tan(f*x+e))/(a^2+b^2)/f/(d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e))^2+1/12*a*b*
(8*a^2-69*b^2)*sec(f*x+e)^2/(a^2+b^2)^3/f/(d*sec(f*x+e))^(3/2)/(a+b*tan(f*x
+e))
```

Rubi [A] time = 0.76, antiderivative size = 620, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 16, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.640, Rules used = {3512, 741, 835, 844, 231, 747, 401, 108, 409, 1213, 537, 444, 63, 212, 208, 205}

$$-\frac{7b^{5/2}\left(9a^2-2b^2\right)\sec^2(e+fx)^{3/4}\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)}{8f\left(a^2+b^2\right)^{15/4}(d\sec(e+fx))^{3/2}}+\frac{ab\left(8a^2-69b^2\right)\sec^2(e+fx)}{12f\left(a^2+b^2\right)^3(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))}-$$

Antiderivative was successfully verified.

```
[In] Int[1/((d*Sec[e + f*x])^(3/2)*(a + b*Tan[e + f*x])^3),x]
```

```
[Out] (-7*b^(5/2)*(9*a^2 - 2*b^2)*ArcTan[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 +
b^2)^(1/4)]*(Sec[e + f*x]^2)^(3/4))/(8*(a^2 + b^2)^(15/4)*f*(d*Sec[e + f*x]
)^(3/2)) - (7*b^(5/2)*(9*a^2 - 2*b^2)*ArcTanh[(Sqrt[b]*(Sec[e + f*x]^2)^(1/
4))/(a^2 + b^2)^(1/4)]*(Sec[e + f*x]^2)^(3/4))/(8*(a^2 + b^2)^(15/4)*f*(d*S
ec[e + f*x])^(3/2)) + (a*(8*a^2 - 69*b^2)*EllipticF[ArcTan[Tan[e + f*x]]/2,
 2]*(Sec[e + f*x]^2)^(3/4))/(12*(a^2 + b^2)^3*f*(d*Sec[e + f*x])^(3/2)) + (
7*a*b^2*(9*a^2 - 2*b^2)*Cot[e + f*x]*EllipticPi[-(b/Sqrt[a^2 + b^2]), ArcSi
n[(Sec[e + f*x]^2)^(1/4)], -1]*(Sec[e + f*x]^2)^(3/4)*Sqrt[-Tan[e + f*x]^2]
)/(8*(a^2 + b^2)^4*f*(d*Sec[e + f*x])^(3/2)) + (7*a*b^2*(9*a^2 - 2*b^2)*Cot
[e + f*x]*EllipticPi[b/Sqrt[a^2 + b^2], ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]
*(Sec[e + f*x]^2)^(3/4)*Sqrt[-Tan[e + f*x]^2])/(8*(a^2 + b^2)^4*f*(d*Sec[e
+ f*x])^(3/2)) + (b*(4*a^2 - 7*b^2)*Sec[e + f*x]^2)/(6*(a^2 + b^2)^2*f*(d*S
ec[e + f*x])^(3/2)*(a + b*Tan[e + f*x])^2) + (2*(b + a*Tan[e + f*x]))/(3*(a
^2 + b^2)*f*(d*Sec[e + f*x])^(3/2)*(a + b*Tan[e + f*x])^2) + (a*b*(8*a^2 -
69*b^2)*Sec[e + f*x]^2)/(12*(a^2 + b^2)^3*f*(d*Sec[e + f*x])^(3/2)*(a + b*T
an[e + f*x]))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
```

```
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 108

```
Int[1/(((a_.) + (b_.)*(x_))*Sqrt[(c_.) + (d_.)*(x_)]*((e_.) + (f_.)*(x_))^(
3/4)), x_Symbol] :> Dist[-4, Subst[Int[1/((b*e - a*f - b*x^4)*Sqrt[c - (d*e
)/f + (d*x^4)/f]), x], x, (e + f*x)^(1/4)], x] /; FreeQ[{a, b, c, d, e, f},
 x] && GtQ[-(f/(d*e - c*f)), 0]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 212

```
Int[((a_) + (b_.)*(x_)^4)^(-1), x_Symbol] :> With[{r = Numerator[Rt[-(a/b),
 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[r/(2*a), Int[1/(r - s*x^2), x],
 x] + Dist[r/(2*a), Int[1/(r + s*x^2), x], x]] /; FreeQ[{a, b}, x] &&  !GtQ
[a/b, 0]
```

Rule 231

```
Int[((a_) + (b_.)*(x_)^2)^(-3/4), x_Symbol] :> Simp[(2*EllipticF[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(3/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 401

```
Int[1/(((a_) + (b_.)*(x_)^2)^(3/4)*((c_) + (d_.)*(x_)^2)), x_Symbol] :> Dis
t[Sqrt[-((b*x^2)/a)]/(2*x), Subst[Int[1/(Sqrt[-((b*x)/a)]*(a + b*x)^(3/4)*(
c + d*x)), x], x, x^2], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 409

```
Int[1/(Sqrt[(a_) + (b_.)*(x_)^4]*((c_) + (d_.)*(x_)^4)), x_Symbol] :> Dist[
1/(2*c), Int[1/(Sqrt[a + b*x^4]*(1 - Rt[-(d/c), 2]*x^2)), x], x] + Dist[1/(
2*c), Int[1/(Sqrt[a + b*x^4]*(1 + Rt[-(d/c), 2]*x^2)), x], x] /; FreeQ[{a,
b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] &&  !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] &&  !( !GtQ[f/e, 0]
```

```
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 741

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(a*e + c*d*x)*(a + c*x^2)^(p + 1))/(2*a*(p + 1)*(c*d^2
+ a*e^2)), x] + Dist[1/(2*a*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*Simp[
c*d^2*(2*p + 3) + a*e^2*(m + 2*p + 3) + c*e*d*(m + 2*p + 4)*x, x]*(a + c*x^
2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] &&
 LtQ[p, -1] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 747

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(3/4)), x_Symbol] :> Dist[
d, Int[1/((d^2 - e^2*x^2)*(a + c*x^2)^(3/4)), x], x] - Dist[e, Int[x/((d^2
- e^2*x^2)*(a + c*x^2)^(3/4)), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^
2 + a*e^2, 0]
```

Rule 835

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[((e*f - d*g)*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/
((m + 1)*(c*d^2 + a*e^2)), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d +
e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 +
a*e^2, 0] && LtQ[m, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*
p])
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 1213

```
Int[1/(((d_) + (e_.)*(x_)^2)*Sqrt[(a_) + (c_.)*(x_)^4]), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[Sqrt[-c], Int[1/((d + e*x^2)*Sqrt[q + c*x^2]*Sqrt
[q - c*x^2]), x], x]] /; FreeQ[{a, c, d, e}, x] && GtQ[a, 0] && LtQ[c, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{1}{(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))^3}\,dx = \frac{\sec^2(e+fx)^{3/4}\,\text{Subst}\left(\int \frac{1}{(a+x)^3\left(1+\frac{x^2}{b^2}\right)^{7/4}}\,dx, x, b\tan(e+fx)\right)}{bf(d\sec(e+fx))^{3/2}}$$

$$= \frac{2(b+a\tan(e+fx))}{3\left(a^2+b^2\right)f(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))^2} - \frac{\left(2b\sec^2(e+\right.}{}$$

$$= \frac{b\left(4a^2-7b^2\right)\sec^2(e+fx)}{6\left(a^2+b^2\right)^2 f(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))^2} + \frac{}{3\left(a^2+b^2\right)f}$$

$$= \frac{b\left(4a^2-7b^2\right)\sec^2(e+fx)}{6\left(a^2+b^2\right)^2 f(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))^2} + \frac{}{3\left(a^2+b^2\right)f}$$

$$= \frac{b\left(4a^2-7b^2\right)\sec^2(e+fx)}{6\left(a^2+b^2\right)^2 f(d\sec(e+fx))^{3/2}(a+b\tan(e+fx))^2} + \frac{}{3\left(a^2+b^2\right)f}$$

$$= \frac{a\left(8a^2-69b^2\right)F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sec^2(e+fx)^{3/4}}{12\left(a^2+b^2\right)^3 f(d\sec(e+fx))^{3/2}} + \frac{}{6\left(a^2\right.}$$

$$= \frac{a\left(8a^2-69b^2\right)F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sec^2(e+fx)^{3/4}}{12\left(a^2+b^2\right)^3 f(d\sec(e+fx))^{3/2}} + \frac{}{6\left(a^2\right.}$$

$$= \frac{a\left(8a^2-69b^2\right)F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sec^2(e+fx)^{3/4}}{12\left(a^2+b^2\right)^3 f(d\sec(e+fx))^{3/2}} + \frac{}{6\left(a^2\right.}$$

$$= \frac{a\left(8a^2-69b^2\right)F\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sec^2(e+fx)^{3/4}}{12\left(a^2+b^2\right)^3 f(d\sec(e+fx))^{3/2}} + \frac{}{6\left(a^2\right.}$$

$$= -\frac{7b^{5/2}\left(9a^2-2b^2\right)\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sec^2(e+fx)^{3/4}}{8\left(a^2+b^2\right)^{15/4} f(d\sec(e+fx))^{3/2}} - \frac{7b^{5/2}\left(9\right.}{}$$

$$= -\frac{7b^{5/2}\left(9a^2-2b^2\right)\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sec^2(e+fx)^{3/4}}{8\left(a^2+b^2\right)^{15/4} f(d\sec(e+fx))^{3/2}} - \frac{7b^{5/2}\left(9\right.}{}$$

Mathematica [C] time = 25.83, size = 4709, normalized size = 7.60

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/((d*Sec[e + f*x])^(3/2)*(a + b*Tan[e + f*x])^3),x]
```

```
[Out] (Sec[e + f*x]^5*(a*Cos[e + f*x] + b*Sin[e + f*x])^3*((b*(12*a^2 - 55*b^2))/
(12*(a - I*b)^3*(a + I*b)^3) + (b*(3*a^2 - b^2)*Cos[2*(e + f*x)])/(3*(a - I
*b)^3*(a + I*b)^3) - b^5/(2*(a - I*b)^3*(a + I*b)^3*(a*Cos[e + f*x] + b*Sin
[e + f*x])^2) + (19*b^4*Sin[e + f*x])/(4*(a - I*b)^3*(a + I*b)^3*(a*Cos[e +
 f*x] + b*Sin[e + f*x])) + (a*(a^2 - 3*b^2)*Sin[2*(e + f*x)])/(3*(a - I*b)^
3*(a + I*b)^3)))/(f*(d*Sec[e + f*x])^(3/2)*(a + b*Tan[e + f*x])^3) - ((8*a*
Sqrt[b^2*(a^2 + b^2)]*(-4*a^6 - 64*a^4*b^2 - 39*a^2*b^4 + 21*b^6)*EllipticF
[ArcSin[Tan[(e + f*x)/2]], -1] - 21*b^(5/2)*(-9*a^2 + 2*b^2)*(Sqrt[b^2*(a^2
 + b^2)]*((b + Sqrt[a^2 + b^2])*Sqrt[2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*(-2*
b + Sqrt[a^2 + b^2])]*ArcTan[(a^2 - (a^2 + 2*b*(b - Sqrt[a^2 + b^2]))*Tan[(
e + f*x)/2]^2)/(2*Sqrt[b]*Sqrt[2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*(-2*b + Sq
rt[a^2 + b^2])]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4])] + (b - Sqrt[a^2 + b
^2])*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqrt[a^2 + b^2])]*ArcTan
[(a^2 - (a^2 + 2*b*(b + Sqrt[a^2 + b^2]))*Tan[(e + f*x)/2]^2)/(2*Sqrt[b]*Sq
rt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqrt[a^2 + b^2])]*Sqrt[Cos[e +
f*x]*Sec[(e + f*x)/2]^4])]) - 4*a*b^(3/2)*(a^2 + b^2)*EllipticPi[a^2/(a^2 +
 2*b^2 - 2*Sqrt[b^2*(a^2 + b^2)]), ArcSin[Tan[(e + f*x)/2]], -1] + 4*a*b^(3
/2)*(a^2 + b^2)*EllipticPi[a^2/(a^2 + 2*(b^2 + Sqrt[b^2*(a^2 + b^2)])), Arc
Sin[Tan[(e + f*x)/2]], -1]))*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4]*Sec[e +
f*x]^(9/2)*Sqrt[Cos[(e + f*x)/2]^2*Sec[e + f*x]]*(a*Cos[e + f*x] + b*Sin[e
+ f*x])^3*(a^4/(3*(a - I*b)^3*(a + I*b)^3*Sqrt[Sec[e + f*x]]*(a*Cos[e + f*x
] + b*Sin[e + f*x])) + (5*a^2*b^2)/((a - I*b)^3*(a + I*b)^3*Sqrt[Sec[e + f*
x]]*(a*Cos[e + f*x] + b*Sin[e + f*x])) - (7*b^4)/(4*(a - I*b)^3*(a + I*b)^3
*Sqrt[Sec[e + f*x]]*(a*Cos[e + f*x] + b*Sin[e + f*x])) + (a^3*b*Sqrt[Sec[e
+ f*x]]*Sin[e + f*x])/(3*(a - I*b)^3*(a + I*b)^3*(a*Cos[e + f*x] + b*Sin[e
+ f*x])) - (23*a*b^3*Sqrt[Sec[e + f*x]]*Sin[e + f*x])/(8*(a - I*b)^3*(a + I
*b)^3*(a*Cos[e + f*x] + b*Sin[e + f*x]))))/(48*a^2*(a^2 + b^2)^4*Sqrt[b^2*(
a^2 + b^2)]*f*Sqrt[Sec[(e + f*x)/2]^2]*(d*Sec[e + f*x])^(3/2)*(a + b*Tan[e
+ f*x])^3*(((8*a*Sqrt[b^2*(a^2 + b^2)]*(-4*a^6 - 64*a^4*b^2 - 39*a^2*b^4 +
21*b^6)*EllipticF[ArcSin[Tan[(e + f*x)/2]], -1] - 21*b^(5/2)*(-9*a^2 + 2*b^
2)*(Sqrt[b^2*(a^2 + b^2)]*((b + Sqrt[a^2 + b^2])*Sqrt[2*b^2*(b - Sqrt[a^2 +
 b^2]) - a^2*(-2*b + Sqrt[a^2 + b^2])]*ArcTan[(a^2 - (a^2 + 2*b*(b - Sqrt[a
^2 + b^2]))*Tan[(e + f*x)/2]^2)/(2*Sqrt[b]*Sqrt[2*b^2*(b - Sqrt[a^2 + b^2])
 - a^2*(-2*b + Sqrt[a^2 + b^2])]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4])] +
(b - Sqrt[a^2 + b^2])*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqrt[a^
2 + b^2])]*ArcTan[(a^2 - (a^2 + 2*b*(b + Sqrt[a^2 + b^2]))*Tan[(e + f*x)/2]
^2)/(2*Sqrt[b]*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqrt[a^2 + b^2
])]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4])]) - 4*a*b^(3/2)*(a^2 + b^2)*Elli
pticPi[a^2/(a^2 + 2*b^2 - 2*Sqrt[b^2*(a^2 + b^2)]), ArcSin[Tan[(e + f*x)/2]
], -1] + 4*a*b^(3/2)*(a^2 + b^2)*EllipticPi[a^2/(a^2 + 2*(b^2 + Sqrt[b^2*(a
^2 + b^2)])), ArcSin[Tan[(e + f*x)/2]], -1]))*Sqrt[Cos[e + f*x]*Sec[(e + f*
x)/2]^4]*Sqrt[Cos[(e + f*x)/2]^2*Sec[e + f*x]]*Tan[(e + f*x)/2])/(96*a^2*(a
^2 + b^2)^4*Sqrt[b^2*(a^2 + b^2)]*Sqrt[Sec[(e + f*x)/2]^2]) - ((8*a*Sqrt[b^
2*(a^2 + b^2)]*(-4*a^6 - 64*a^4*b^2 - 39*a^2*b^4 + 21*b^6)*EllipticF[ArcSin
[Tan[(e + f*x)/2]], -1] - 21*b^(5/2)*(-9*a^2 + 2*b^2)*(Sqrt[b^2*(a^2 + b^2)
]*((b + Sqrt[a^2 + b^2])*Sqrt[2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*(-2*b + Sqr
t[a^2 + b^2])]*ArcTan[(a^2 - (a^2 + 2*b*(b - Sqrt[a^2 + b^2]))*Tan[(e + f*x
)/2]^2)/(2*Sqrt[b]*Sqrt[2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*(-2*b + Sqrt[a^2
+ b^2])]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4])] + (b - Sqrt[a^2 + b^2])*Sq
rt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqrt[a^2 + b^2])]*ArcTan[(a^2 -
 (a^2 + 2*b*(b + Sqrt[a^2 + b^2]))*Tan[(e + f*x)/2]^2)/(2*Sqrt[b]*Sqrt[2*b^
2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqrt[a^2 + b^2])]*Sqrt[Cos[e + f*x]*Se
```

```
c[(e + f*x)/2]^4])]) - 4*a*b^(3/2)*(a^2 + b^2)*EllipticPi[a^2/(a^2 + 2*b^2
 - 2*Sqrt[b^2*(a^2 + b^2)]), ArcSin[Tan[(e + f*x)/2]], -1] + 4*a*b^(3/2)*(a^
2 + b^2)*EllipticPi[a^2/(a^2 + 2*(b^2 + Sqrt[b^2*(a^2 + b^2)])), ArcSin[Tan
[(e + f*x)/2]], -1]))*Sqrt[Cos[(e + f*x)/2]^2*Sec[e + f*x]]*(-(Sec[(e + f*x
)/2]^4*Sin[e + f*x]) + 2*Cos[e + f*x]*Sec[(e + f*x)/2]^4*Tan[(e + f*x)/2]))
/(96*a^2*(a^2 + b^2)^4*Sqrt[b^2*(a^2 + b^2)]*Sqrt[Sec[(e + f*x)/2]^2]*Sqrt[
Cos[e + f*x]*Sec[(e + f*x)/2]^4]) - (Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4]*
Sqrt[Cos[(e + f*x)/2]^2*Sec[e + f*x]]*((4*a*Sqrt[b^2*(a^2 + b^2)]*(-4*a^6 -
 64*a^4*b^2 - 39*a^2*b^4 + 21*b^6)*Sec[(e + f*x)/2]^2)/(Sqrt[1 - Tan[(e + f
*x)/2]^2]*Sqrt[1 + Tan[(e + f*x)/2]^2]) - 21*b^(5/2)*(-9*a^2 + 2*b^2)*((-2*
a*b^(3/2)*(a^2 + b^2)*Sec[(e + f*x)/2]^2)/(Sqrt[1 - Tan[(e + f*x)/2]^2]*Sqr
t[1 + Tan[(e + f*x)/2]^2]*(1 - (a^2*Tan[(e + f*x)/2]^2)/(a^2 + 2*b^2 - 2*Sq
rt[b^2*(a^2 + b^2)]))) + (2*a*b^(3/2)*(a^2 + b^2)*Sec[(e + f*x)/2]^2)/(Sqrt
[1 - Tan[(e + f*x)/2]^2]*Sqrt[1 + Tan[(e + f*x)/2]^2]*(1 - (a^2*Tan[(e + f*
x)/2]^2)/(a^2 + 2*(b^2 + Sqrt[b^2*(a^2 + b^2)]))))) + Sqrt[b^2*(a^2 + b^2)]*
(((b + Sqrt[a^2 + b^2])*Sqrt[2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*(-2*b + Sqrt
[a^2 + b^2])]*(-1/2*((a^2 + 2*b*(b - Sqrt[a^2 + b^2]))*Sec[(e + f*x)/2]^2*T
an[(e + f*x)/2])/(Sqrt[b]*Sqrt[2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*(-2*b + Sq
rt[a^2 + b^2])]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4]) - ((-(Sec[(e + f*x)/
2]^4*Sin[e + f*x]) + 2*Cos[e + f*x]*Sec[(e + f*x)/2]^4*Tan[(e + f*x)/2])*(a
^2 - (a^2 + 2*b*(b - Sqrt[a^2 + b^2]))*Tan[(e + f*x)/2]^2))/(4*Sqrt[b]*Sqrt
[2*b^2*(b - Sqrt[a^2 + b^2]) - a^2*(-2*b + Sqrt[a^2 + b^2])]*(Cos[e + f*x]*
Sec[(e + f*x)/2]^4)^(3/2))))/(1 + (Cos[(e + f*x)/2]^4*Sec[e + f*x]*(a^2 - (
a^2 + 2*b*(b - Sqrt[a^2 + b^2]))*Tan[(e + f*x)/2]^2)^2)/(4*b*(2*b^2*(b - Sq
rt[a^2 + b^2]) - a^2*(-2*b + Sqrt[a^2 + b^2])))) + ((b - Sqrt[a^2 + b^2])*S
qrt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqrt[a^2 + b^2])]*(-1/2*((a^2
+ 2*b*(b + Sqrt[a^2 + b^2]))*Sec[(e + f*x)/2]^2*Tan[(e + f*x)/2])/(Sqrt[b]*
Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqrt[a^2 + b^2])]*Sqrt[Cos[e
+ f*x]*Sec[(e + f*x)/2]^4]) - ((-(Sec[(e + f*x)/2]^4*Sin[e + f*x]) + 2*Cos[
e + f*x]*Sec[(e + f*x)/2]^4*Tan[(e + f*x)/2])*(a^2 - (a^2 + 2*b*(b + Sqrt[a
^2 + b^2]))*Tan[(e + f*x)/2]^2))/(4*Sqrt[b]*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]
) + a^2*(2*b + Sqrt[a^2 + b^2])]*(Cos[e + f*x]*Sec[(e + f*x)/2]^4)^(3/2))))
/(1 + (Cos[(e + f*x)/2]^4*Sec[e + f*x]*(a^2 - (a^2 + 2*b*(b + Sqrt[a^2 + b^
2]))*Tan[(e + f*x)/2]^2)^2)/(4*b*(2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b +
Sqrt[a^2 + b^2])))))))/(48*a^2*(a^2 + b^2)^4*Sqrt[b^2*(a^2 + b^2)]*Sqrt[Se
c[(e + f*x)/2]^2]) - ((8*a*Sqrt[b^2*(a^2 + b^2)]*(-4*a^6 - 64*a^4*b^2 - 39*
a^2*b^4 + 21*b^6)*EllipticF[ArcSin[Tan[(e + f*x)/2]], -1] - 21*b^(5/2)*(-9*
a^2 + 2*b^2)*(Sqrt[b^2*(a^2 + b^2)]*((b + Sqrt[a^2 + b^2])*Sqrt[2*b^2*(b -
Sqrt[a^2 + b^2]) - a^2*(-2*b + Sqrt[a^2 + b^2])]*ArcTan[(a^2 - (a^2 + 2*b*(
b - Sqrt[a^2 + b^2]))*Tan[(e + f*x)/2]^2)/(2*Sqrt[b]*Sqrt[2*b^2*(b - Sqrt[a
^2 + b^2]) - a^2*(-2*b + Sqrt[a^2 + b^2])]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/
2]^4])] + (b - Sqrt[a^2 + b^2])*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b
 + Sqrt[a^2 + b^2])]*ArcTan[(a^2 - (a^2 + 2*b*(b + Sqrt[a^2 + b^2]))*Tan[(e
 + f*x)/2]^2)/(2*Sqrt[b]*Sqrt[2*b^2*(b + Sqrt[a^2 + b^2]) + a^2*(2*b + Sqrt
[a^2 + b^2])]*Sqrt[Cos[e + f*x]*Sec[(e + f*x)/2]^4])]) - 4*a*b^(3/2)*(a^2 +
 b^2)*EllipticPi[a^2/(a^2 + 2*b^2 - 2*Sqrt[b^2*(a^2 + b^2)]), ArcSin[Tan[(e
 + f*x)/2]], -1] + 4*a*b^(3/2)*(a^2 + b^2)*EllipticPi[a^2/(a^2 + 2*(b^2 + S
qrt[b^2*(a^2 + b^2)])), ArcSin[Tan[(e + f*x)/2]], -1]))*Sqrt[Cos[e + f*x]*S
ec[(e + f*x)/2]^4]*(-(Cos[(e + f*x)/2]*Sec[e + f*x]*Sin[(e + f*x)/2]) + Cos
[(e + f*x)/2]^2*Sec[e + f*x]*Tan[e + f*x]))/(96*a^2*(a^2 + b^2)^4*Sqrt[b^2*
(a^2 + b^2)]*Sqrt[Sec[(e + f*x)/2]^2]*Sqrt[Cos[(e + f*x)/2]^2*Sec[e + f*x]]
)))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e))^3,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(fx+e\right)\right)^{\frac{3}{2}}\left(b\tan\left(fx+e\right)+a\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e))^3,x, algorithm="giac")
[Out] integrate(1/((d*sec(f*x + e))^(3/2)*(b*tan(f*x + e) + a)^3), x)
```

maple [B] time = 5.67, size = 82289, normalized size = 132.72

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e))^3,x)
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(3/2)/(a+b*tan(f*x+e))^3,x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{3/2}\,{\left(a+b\,\tan\left(e+f\,x\right)\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d/cos(e + f*x))^(3/2)*(a + b*tan(e + f*x))^3),x)
[Out] int(1/((d/cos(e + f*x))^(3/2)*(a + b*tan(e + f*x))^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(e+fx\right)\right)^{\frac{3}{2}}\left(a+b\tan\left(e+fx\right)\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))**(3/2)/(a+b*tan(f*x+e))**3,x)
[Out] Integral(1/((d*sec(e + f*x))**(3/2)*(a + b*tan(e + f*x))**3), x)
```

3.623 $\int \frac{1}{(d\sec(e+fx))^{5/2}(a+b\tan(e+fx))^3}\,dx$

Optimal. Leaf size=814

$$\frac{9\left(11a^2-2b^2\right)\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt[4]{\sec^2(e+fx)}\,b^{7/2}}{8\left(a^2+b^2\right)^{17/4}d^2f\sqrt{d\sec(e+fx)}}-\frac{9\left(11a^2-2b^2\right)\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt[4]{\sec^2(e+fx)}\,b^{7/}}{8\left(a^2+b^2\right)^{17/4}d^2f\sqrt{d\sec(e+fx)}}$$

```
[Out] 9/8*b^(7/2)*(11*a^2-2*b^2)*arctan((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1
/4))*(sec(f*x+e)^2)^(1/4)/(a^2+b^2)^(17/4)/d^2/f/(d*sec(f*x+e))^(1/2)-9/8*b
^(7/2)*(11*a^2-2*b^2)*arctanh((sec(f*x+e)^2)^(1/4)*b^(1/2)/(a^2+b^2)^(1/4))
*(sec(f*x+e)^2)^(1/4)/(a^2+b^2)^(17/4)/d^2/f/(d*sec(f*x+e))^(1/2)+3/20*a*(8
*a^4+64*a^2*b^2-139*b^4)*(cos(1/2*arctan(tan(f*x+e)))^2)^(1/2)/cos(1/2*arct
an(tan(f*x+e)))*EllipticE(sin(1/2*arctan(tan(f*x+e))),2^(1/2))*(sec(f*x+e)^
2)^(1/4)/(a^2+b^2)^4/d^2/f/(d*sec(f*x+e))^(1/2)-9/8*a*b^3*(11*a^2-2*b^2)*co
t(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1/4),-b/(a^2+b^2)^(1/2),I)*(sec(f*x+e)^
2)^(1/4)*(-tan(f*x+e)^2)^(1/2)/(a^2+b^2)^(9/2)/d^2/f/(d*sec(f*x+e))^(1/2)+9
/8*a*b^3*(11*a^2-2*b^2)*cot(f*x+e)*EllipticPi((sec(f*x+e)^2)^(1/4),b/(a^2+b
^2)^(1/2),I)*(sec(f*x+e)^2)^(1/4)*(-tan(f*x+e)^2)^(1/2)/(a^2+b^2)^(9/2)/d^2
/f/(d*sec(f*x+e))^(1/2)-3/20*a*(8*a^4+64*a^2*b^2-139*b^4)*tan(f*x+e)/(a^2+b
^2)^4/d^2/f/(d*sec(f*x+e))^(1/2)+3/10*b*(4*a^4+28*a^2*b^2-15*b^4)*sec(f*x+e
)^2/(a^2+b^2)^3/d^2/f/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))^2+2/5*cos(f*x+e
)^2*(b+a*tan(f*x+e))/(a^2+b^2)/d^2/f/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))^
2+3/20*a*b*(8*a^4+64*a^2*b^2-139*b^4)*sec(f*x+e)^2/(a^2+b^2)^4/d^2/f/(d*sec
(f*x+e))^(1/2)/(a+b*tan(f*x+e))-2/5*(b*(4*a^2-9*b^2)-a*(3*a^2+16*b^2)*tan(f
*x+e))/(a^2+b^2)^2/d^2/f/(d*sec(f*x+e))^(1/2)/(a+b*tan(f*x+e))^2
```

Rubi [A] time = 0.92, antiderivative size = 814, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 17, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.680, Rules used = {3512, 741, 823, 835, 844, 227, 196, 746, 399, 490, 1213, 537, 444, 63, 298, 205, 208}

$$\frac{9\left(11a^2-2b^2\right)\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt[4]{\sec^2(e+fx)}\,b^{7/2}}{8\left(a^2+b^2\right)^{17/4}d^2f\sqrt{d\sec(e+fx)}}-\frac{9\left(11a^2-2b^2\right)\tanh^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt[4]{\sec^2(e+fx)}\,b^{7/}}{8\left(a^2+b^2\right)^{17/4}d^2f\sqrt{d\sec(e+fx)}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((d*Sec[e + f*x])^(5/2)*(a + b*Tan[e + f*x])^3),x]
```

```
[Out] (9*b^(7/2)*(11*a^2 - 2*b^2)*ArcTan[(Sqrt[b]*(Sec[e + f*x]^2)^(1/4))/(a^2 +
b^2)^(1/4)]*(Sec[e + f*x]^2)^(1/4))/(8*(a^2 + b^2)^(17/4)*d^2*f*Sqrt[d*Sec[
e + f*x]]) - (9*b^(7/2)*(11*a^2 - 2*b^2)*ArcTanh[(Sqrt[b]*(Sec[e + f*x]^2)^
(1/4))/(a^2 + b^2)^(1/4)]*(Sec[e + f*x]^2)^(1/4))/(8*(a^2 + b^2)^(17/4)*d^2
*f*Sqrt[d*Sec[e + f*x]]) + (3*a*(8*a^4 + 64*a^2*b^2 - 139*b^4)*EllipticE[Ar
cTan[Tan[e + f*x]]/2, 2]*(Sec[e + f*x]^2)^(1/4))/(20*(a^2 + b^2)^4*d^2*f*Sq
rt[d*Sec[e + f*x]]) - (3*a*(8*a^4 + 64*a^2*b^2 - 139*b^4)*Tan[e + f*x])/(20
*(a^2 + b^2)^4*d^2*f*Sqrt[d*Sec[e + f*x]]) - (9*a*b^3*(11*a^2 - 2*b^2)*Cot[
e + f*x]*EllipticPi[-(b/Sqrt[a^2 + b^2]), ArcSin[(Sec[e + f*x]^2)^(1/4)], -
1]*(Sec[e + f*x]^2)^(1/4)*Sqrt[-Tan[e + f*x]^2])/(8*(a^2 + b^2)^(9/2)*d^2*f
*Sqrt[d*Sec[e + f*x]]) + (9*a*b^3*(11*a^2 - 2*b^2)*Cot[e + f*x]*EllipticPi[
b/Sqrt[a^2 + b^2], ArcSin[(Sec[e + f*x]^2)^(1/4)], -1]*(Sec[e + f*x]^2)^(1/
4)*Sqrt[-Tan[e + f*x]^2])/(8*(a^2 + b^2)^(9/2)*d^2*f*Sqrt[d*Sec[e + f*x]])
+ (3*b*(4*a^4 + 28*a^2*b^2 - 15*b^4)*Sec[e + f*x]^2)/(10*(a^2 + b^2)^3*d^2*
f*Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x])^2) + (2*Cos[e + f*x]^2*(b + a*T
an[e + f*x]))/(5*(a^2 + b^2)*d^2*f*Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x]
)^2) + (3*a*b*(8*a^4 + 64*a^2*b^2 - 139*b^4)*Sec[e + f*x]^2)/(20*(a^2 + b^2
)^4*d^2*f*Sqrt[d*Sec[e + f*x]]*(a + b*Tan[e + f*x])) - (2*(b*(4*a^2 - 9*b^2
```

```
) - a*(3*a^2 + 16*b^2)*Tan[e + f*x]))/(5*(a^2 + b^2)^2*d^2*f*Sqrt[d*Sec[e +
 f*x]]*(a + b*Tan[e + f*x])^2)
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 196

```
Int[((a_) + (b_.)*(x_)^2)^(-5/4), x_Symbol] :> Simp[(2*EllipticE[(1*ArcTan[
Rt[b/a, 2]*x])/2, 2])/(a^(5/4)*Rt[b/a, 2]), x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 227

```
Int[((a_) + (b_.)*(x_)^2)^(-1/4), x_Symbol] :> Simp[(2*x)/(a + b*x^2)^(1/4)
, x] - Dist[a, Int[1/(a + b*x^2)^(5/4), x], x] /; FreeQ[{a, b}, x] && GtQ[a
, 0] && PosQ[b/a]
```

Rule 298

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[-(a/b
), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s/(2*b), Int[1/(r + s*x^2), x
], x] - Dist[s/(2*b), Int[1/(r - s*x^2), x], x]] /; FreeQ[{a, b}, x] &&  !G
tQ[a/b, 0]
```

Rule 399

```
Int[1/(((a_) + (b_.)*(x_)^2)^(1/4)*((c_) + (d_.)*(x_)^2)), x_Symbol] :> Dis
t[(2*Sqrt[-((b*x^2)/a)])/x, Subst[Int[x^2/(Sqrt[1 - x^4/a]*(b*c - a*d + d*x
^4)), x], x, (a + b*x^2)^(1/4)], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c -
a*d, 0]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 490

```
Int[(x_)^2/(((a_) + (b_.)*(x_)^4)*Sqrt[(c_) + (d_.)*(x_)^4]), x_Symbol] :>
With[{r = Numerator[Rt[-(a/b), 2]], s = Denominator[Rt[-(a/b), 2]]}, Dist[s
/(2*b), Int[1/((r + s*x^2)*Sqrt[c + d*x^4]), x], x] - Dist[s/(2*b), Int[1/(
(r - s*x^2)*Sqrt[c + d*x^4]), x], x]] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c
```

```
- a*d, 0]
```

Rule 537

```
Int[1/(((a_) + (b_.)*(x_)^2)*Sqrt[(c_) + (d_.)*(x_)^2]*Sqrt[(e_) + (f_.)*(x
_)^2]), x_Symbol] :> Simp[(1*EllipticPi[(b*c)/(a*d), ArcSin[Rt[-(d/c), 2]*x
], (c*f)/(d*e)])/(a*Sqrt[c]*Sqrt[e]*Rt[-(d/c), 2]), x] /; FreeQ[{a, b, c, d
, e, f}, x] &&  !GtQ[d/c, 0] && GtQ[c, 0] && GtQ[e, 0] &&  !( !GtQ[f/e, 0]
&& SimplerSqrtQ[-(f/e), -(d/c)])
```

Rule 741

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(a*e + c*d*x)*(a + c*x^2)^(p + 1))/(2*a*(p + 1)*(c*d^2
+ a*e^2)), x] + Dist[1/(2*a*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*Simp[
c*d^2*(2*p + 3) + a*e^2*(m + 2*p + 3) + c*e*d*(m + 2*p + 4)*x, x]*(a + c*x^
2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] &&
 LtQ[p, -1] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 746

```
Int[1/(((d_) + (e_.)*(x_))*((a_) + (c_.)*(x_)^2)^(1/4)), x_Symbol] :> Dist[
d, Int[1/((d^2 - e^2*x^2)*(a + c*x^2)^(1/4)), x], x] - Dist[e, Int[x/((d^2
- e^2*x^2)*(a + c*x^2)^(1/4)), x], x] /; FreeQ[{a, c, d, e}, x] && NeQ[c*d^
2 + a*e^2, 0]
```

Rule 823

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_), x_Symbol] :> -Simp[((d + e*x)^(m + 1)*(f*a*c*e - a*g*c*d + c*(c*d*f + a
*e*g)*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)*(c*d^2 + a*e^2)), x] + Dist[1/
(2*a*c*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*(a + c*x^2)^(p + 1)*Simp[f
*(c^2*d^2*(2*p + 3) + a*c*e^2*(m + 2*p + 3)) - a*c*d*e*g*m + c*e*(c*d*f + a
*e*g)*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*
d^2 + a*e^2, 0] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2
*m, 2*p])
```

Rule 835

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Simp[((e*f - d*g)*(d + e*x)^(m + 1)*(a + c*x^2)^(p + 1))/
((m + 1)*(c*d^2 + a*e^2)), x] + Dist[1/((m + 1)*(c*d^2 + a*e^2)), Int[(d +
e*x)^(m + 1)*(a + c*x^2)^p*Simp[(c*d*f + a*e*g)*(m + 1) - c*(e*f - d*g)*(m
+ 2*p + 3)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] && NeQ[c*d^2 +
a*e^2, 0] && LtQ[m, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2*m, 2*
p])
```

Rule 844

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_.), x_Symbol] :> Dist[g/e, Int[(d + e*x)^(m + 1)*(a + c*x^2)^p, x], x] + D
ist[(e*f - d*g)/e, Int[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d,
 e, f, g, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IGtQ[m, 0]
```

Rule 1213

```
Int[1/(((d_) + (e_.)*(x_)^2)*Sqrt[(a_) + (c_.)*(x_)^4]), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[Sqrt[-c], Int[1/((d + e*x^2)*Sqrt[q + c*x^2]*Sqrt
```

```
[q - c*x^2]), x], x]] /; FreeQ[{a, c, d, e}, x] && GtQ[a, 0] && LtQ[c, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{1}{(d\sec(e+fx))^{5/2}(a+b\tan(e+fx))^3}\,dx = \frac{\sqrt[4]{\sec^2(e+fx)}\ \text{Subst}\left(\int \frac{1}{(a+x)^3\left(1+\frac{x^2}{b^2}\right)^{9/4}}\,dx, x, b\tan(e+fx)\right)}{bd^2f\sqrt{d\sec(e+fx)}}$$

$$= \frac{2\cos^2(e+fx)(b+a\tan(e+fx))}{5\left(a^2+b^2\right)d^2f\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^2} - \frac{\left(2b\sqrt[4]{\sec^2(e+\right.}{}$$

$$= \frac{2\cos^2(e+fx)(b+a\tan(e+fx))}{5\left(a^2+b^2\right)d^2f\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^2} - \frac{2\left(b\left(4a^2-\right.\right.}{5\left(a^2+b^2\right)^2 c}$$

$$= \frac{3b\left(4a^4+28a^2b^2-15b^4\right)\sec^2(e+fx)}{10\left(a^2+b^2\right)^3d^2f\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^2} + \frac{2c}{5\left(a^2+b^2\right)}$$

$$= \frac{3b\left(4a^4+28a^2b^2-15b^4\right)\sec^2(e+fx)}{10\left(a^2+b^2\right)^3d^2f\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^2} + \frac{2c}{5\left(a^2+b^2\right)}$$

$$= \frac{3b\left(4a^4+28a^2b^2-15b^4\right)\sec^2(e+fx)}{10\left(a^2+b^2\right)^3d^2f\sqrt{d\sec(e+fx)}\,(a+b\tan(e+fx))^2} + \frac{2c}{5\left(a^2+b^2\right)}$$

$$= -\frac{3a\left(8a^4+64a^2b^2-139b^4\right)\tan(e+fx)}{20\left(a^2+b^2\right)^4d^2f\sqrt{d\sec(e+fx)}} + \frac{3b\left(4a^4+28a^2b\right.}{10\left(a^2+b^2\right)^3d^2f\sqrt{d\,\text{se}}}$$

$$= \frac{3a\left(8a^4+64a^2b^2-139b^4\right)E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt[4]{\sec^2(e+f}}{20\left(a^2+b^2\right)^4d^2f\sqrt{d\sec(e+fx)}}$$

$$= \frac{3a\left(8a^4+64a^2b^2-139b^4\right)E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt[4]{\sec^2(e+f}}{20\left(a^2+b^2\right)^4d^2f\sqrt{d\sec(e+fx)}}$$

$$= \frac{3a\left(8a^4+64a^2b^2-139b^4\right)E\left(\frac{1}{2}\tan^{-1}(\tan(e+fx))\middle|2\right)\sqrt[4]{\sec^2(e+f}}{20\left(a^2+b^2\right)^4d^2f\sqrt{d\sec(e+fx)}}$$

$$= \frac{9b^{7/2}\left(11a^2-2b^2\right)\tan^{-1}\left(\frac{\sqrt{b}\sqrt[4]{\sec^2(e+fx)}}{\sqrt[4]{a^2+b^2}}\right)\sqrt[4]{\sec^2(e+fx)}}{8\left(a^2+b^2\right)^{17/4}d^2f\sqrt{d\sec(e+fx)}} - \frac{9b^{7/2}\left(11\right.}{}$$

Mathematica [C] time = 29.67, size = 15481, normalized size = 19.02

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/((d*Sec[e + f*x])^(5/2)*(a + b*Tan[e + f*x])^3),x]
[Out] Result too large to show
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e))^3,x, algorithm="fricas")
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{2}}\left(b\tan\left(fx+e\right)+a\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e))^3,x, algorithm="giac")
[Out] integrate(1/((d*sec(f*x + e))^(5/2)*(b*tan(f*x + e) + a)^3), x)
```

maple [B] time = 7.74, size = 114399, normalized size = 140.54

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e))^3,x)
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(5/2)/(a+b*tan(f*x+e))^3,x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{5/2}\,{\left(a+b\,\tan\left(e+f\,x\right)\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d/cos(e + f*x))^(5/2)*(a + b*tan(e + f*x))^3),x)
[Out] int(1/((d/cos(e + f*x))^(5/2)*(a + b*tan(e + f*x))^3), x)
```

sympy [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(e+fx\right)\right)^{\frac{5}{2}}\left(a+b\tan\left(e+fx\right)\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))**(5/2)/(a+b*tan(f*x+e))**3,x)
```

```
[Out] Integral(1/((d*sec(e + f*x))**(5/2)*(a + b*tan(e + f*x))**3), x)
```

3.624 $\int (d\sec(e+fx))^{5/3}(a+b\tan(e+fx))\,dx$

Optimal. Leaf size=78

$$\frac{3ad\sin(e+fx)(d\sec(e+fx))^{2/3}\,{}_2F_1\left(-\frac{1}{3},\frac{1}{2};\frac{2}{3};\cos^2(e+fx)\right)}{2f\sqrt{\sin^2(e+fx)}}+\frac{3b(d\sec(e+fx))^{5/3}}{5f}$$

```
[Out] 3/5*b*(d*sec(f*x+e))^(5/3)/f+3/2*a*d*hypergeom([-1/3, 1/2],[2/3],cos(f*x+e)
^2)*(d*sec(f*x+e))^(2/3)*sin(f*x+e)/f/(sin(f*x+e)^2)^(1/2)
```

Rubi [A] time = 0.06, antiderivative size = 78, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {3486, 3772, 2643}

$$\frac{3ad\sin(e+fx)(d\sec(e+fx))^{2/3}\text{Hypergeometric2F1}\left(-\frac{1}{3},\frac{1}{2},\frac{2}{3},\cos^2(e+fx)\right)}{2f\sqrt{\sin^2(e+fx)}}+\frac{3b(d\sec(e+fx))^{5/3}}{5f}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(5/3)*(a + b*Tan[e + f*x]),x]
```

```
[Out] (3*b*(d*Sec[e + f*x])^(5/3))/(5*f) + (3*a*d*Hypergeometric2F1[-1/3, 1/2, 2/
3, Cos[e + f*x]^2]*(d*Sec[e + f*x])^(2/3)*Sin[e + f*x])/(2*f*Sqrt[Sin[e + f
*x]^2])
```

Rule 2643

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Sin[c + d*x])^(n + 1)*Hypergeometric2F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c
+ d*x]^2])/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]), x] /; FreeQ[{b, c, d, n}, x]
 &&  !IntegerQ[2*n]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3772

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(b*Csc[c + d*x]
)^(n - 1)*((Sin[c + d*x]/b)^(n - 1)*Int[1/(Sin[c + d*x]/b)^n, x]), x] /; Fr
eeQ[{b, c, d, n}, x] &&  !IntegerQ[n]
```

Rubi steps

$$\int (d\sec(e+fx))^{5/3}(a+b\tan(e+fx))\,dx=\frac{3b(d\sec(e+fx))^{5/3}}{5f}+a\int (d\sec(e+fx))^{5/3}\,dx$$

$$=\frac{3b(d\sec(e+fx))^{5/3}}{5f}+\left(a\left(\frac{\cos(e+fx)}{d}\right)^{2/3}(d\sec(e+fx))^{2/3}\right)\int$$

$$=\frac{3b(d\sec(e+fx))^{5/3}}{5f}+\frac{3ad\,{}_2F_1\left(-\frac{1}{3},\frac{1}{2};\frac{2}{3};\cos^2(e+fx)\right)(d\sec(e+}{2f\sqrt{\sin^2(e+fx)}}$$

Mathematica [A] time = 0.51, size = 126, normalized size = 1.62

$$\frac{d(d\sec(e+fx))^{2/3}(a+b\tan(e+fx))\left(3\cos^2(e+fx)^{2/3}(5a\sin(2(e+fx))+4b)-10a\sin(e+fx)\cos^3(e+fx)\,{}_2F\right.}{20f\cos^2(e+fx)^{2/3}(a\cos(e+fx)+b\sin(e+fx))}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(5/3)*(a + b*Tan[e + f*x]),x]
```

```
[Out] (d*(d*Sec[e + f*x])^(2/3)*(-10*a*Cos[e + f*x]^3*Hypergeometric2F1[1/3, 1/2,
 3/2, Sin[e + f*x]^2]*Sin[e + f*x] + 3*(Cos[e + f*x]^2)^(2/3)*(4*b + 5*a*Si
n[2*(e + f*x)]))*(a + b*Tan[e + f*x]))/(20*f*(Cos[e + f*x]^2)^(2/3)*(a*Cos[
e + f*x] + b*Sin[e + f*x]))
```

fricas [F] time = 0.99, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(bd\sec\left(fx+e\right)\tan\left(fx+e\right)+ad\sec\left(fx+e\right)\right)\left(d\sec\left(fx+e\right)\right)^{\frac{2}{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)*(a+b*tan(f*x+e)),x, algorithm="fricas")
```

```
[Out] integral((b*d*sec(f*x + e)*tan(f*x + e) + a*d*sec(f*x + e))*(d*sec(f*x + e)
)^(2/3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}\left(b\tan\left(fx+e\right)+a\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)*(a+b*tan(f*x+e)),x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(5/3)*(b*tan(f*x + e) + a), x)
```

maple [F] time = 0.58, size = 0, normalized size = 0.00

$$\int\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}\left(a+b\tan\left(fx+e\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(5/3)*(a+b*tan(f*x+e)),x)
```

```
[Out] int((d*sec(f*x+e))^(5/3)*(a+b*tan(f*x+e)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}\left(b\tan\left(fx+e\right)+a\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)*(a+b*tan(f*x+e)),x, algorithm="maxima")
```

```
[Out] integrate((d*sec(f*x + e))^(5/3)*(b*tan(f*x + e) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{5/3}\,\left(a+b\,\mathrm{tan}\left(e+f\,x\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(5/3)*(a + b*tan(e + f*x)),x)
```

```
[Out] int((d/cos(e + f*x))^(5/3)*(a + b*tan(e + f*x)), x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(e+fx\right)\right)^{\frac{5}{3}}\left(a+b\tan\left(e+fx\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(5/3)*(a+b*tan(f*x+e)),x)
```

```
[Out] Integral((d*sec(e + f*x))**(5/3)*(a + b*tan(e + f*x)), x)
```

3.625 $\int \sqrt[3]{d\sec(e+fx)}\,(a+b\tan(e+fx))\,dx$

Optimal. Leaf size=76

$$\frac{3b\sqrt[3]{d\sec(e+fx)}}{f}-\frac{3ad\sin(e+fx)\,{}_2F_1\left(\frac{1}{3},\frac{1}{2};\frac{4}{3};\cos^2(e+fx)\right)}{2f\sqrt{\sin^2(e+fx)}\,(d\sec(e+fx))^{2/3}}$$

```
[Out] 3*b*(d*sec(f*x+e))^(1/3)/f-3/2*a*d*hypergeom([1/3, 1/2],[4/3],cos(f*x+e)^2)
*sin(f*x+e)/f/(d*sec(f*x+e))^(2/3)/(sin(f*x+e)^2)^(1/2)
```

Rubi [A] time = 0.06, antiderivative size = 76, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {3486, 3772, 2643}

$$\frac{3b\sqrt[3]{d\sec(e+fx)}}{f}-\frac{3ad\sin(e+fx)\text{Hypergeometric2F1}\left(\frac{1}{3},\frac{1}{2},\frac{4}{3},\cos^2(e+fx)\right)}{2f\sqrt{\sin^2(e+fx)}\,(d\sec(e+fx))^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(1/3)*(a + b*Tan[e + f*x]),x]
```

```
[Out] (3*b*(d*Sec[e + f*x])^(1/3))/f - (3*a*d*Hypergeometric2F1[1/3, 1/2, 4/3, Co
s[e + f*x]^2]*Sin[e + f*x])/(2*f*(d*Sec[e + f*x])^(2/3)*Sqrt[Sin[e + f*x]^2
])
```

Rule 2643

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Sin[c + d*x])^(n + 1)*Hypergeometric2F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c
+ d*x]^2])/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]), x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3772

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(b*Csc[c + d*x]
)^(n - 1)*((Sin[c + d*x]/b)^(n - 1)*Int[1/(Sin[c + d*x]/b)^n, x]), x] /; Fr
eeQ[{b, c, d, n}, x] && !IntegerQ[n]
```

Rubi steps

$$\begin{aligned}\int \sqrt[3]{d\sec(e+fx)}\,(a+b\tan(e+fx))\,dx &= \frac{3b\sqrt[3]{d\sec(e+fx)}}{f}+a\int \sqrt[3]{d\sec(e+fx)}\,dx\\ &= \frac{3b\sqrt[3]{d\sec(e+fx)}}{f}+\left(a\sqrt[3]{\frac{\cos(e+fx)}{d}}\sqrt[3]{d\sec(e+fx)}\right)\int \frac{1}{\sqrt[3]{\frac{\cos(e+fx)}{d}}}\\ &= \frac{3b\sqrt[3]{d\sec(e+fx)}}{f}-\frac{3a\cos(e+fx)\,{}_2F_1\left(\frac{1}{3},\frac{1}{2};\frac{4}{3};\cos^2(e+fx)\right)\sqrt[3]{d\sec}}{2f\sqrt{\sin^2(e+fx)}}\end{aligned}$$

Mathematica [A] time = 0.18, size = 58, normalized size = 0.76

$$\frac{\sqrt[3]{d\sec(e+fx)}\left(a\cos^2(e+fx)^{2/3}\tan(e+fx)\,{}_2F_1\left(\frac{1}{2},\frac{2}{3};\frac{3}{2};\sin^2(e+fx)\right)+3b\right)}{f}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(1/3)*(a + b*Tan[e + f*x]),x]
```

```
[Out] ((d*Sec[e + f*x])^(1/3)*(3*b + a*(Cos[e + f*x]^2)^(2/3)*Hypergeometric2F1[1
/2, 2/3, 3/2, Sin[e + f*x]^2]*Tan[e + f*x]))/f
```

fricas [F] time = 0.95, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}\left(b\tan\left(fx+e\right)+a\right),x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)*(a+b*tan(f*x+e)),x, algorithm="fricas")
```

```
[Out] integral((d*sec(f*x + e))^(1/3)*(b*tan(f*x + e) + a), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}\left(b\tan\left(fx+e\right)+a\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)*(a+b*tan(f*x+e)),x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(1/3)*(b*tan(f*x + e) + a), x)
```

maple [F] time = 0.58, size = 0, normalized size = 0.00

$$\int\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}\left(a+b\tan\left(fx+e\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(1/3)*(a+b*tan(f*x+e)),x)
```

```
[Out] int((d*sec(f*x+e))^(1/3)*(a+b*tan(f*x+e)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}\left(b\tan\left(fx+e\right)+a\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)*(a+b*tan(f*x+e)),x, algorithm="maxima")
```

```
[Out] integrate((d*sec(f*x + e))^(1/3)*(b*tan(f*x + e) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{1/3}\,\left(a+b\,\tan\left(e+f\,x\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(1/3)*(a + b*tan(e + f*x)),x)
[Out] int((d/cos(e + f*x))^(1/3)*(a + b*tan(e + f*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt[3]{d\sec\left(e+fx\right)}\,\left(a+b\tan\left(e+fx\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(1/3)*(a+b*tan(f*x+e)),x)
[Out] Integral((d*sec(e + f*x))**(1/3)*(a + b*tan(e + f*x)), x)
```

3.626 $\int \frac{a+b\tan(e+fx)}{\sqrt[3]{d\sec(e+fx)}}\,dx$

Optimal. Leaf size=76

$$-\frac{3ad\sin(e+fx)\,{}_2F_1\left(\frac{1}{2},\frac{2}{3};\frac{5}{3};\cos^2(e+fx)\right)}{4f\sqrt{\sin^2(e+fx)}\,(d\sec(e+fx))^{4/3}}-\frac{3b}{f\sqrt[3]{d\sec(e+fx)}}$$

```
[Out] -3*b/f/(d*sec(f*x+e))^(1/3)-3/4*a*d*hypergeom([1/2, 2/3],[5/3],cos(f*x+e)^2
)*sin(f*x+e)/f/(d*sec(f*x+e))^(4/3)/(sin(f*x+e)^2)^(1/2)
```

Rubi [A] time = 0.06, antiderivative size = 76, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {3486, 3772, 2643}

$$-\frac{3ad\sin(e+fx)\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(e+fx)\right)}{4f\sqrt{\sin^2(e+fx)}\,(d\sec(e+fx))^{4/3}}-\frac{3b}{f\sqrt[3]{d\sec(e+fx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Tan[e + f*x])/(d*Sec[e + f*x])^(1/3),x]
```

```
[Out] (-3*b)/(f*(d*Sec[e + f*x])^(1/3)) - (3*a*d*Hypergeometric2F1[1/2, 2/3, 5/3,
 Cos[e + f*x]^2]*Sin[e + f*x])/(4*f*(d*Sec[e + f*x])^(4/3)*Sqrt[Sin[e + f*x
]^2])
```

Rule 2643

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Sin[c + d*x])^(n + 1)*Hypergeometric2F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c
+ d*x]^2])/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]), x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3772

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(b*Csc[c + d*x]
)^(n - 1)*((Sin[c + d*x]/b)^(n - 1)*Int[1/(Sin[c + d*x]/b)^n, x]), x] /; Fr
eeQ[{b, c, d, n}, x] && !IntegerQ[n]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\tan(e+fx)}{\sqrt[3]{d\sec(e+fx)}}\,dx &= -\frac{3b}{f\sqrt[3]{d\sec(e+fx)}}+a\int \frac{1}{\sqrt[3]{d\sec(e+fx)}}\,dx\\ &= -\frac{3b}{f\sqrt[3]{d\sec(e+fx)}}+\left(a\left(\frac{\cos(e+fx)}{d}\right)^{2/3}(d\sec(e+fx))^{2/3}\right)\int \sqrt[3]{\frac{\cos(e+fx)}{d}}\,dx\\ &= -\frac{3b}{f\sqrt[3]{d\sec(e+fx)}}-\frac{3a\cos^2(e+fx)\,{}_2F_1\left(\frac{1}{2},\frac{2}{3};\frac{5}{3};\cos^2(e+fx)\right)(d\sec(e+fx))^{2/3}\text{si}}{4df\sqrt{\sin^2(e+fx)}}\end{aligned}$$

Mathematica [A] time = 0.93, size = 119, normalized size = 1.57

$$-\frac{3(a\cot(e+fx)+b)\left(a\sqrt{\sin^2(e+fx)}\sqrt{-\tan^2(e+fx)}\cot(e+fx)\,{}_2F_1\left(-\frac{1}{6},\frac{1}{2};\frac{5}{6};\sec^2(e+fx)\right)+b\sin(e+fx)\right)}{f\sqrt[3]{d\sec(e+fx)}\left(a\sqrt{\sin^2(e+fx)}\cot(e+fx)+b\sin(e+fx)\right)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Tan[e + f*x])/(d*Sec[e + f*x])^(1/3),x]
```

```
[Out] (-3*(b + a*Cot[e + f*x])*(b*Sin[e + f*x] + a*Cot[e + f*x]*Hypergeometric2F1
[-1/6, 1/2, 5/6, Sec[e + f*x]^2]*Sqrt[Sin[e + f*x]^2]*Sqrt[-Tan[e + f*x]^2]
))/(f*(d*Sec[e + f*x])^(1/3)*(b*Sin[e + f*x] + a*Cot[e + f*x]*Sqrt[Sin[e +
f*x]^2]))
```

fricas [F] time = 0.82, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(d\sec\left(fx+e\right)\right)^{\frac{2}{3}}\left(b\tan\left(fx+e\right)+a\right)}{d\sec\left(fx+e\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))^(1/3),x, algorithm="fricas")
```

```
[Out] integral((d*sec(f*x + e))^(2/3)*(b*tan(f*x + e) + a)/(d*sec(f*x + e)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{b\tan\left(fx+e\right)+a}{\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))^(1/3),x, algorithm="giac")
```

```
[Out] integrate((b*tan(f*x + e) + a)/(d*sec(f*x + e))^(1/3), x)
```

maple [F] time = 0.58, size = 0, normalized size = 0.00

$$\int\frac{a+b\tan\left(fx+e\right)}{\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*tan(f*x+e))/(d*sec(f*x+e))^(1/3),x)
```

```
[Out] int((a+b*tan(f*x+e))/(d*sec(f*x+e))^(1/3),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{b\tan\left(fx+e\right)+a}{\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))^(1/3),x, algorithm="maxima")
```

```
[Out] integrate((b*tan(f*x + e) + a)/(d*sec(f*x + e))^(1/3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\tan\left(e+f\,x\right)}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{1/3}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(e + f*x))/(d/cos(e + f*x))^(1/3),x)
[Out] int((a + b*tan(e + f*x))/(d/cos(e + f*x))^(1/3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\tan\left(e+fx\right)}{\sqrt[3]{d\sec\left(e+fx\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))**(1/3),x)
[Out] Integral((a + b*tan(e + f*x))/(d*sec(e + f*x))**(1/3), x)
```

3.627 $\int \frac{a+b\tan(e+fx)}{(d\sec(e+fx))^{5/3}}\,dx$

Optimal. Leaf size=78

$$-\frac{3ad\sin(e+fx)\,{}_2F_1\left(\frac{1}{2},\frac{4}{3};\frac{7}{3};\cos^2(e+fx)\right)}{8f\sqrt{\sin^2(e+fx)}\,(d\sec(e+fx))^{8/3}}-\frac{3b}{5f(d\sec(e+fx))^{5/3}}$$

```
[Out] -3/5*b/f/(d*sec(f*x+e))^(5/3)-3/8*a*d*hypergeom([1/2, 4/3],[7/3],cos(f*x+e)
^2)*sin(f*x+e)/f/(d*sec(f*x+e))^(8/3)/(sin(f*x+e)^2)^(1/2)
```

Rubi [A] time = 0.06, antiderivative size = 78, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {3486, 3772, 2643}

$$-\frac{3ad\sin(e+fx)\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{4}{3},\frac{7}{3},\cos^2(e+fx)\right)}{8f\sqrt{\sin^2(e+fx)}\,(d\sec(e+fx))^{8/3}}-\frac{3b}{5f(d\sec(e+fx))^{5/3}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Tan[e + f*x])/(d*Sec[e + f*x])^(5/3),x]
```

```
[Out] (-3*b)/(5*f*(d*Sec[e + f*x])^(5/3)) - (3*a*d*Hypergeometric2F1[1/2, 4/3, 7/
3, Cos[e + f*x]^2]*Sin[e + f*x])/(8*f*(d*Sec[e + f*x])^(8/3)*Sqrt[Sin[e + f
*x]^2])
```

Rule 2643

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Sin[c + d*x])^(n + 1)*Hypergeometric2F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c
+ d*x]^2])/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]), x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3772

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(b*Csc[c + d*x]
)^(n - 1)*((Sin[c + d*x]/b)^(n - 1)*Int[1/(Sin[c + d*x]/b)^n, x]), x] /; Fr
eeQ[{b, c, d, n}, x] && !IntegerQ[n]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\tan(e+fx)}{(d\sec(e+fx))^{5/3}}\,dx &= -\frac{3b}{5f(d\sec(e+fx))^{5/3}}+a\int \frac{1}{(d\sec(e+fx))^{5/3}}\,dx\\
&= -\frac{3b}{5f(d\sec(e+fx))^{5/3}}+\left(a\sqrt[3]{\frac{\cos(e+fx)}{d}}\sqrt[3]{d\sec(e+fx)}\right)\int \left(\frac{\cos(e+fx)}{d}\right)^{5/3}dx\\
&= -\frac{3b}{5f(d\sec(e+fx))^{5/3}}-\frac{3a\cos^3(e+fx)\,{}_2F_1\left(\frac{1}{2},\frac{4}{3};\frac{7}{3};\cos^2(e+fx)\right)\sqrt[3]{d\sec(e+fx)}\,\sin}{8d^2f\sqrt{\sin^2(e+fx)}}
\end{aligned}$$

Mathematica [A] time = 0.43, size = 94, normalized size = 1.21

$$\frac{3\sqrt[3]{\cos^2(e+fx)}\,(a\sin(e+fx)-b\cos(e+fx))+2a\sin(e+fx)\,{}_2F_1\left(\frac{1}{2},\frac{2}{3};\frac{3}{2};\sin^2(e+fx)\right)}{5df\sqrt[3]{\cos^2(e+fx)}\,(d\sec(e+fx))^{2/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Tan[e + f*x])/(d*Sec[e + f*x])^(5/3),x]
```

```
[Out] (2*a*Hypergeometric2F1[1/2, 2/3, 3/2, Sin[e + f*x]^2]*Sin[e + f*x] + 3*(Cos
[e + f*x]^2)^(1/3)*(-(b*Cos[e + f*x]) + a*Sin[e + f*x]))/(5*d*f*(Cos[e + f*
x]^2)^(1/3)*(d*Sec[e + f*x])^(2/3))
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}\left(b\tan\left(fx+e\right)+a\right)}{d^2\sec\left(fx+e\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))^(5/3),x, algorithm="fricas")
```

```
[Out] integral((d*sec(f*x + e))^(1/3)*(b*tan(f*x + e) + a)/(d^2*sec(f*x + e)^2),
x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{b\tan\left(fx+e\right)+a}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))^(5/3),x, algorithm="giac")
```

```
[Out] integrate((b*tan(f*x + e) + a)/(d*sec(f*x + e))^(5/3), x)
```

maple [F] time = 0.52, size = 0, normalized size = 0.00

$$\int\frac{a+b\tan\left(fx+e\right)}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*tan(f*x+e))/(d*sec(f*x+e))^(5/3),x)
```

```
[Out] int((a+b*tan(f*x+e))/(d*sec(f*x+e))^(5/3),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{b\tan\left(fx+e\right)+a}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))^(5/3),x, algorithm="maxima")
```

```
[Out] integrate((b*tan(f*x + e) + a)/(d*sec(f*x + e))^(5/3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\tan\left(e+f\,x\right)}{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{5/3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(e + f*x))/(d/cos(e + f*x))^(5/3),x)
[Out] int((a + b*tan(e + f*x))/(d/cos(e + f*x))^(5/3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\tan\left(e+fx\right)}{\left(d\sec\left(e+fx\right)\right)^{\frac{5}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))/(d*sec(f*x+e))**(5/3),x)
[Out] Integral((a + b*tan(e + f*x))/(d*sec(e + f*x))**(5/3), x)
```

3.628 $\int (d\sec(e+fx))^{5/3}(a+b\tan(e+fx))^2\,dx$

Optimal. Leaf size=119

$$\frac{3d\left(8a^2-3b^2\right)\sin(e+fx)(d\sec(e+fx))^{2/3}\,{}_2F_1\left(-\frac{1}{3},\frac{1}{2};\frac{2}{3};\cos^2(e+fx)\right)}{16f\sqrt{\sin^2(e+fx)}}+\frac{33ab(d\sec(e+fx))^{5/3}}{40f}+\frac{3b(d\sec(e+$$

```
[Out] 33/40*a*b*(d*sec(f*x+e))^(5/3)/f+3/16*(8*a^2-3*b^2)*d*hypergeom([-1/3, 1/2]
,[2/3],cos(f*x+e)^2)*(d*sec(f*x+e))^(2/3)*sin(f*x+e)/f/(sin(f*x+e)^2)^(1/2)
+3/8*b*(d*sec(f*x+e))^(5/3)*(a+b*tan(f*x+e))/f
```

Rubi [A] time = 0.15, antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.160$, Rules used = {3508, 3486, 3772, 2643}

$$\frac{3d\left(8a^2-3b^2\right)\sin(e+fx)(d\sec(e+fx))^{2/3}\text{Hypergeometric2F1}\left(-\frac{1}{3},\frac{1}{2},\frac{2}{3},\cos^2(e+fx)\right)}{16f\sqrt{\sin^2(e+fx)}}+\frac{33ab(d\sec(e+fx}{40f}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(5/3)*(a + b*Tan[e + f*x])^2,x]
```

```
[Out] (33*a*b*(d*Sec[e + f*x])^(5/3))/(40*f) + (3*(8*a^2 - 3*b^2)*d*Hypergeometri
c2F1[-1/3, 1/2, 2/3, Cos[e + f*x]^2]*(d*Sec[e + f*x])^(2/3)*Sin[e + f*x])/(
16*f*Sqrt[Sin[e + f*x]^2]) + (3*b*(d*Sec[e + f*x])^(5/3)*(a + b*Tan[e + f*x
]))/(8*f)
```

Rule 2643

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Sin[c + d*x])^(n + 1)*Hypergeometric2F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c
+ d*x]^2])/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]), x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3508

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^2, x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(
m + 1)), x] + Dist[1/(m + 1), Int[(d*Sec[e + f*x])^m*(a^2*(m + 1) - b^2 + a
*b*(m + 2)*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, m}, x] && NeQ[a^2
 + b^2, 0] && NeQ[m, -1]
```

Rule 3772

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(b*Csc[c + d*x]
)^(n - 1)*((Sin[c + d*x]/b)^(n - 1)*Int[1/(Sin[c + d*x]/b)^n, x]), x] /; Fr
eeQ[{b, c, d, n}, x] && !IntegerQ[n]
```

Rubi steps

$$\int (d\sec(e+fx))^{5/3}(a+b\tan(e+fx))^2\,dx = \frac{3b(d\sec(e+fx))^{5/3}(a+b\tan(e+fx))}{8f} + \frac{3}{8}\int (d\sec(e+fx))^{5/3}\Big(\frac{8a}{3}$$

$$= \frac{33ab(d\sec(e+fx))^{5/3}}{40f} + \frac{3b(d\sec(e+fx))^{5/3}(a+b\tan(e+fx))}{8f} +$$

$$= \frac{33ab(d\sec(e+fx))^{5/3}}{40f} + \frac{3b(d\sec(e+fx))^{5/3}(a+b\tan(e+fx))}{8f} +$$

$$= \frac{33ab(d\sec(e+fx))^{5/3}}{40f} + \frac{3\left(8a^2-3b^2\right)d\,{}_2F_1\left(-\frac{1}{3},\frac{1}{2};\frac{2}{3};\cos^2(e+fx)\right)}{16f\sqrt{\sin^2(e+}$$

Mathematica [A] time = 1.71, size = 108, normalized size = 0.91

$$\frac{(d\sec(e+fx))^{5/3}\left(-5\left(8a^2-3b^2\right)\sin(2(e+fx))\sqrt[3]{\cos^2(e+fx)}\,{}_2F_1\left(\frac{1}{3},\frac{1}{2};\frac{3}{2};\sin^2(e+fx)\right)+15\left(8a^2-3b^2\right)\sin(2(\right.}{160f}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(5/3)*(a + b*Tan[e + f*x])^2,x]
```

```
[Out] ((d*Sec[e + f*x])^(5/3)*(15*(8*a^2 - 3*b^2)*Sin[2*(e + f*x)] - 5*(8*a^2 - 3
*b^2)*(Cos[e + f*x]^2)^(1/3)*Hypergeometric2F1[1/3, 1/2, 3/2, Sin[e + f*x]^
2]*Sin[2*(e + f*x)] + 12*b*(16*a + 5*b*Tan[e + f*x])))/(160*f)
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(b^2d\sec\left(fx+e\right)\tan\left(fx+e\right)^2+2\,abd\sec\left(fx+e\right)\tan\left(fx+e\right)+a^2d\sec\left(fx+e\right)\right)\left(d\sec\left(fx+e\right)\right)^{\frac{2}{3}},\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)*(a+b*tan(f*x+e))^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*d*sec(f*x + e)*tan(f*x + e)^2 + 2*a*b*d*sec(f*x + e)*tan(f*x
 + e) + a^2*d*sec(f*x + e))*(d*sec(f*x + e))^(2/3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}\left(b\tan\left(fx+e\right)+a\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)*(a+b*tan(f*x+e))^2,x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(5/3)*(b*tan(f*x + e) + a)^2, x)
```

maple [F] time = 0.68, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}\left(a+b\tan\left(fx+e\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(5/3)*(a+b*tan(f*x+e))^2,x)
```

```
[Out] int((d*sec(f*x+e))^(5/3)*(a+b*tan(f*x+e))^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}\left(b\tan\left(fx+e\right)+a\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)*(a+b*tan(f*x+e))^2,x, algorithm="maxima")
[Out] integrate((d*sec(f*x + e))^(5/3)*(b*tan(f*x + e) + a)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{5/3}\,{\left(a+b\,\tan\left(e+f\,x\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(5/3)*(a + b*tan(e + f*x))^2,x)
[Out] int((d/cos(e + f*x))^(5/3)*(a + b*tan(e + f*x))^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(5/3)*(a+b*tan(f*x+e))**2,x)
[Out] Timed out
```

3.629 $\int \sqrt[3]{d\sec(e+fx)}\,(a+b\tan(e+fx))^2\,dx$

Optimal. Leaf size=119

$$-\frac{3d\left(4a^2-3b^2\right)\sin(e+fx)\,{}_2F_1\left(\frac{1}{3},\frac{1}{2};\frac{4}{3};\cos^2(e+fx)\right)}{8f\sqrt{\sin^2(e+fx)}\,(d\sec(e+fx))^{2/3}}+\frac{21ab\sqrt[3]{d\sec(e+fx)}}{4f}+\frac{3b\sqrt[3]{d\sec(e+fx)}\,(a+b\tan(e+f$$

```
[Out] 21/4*a*b*(d*sec(f*x+e))^(1/3)/f-3/8*(4*a^2-3*b^2)*d*hypergeom([1/3, 1/2],[4
/3],cos(f*x+e)^2)*sin(f*x+e)/f/(d*sec(f*x+e))^(2/3)/(sin(f*x+e)^2)^(1/2)+3/
4*b*(d*sec(f*x+e))^(1/3)*(a+b*tan(f*x+e))/f
```

Rubi [A] time = 0.14, antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {3508, 3486, 3772, 2643}

$$-\frac{3d\left(4a^2-3b^2\right)\sin(e+fx)\text{Hypergeometric2F1}\left(\frac{1}{3},\frac{1}{2},\frac{4}{3},\cos^2(e+fx)\right)}{8f\sqrt{\sin^2(e+fx)}\,(d\sec(e+fx))^{2/3}}+\frac{21ab\sqrt[3]{d\sec(e+fx)}}{4f}+\frac{3b\sqrt[3]{d\sec(e+f$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(1/3)*(a + b*Tan[e + f*x])^2,x]
```

```
[Out] (21*a*b*(d*Sec[e + f*x])^(1/3))/(4*f) - (3*(4*a^2 - 3*b^2)*d*Hypergeometric
2F1[1/3, 1/2, 4/3, Cos[e + f*x]^2]*Sin[e + f*x])/(8*f*(d*Sec[e + f*x])^(2/3
)*Sqrt[Sin[e + f*x]^2]) + (3*b*(d*Sec[e + f*x])^(1/3)*(a + b*Tan[e + f*x]))
/(4*f)
```

Rule 2643

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Sin[c + d*x])^(n + 1)*Hypergeometric2F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c
+ d*x]^2])/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]), x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3508

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^2, x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(
m + 1)), x] + Dist[1/(m + 1), Int[(d*Sec[e + f*x])^m*(a^2*(m + 1) - b^2 + a
*b*(m + 2)*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, m}, x] && NeQ[a^2
 + b^2, 0] && NeQ[m, -1]
```

Rule 3772

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(b*Csc[c + d*x]
)^(n - 1)*((Sin[c + d*x]/b)^(n - 1)*Int[1/(Sin[c + d*x]/b)^n, x]), x] /; Fr
eeQ[{b, c, d, n}, x] && !IntegerQ[n]
```

Rubi steps

$$\int \sqrt[3]{d\sec(e+fx)}\,(a+b\tan(e+fx))^2\,dx = \frac{3b\sqrt[3]{d\sec(e+fx)}\,(a+b\tan(e+fx))}{4f} + \frac{3}{4}\int \sqrt[3]{d\sec(e+fx)}\left(\frac{4a^2}{3}\right.$$
$$= \frac{21ab\sqrt[3]{d\sec(e+fx)}}{4f} + \frac{3b\sqrt[3]{d\sec(e+fx)}\,(a+b\tan(e+fx))}{4f} + \frac{1}{4}$$
$$= \frac{21ab\sqrt[3]{d\sec(e+fx)}}{4f} + \frac{3b\sqrt[3]{d\sec(e+fx)}\,(a+b\tan(e+fx))}{4f} + \frac{1}{4}$$
$$= \frac{21ab\sqrt[3]{d\sec(e+fx)}}{4f} - \frac{3\left(4a^2-3b^2\right)\cos(e+fx)\,{}_2F_1\left(\frac{1}{3},\frac{1}{2};\frac{4}{3};\cos^2\right.}{8f\sqrt{\sin^2(e}}$$

Mathematica [A] time = 0.48, size = 83, normalized size = 0.70

$$\frac{\sqrt[3]{d\sec(e+fx)}\left(\left(4a^2-3b^2\right)\cos^2(e+fx)^{2/3}\tan(e+fx)\,{}_2F_1\left(\frac{1}{2},\frac{2}{3};\frac{3}{2};\sin^2(e+fx)\right)+3b(8a+b\tan(e+fx))\right)}{4f}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^(1/3)*(a + b*Tan[e + f*x])^2,x]
```

```
[Out] ((d*Sec[e + f*x])^(1/3)*((4*a^2 - 3*b^2)*(Cos[e + f*x]^2)^(2/3)*Hypergeomet
ric2F1[1/2, 2/3, 3/2, Sin[e + f*x]^2]*Tan[e + f*x] + 3*b*(8*a + b*Tan[e + f
*x])))/(4*f)
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(b^2\tan\left(fx+e\right)^2+2\,ab\tan\left(fx+e\right)+a^2\right)\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)*(a+b*tan(f*x+e))^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*tan(f*x + e)^2 + 2*a*b*tan(f*x + e) + a^2)*(d*sec(f*x + e))^(
1/3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}\left(b\tan\left(fx+e\right)+a\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)*(a+b*tan(f*x+e))^2,x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(1/3)*(b*tan(f*x + e) + a)^2, x)
```

maple [F] time = 0.63, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}\left(a+b\tan\left(fx+e\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(1/3)*(a+b*tan(f*x+e))^2,x)
```

```
[Out] int((d*sec(f*x+e))^(1/3)*(a+b*tan(f*x+e))^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}\left(b\tan\left(fx+e\right)+a\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)*(a+b*tan(f*x+e))^2,x, algorithm="maxima")
[Out] integrate((d*sec(f*x + e))^(1/3)*(b*tan(f*x + e) + a)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{1/3}\,{\left(a+b\,\tan\left(e+f\,x\right)\right)}^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(1/3)*(a + b*tan(e + f*x))^2,x)
[Out] int((d/cos(e + f*x))^(1/3)*(a + b*tan(e + f*x))^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt[3]{d\sec\left(e+fx\right)}\left(a+b\tan\left(e+fx\right)\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(1/3)*(a+b*tan(f*x+e))**2,x)
[Out] Integral((d*sec(e + f*x))**(1/3)*(a + b*tan(e + f*x))**2, x)
```

3.630 $\int \frac{(a+b\tan(e+fx))^2}{\sqrt[3]{d\sec(e+fx)}}\,dx$

Optimal. Leaf size=119

$$-\frac{3d\left(2a^2-3b^2\right)\sin(e+fx)\,{}_2F_1\left(\frac{1}{2},\frac{2}{3};\frac{5}{3};\cos^2(e+fx)\right)}{8f\sqrt{\sin^2(e+fx)}\,(d\sec(e+fx))^{4/3}}-\frac{15ab}{2f\sqrt[3]{d\sec(e+fx)}}+\frac{3b(a+b\tan(e+fx))}{2f\sqrt[3]{d\sec(e+fx)}}$$

```
[Out] -15/2*a*b/f/(d*sec(f*x+e))^(1/3)-3/8*(2*a^2-3*b^2)*d*hypergeom([1/2, 2/3],[
5/3],cos(f*x+e)^2)*sin(f*x+e)/f/(d*sec(f*x+e))^(4/3)/(sin(f*x+e)^2)^(1/2)+3
/2*b*(a+b*tan(f*x+e))/f/(d*sec(f*x+e))^(1/3)
```

Rubi [A] time = 0.14, antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {3508, 3486, 3772, 2643}

$$-\frac{3d\left(2a^2-3b^2\right)\sin(e+fx)\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{2}{3},\frac{5}{3},\cos^2(e+fx)\right)}{8f\sqrt{\sin^2(e+fx)}\,(d\sec(e+fx))^{4/3}}-\frac{15ab}{2f\sqrt[3]{d\sec(e+fx)}}+\frac{3b(a+b\tan(e+fx))}{2f\sqrt[3]{d\sec(e+fx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Tan[e + f*x])^2/(d*Sec[e + f*x])^(1/3),x]
```

```
[Out] (-15*a*b)/(2*f*(d*Sec[e + f*x])^(1/3)) - (3*(2*a^2 - 3*b^2)*d*Hypergeometri
c2F1[1/2, 2/3, 5/3, Cos[e + f*x]^2]*Sin[e + f*x])/(8*f*(d*Sec[e + f*x])^(4/
3)*Sqrt[Sin[e + f*x]^2]) + (3*b*(a + b*Tan[e + f*x]))/(2*f*(d*Sec[e + f*x])
^(1/3))
```

Rule 2643

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Sin[c + d*x])^(n + 1)*Hypergeometric2F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c
+ d*x]^2])/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]), x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3508

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^2, x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(
m + 1)), x] + Dist[1/(m + 1), Int[(d*Sec[e + f*x])^m*(a^2*(m + 1) - b^2 + a
*b*(m + 2)*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, m}, x] && NeQ[a^2
 + b^2, 0] && NeQ[m, -1]
```

Rule 3772

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(b*Csc[c + d*x]
)^(n - 1)*((Sin[c + d*x]/b)^(n - 1)*Int[1/(Sin[c + d*x]/b)^n, x]), x] /; Fr
eeQ[{b, c, d, n}, x] && !IntegerQ[n]
```

Rubi steps

$$\int \frac{(a+b\tan(e+fx))^2}{\sqrt[3]{d\sec(e+fx)}}\,dx = \frac{3b(a+b\tan(e+fx))}{2f\sqrt[3]{d\sec(e+fx)}} + \frac{3}{2}\int \frac{\frac{2a^2}{3}-b^2+\frac{5}{3}ab\tan(e+fx)}{\sqrt[3]{d\sec(e+fx)}}\,dx$$
$$= -\frac{15ab}{2f\sqrt[3]{d\sec(e+fx)}} + \frac{3b(a+b\tan(e+fx))}{2f\sqrt[3]{d\sec(e+fx)}} + \frac{1}{2}\left(2a^2-3b^2\right)\int \frac{1}{\sqrt[3]{d\sec(e+fx)}}\,dx$$
$$= -\frac{15ab}{2f\sqrt[3]{d\sec(e+fx)}} + \frac{3b(a+b\tan(e+fx))}{2f\sqrt[3]{d\sec(e+fx)}} + \frac{1}{2}\left(\left(2a^2-3b^2\right)\left(\frac{\cos(e+fx)}{d}\right)^{2/3}(d\,\text{se}$$
$$= -\frac{15ab}{2f\sqrt[3]{d\sec(e+fx)}} - \frac{3\left(2a^2-3b^2\right)\cos^2(e+fx)\,{}_2F_1\left(\frac{1}{2},\frac{2}{3};\frac{5}{3};\cos^2(e+fx)\right)(d\sec(e}{8df\sqrt{\sin^2(e+fx)}}$$

Mathematica [A] time = 3.94, size = 209, normalized size = 1.76

$$\frac{3d\sin(e+fx)(a+b\tan(e+fx))^2\left(\frac{\left(\left(2a^2-3b^2\right)\cot(e+fx)+4ab\right)\left(\left(2a^2-3b^2\right)\sqrt{\sin^2(e+fx)}\,{}_2F_1\left(-\frac{1}{6},\frac{1}{2};\frac{5}{6};\sec^2(e+fx)\right)-4ab\cos(e+fx)\sqrt{-\tan^2}\right.}{\sqrt{-\tan^2(e+fx)}\left(\left(2a^2-3b^2\right)\sqrt{\sin^2(e+fx)}\cot(e+fx)+4ab\sin(e+fx)\right)}}{2f(d\sec(e+fx))^{4/3}(a\cos(e+fx)+b\sin(e+fx))^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*Tan[e + f*x])^2/(d*Sec[e + f*x])^(1/3),x]
```

```
[Out] (3*d*Sin[e + f*x]*(a + b*Tan[e + f*x])^2*(b^2 + ((4*a*b + (2*a^2 - 3*b^2)*C
ot[e + f*x])*((2*a^2 - 3*b^2)*Hypergeometric2F1[-1/6, 1/2, 5/6, Sec[e + f*x
]^2]*Sqrt[Sin[e + f*x]^2] - 4*a*b*Cos[e + f*x]*Sqrt[-Tan[e + f*x]^2]))/((4*
a*b*Sin[e + f*x] + (2*a^2 - 3*b^2)*Cot[e + f*x]*Sqrt[Sin[e + f*x]^2])*Sqrt[
-Tan[e + f*x]^2])))/(2*f*(d*Sec[e + f*x])^(4/3)*(a*Cos[e + f*x] + b*Sin[e +
 f*x])^2)
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(b^2\tan\left(fx+e\right)^2+2\,ab\tan\left(fx+e\right)+a^2\right)\left(d\sec\left(fx+e\right)\right)^{\frac{2}{3}}}{d\sec\left(fx+e\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(1/3),x, algorithm="fricas")
```

```
[Out] integral((b^2*tan(f*x + e)^2 + 2*a*b*tan(f*x + e) + a^2)*(d*sec(f*x + e))^(
2/3)/(d*sec(f*x + e)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\tan\left(fx+e\right)+a\right)^2}{\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(1/3),x, algorithm="giac")
```

```
[Out] integrate((b*tan(f*x + e) + a)^2/(d*sec(f*x + e))^(1/3), x)
```

maple [F] time = 0.59, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\tan\left(fx+e\right)\right)^{2}}{\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(1/3),x)
[Out] int((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(1/3),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\tan\left(fx+e\right)+a\right)^{2}}{\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(1/3),x, algorithm="maxima")
[Out] integrate((b*tan(f*x + e) + a)^2/(d*sec(f*x + e))^(1/3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\tan\left(e+f\,x\right)\right)^2}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{1/3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(e + f*x))^2/(d/cos(e + f*x))^(1/3),x)
[Out] int((a + b*tan(e + f*x))^2/(d/cos(e + f*x))^(1/3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\tan\left(e+fx\right)\right)^{2}}{\sqrt[3]{d\sec\left(e+fx\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))**2/(d*sec(f*x+e))**(1/3),x)
[Out] Integral((a + b*tan(e + f*x))**2/(d*sec(e + f*x))**(1/3), x)
```

3.631 $\int \frac{(a+b\tan(e+fx))^2}{(d\sec(e+fx))^{5/3}}\,dx$

Optimal. Leaf size=119

$$-\frac{3d\left(2a^2+3b^2\right)\sin(e+fx)\,{}_2F_1\left(\frac{1}{2},\frac{4}{3};\frac{7}{3};\cos^2(e+fx)\right)}{16f\sqrt{\sin^2(e+fx)}\,(d\sec(e+fx))^{8/3}}+\frac{3ab}{10f(d\sec(e+fx))^{5/3}}-\frac{3b(a+b\tan(e+fx))}{2f(d\sec(e+fx))^{5/3}}$$

```
[Out] 3/10*a*b/f/(d*sec(f*x+e))^(5/3)-3/16*(2*a^2+3*b^2)*d*hypergeom([1/2, 4/3],[
7/3],cos(f*x+e)^2)*sin(f*x+e)/f/(d*sec(f*x+e))^(8/3)/(sin(f*x+e)^2)^(1/2)-3
/2*b*(a+b*tan(f*x+e))/f/(d*sec(f*x+e))^(5/3)
```

Rubi [A] time = 0.15, antiderivative size = 119, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {3508, 3486, 3772, 2643}

$$-\frac{3d\left(2a^2+3b^2\right)\sin(e+fx)\text{Hypergeometric2F1}\left(\frac{1}{2},\frac{4}{3},\frac{7}{3},\cos^2(e+fx)\right)}{16f\sqrt{\sin^2(e+fx)}\,(d\sec(e+fx))^{8/3}}+\frac{3ab}{10f(d\sec(e+fx))^{5/3}}-\frac{3b(a+b\tan(e+fx))}{2f(d\sec(e+fx))^{5/3}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*Tan[e + f*x])^2/(d*Sec[e + f*x])^(5/3),x]
```

```
[Out] (3*a*b)/(10*f*(d*Sec[e + f*x])^(5/3)) - (3*(2*a^2 + 3*b^2)*d*Hypergeometric
2F1[1/2, 4/3, 7/3, Cos[e + f*x]^2]*Sin[e + f*x])/(16*f*(d*Sec[e + f*x])^(8/
3)*Sqrt[Sin[e + f*x]^2]) - (3*b*(a + b*Tan[e + f*x]))/(2*f*(d*Sec[e + f*x])
^(5/3))
```

Rule 2643

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Sin[c + d*x])^(n + 1)*Hypergeometric2F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c
+ d*x]^2])/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]), x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3508

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^2, x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(
m + 1)), x] + Dist[1/(m + 1), Int[(d*Sec[e + f*x])^m*(a^2*(m + 1) - b^2 + a
*b*(m + 2)*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, m}, x] && NeQ[a^2
 + b^2, 0] && NeQ[m, -1]
```

Rule 3772

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(b*Csc[c + d*x]
)^(n - 1)*((Sin[c + d*x]/b)^(n - 1)*Int[1/(Sin[c + d*x]/b)^n, x]), x] /; Fr
eeQ[{b, c, d, n}, x] && !IntegerQ[n]
```

Rubi steps

$$\int \frac{(a+b\tan(e+fx))^2}{(d\sec(e+fx))^{5/3}}\,dx = -\frac{3b(a+b\tan(e+fx))}{2f(d\sec(e+fx))^{5/3}} - \frac{3}{2}\int \frac{-\frac{2a^2}{3}-b^2+\frac{1}{3}ab\tan(e+fx)}{(d\sec(e+fx))^{5/3}}\,dx$$

$$= \frac{3ab}{10f(d\sec(e+fx))^{5/3}} - \frac{3b(a+b\tan(e+fx))}{2f(d\sec(e+fx))^{5/3}} - \frac{1}{2}\left(-2a^2-3b^2\right)\int \frac{1}{(d\sec(e+fx)}$$

$$= \frac{3ab}{10f(d\sec(e+fx))^{5/3}} - \frac{3b(a+b\tan(e+fx))}{2f(d\sec(e+fx))^{5/3}} - \frac{1}{2}\left(\left(-2a^2-3b^2\right)\sqrt[3]{\frac{\cos(e+fx)}{d}}\right.$$

$$= \frac{3ab}{10f(d\sec(e+fx))^{5/3}} - \frac{3\left(2a^2+3b^2\right)\cos^3(e+fx)\,{}_2F_1\left(\frac{1}{2},\frac{4}{3};\frac{7}{3};\cos^2(e+fx)\right)\sqrt[3]{d}}{16d^2f\sqrt{\sin^2(e+fx)}}$$

Mathematica [A] time = 0.52, size = 119, normalized size = 1.00

$$\frac{\sec^2(e+fx)\left(2\left(2a^2+3b^2\right)\cos^2(e+fx)^{2/3}\tan(e+fx)\,{}_2F_1\left(\frac{1}{2},\frac{2}{3};\frac{3}{2};\sin^2(e+fx)\right)+3a^2\sin(2(e+fx))-6ab\,c\right.}{10f(d\sec(e+fx))^{5/3}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*Tan[e + f*x])^2/(d*Sec[e + f*x])^(5/3),x]
```

```
[Out] (Sec[e + f*x]^2*(-6*a*b - 6*a*b*Cos[2*(e + f*x)] + 3*a^2*Sin[2*(e + f*x)] -
 3*b^2*Sin[2*(e + f*x)] + 2*(2*a^2 + 3*b^2)*(Cos[e + f*x]^2)^(2/3)*Hypergeo
metric2F1[1/2, 2/3, 3/2, Sin[e + f*x]^2]*Tan[e + f*x]))/(10*f*(d*Sec[e + f*
x])^(5/3))
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(b^2\tan\left(fx+e\right)^2+2\,ab\tan\left(fx+e\right)+a^2\right)\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}}{d^2\sec\left(fx+e\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(5/3),x, algorithm="fricas")
```

```
[Out] integral((b^2*tan(f*x + e)^2 + 2*a*b*tan(f*x + e) + a^2)*(d*sec(f*x + e))^(
1/3)/(d^2*sec(f*x + e)^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\tan\left(fx+e\right)+a\right)^2}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(5/3),x, algorithm="giac")
```

```
[Out] integrate((b*tan(f*x + e) + a)^2/(d*sec(f*x + e))^(5/3), x)
```

maple [F] time = 0.60, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\tan\left(fx+e\right)\right)^2}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(5/3),x)
```

```
[Out] int((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(5/3),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(b\tan\left(fx+e\right)+a\right)^2}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))^2/(d*sec(f*x+e))^(5/3),x, algorithm="maxima")
```

```
[Out] integrate((b*tan(f*x + e) + a)^2/(d*sec(f*x + e))^(5/3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\tan\left(e+f\,x\right)\right)^2}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{5/3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(e + f*x))^2/(d/cos(e + f*x))^(5/3),x)
```

```
[Out] int((a + b*tan(e + f*x))^2/(d/cos(e + f*x))^(5/3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\tan\left(e+fx\right)\right)^2}{\left(d\sec\left(e+fx\right)\right)^{\frac{5}{3}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*tan(f*x+e))**2/(d*sec(f*x+e))**(5/3),x)
```

```
[Out] Integral((a + b*tan(e + f*x))**2/(d*sec(e + f*x))**(5/3), x)
```

3.632 $\int \frac{(d\sec(e+fx))^{5/3}}{a+b\tan(e+fx)}\,dx$

Optimal. Leaf size=552

$$\frac{\tan(e+fx)(d\sec(e+fx))^{5/3}F_1\left(\frac{1}{2};1,\frac{1}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{af\sec^2(e+fx)^{5/6}}+\frac{(d\sec(e+fx))^{5/3}\log\left(-\sqrt[3]{b}\sqrt[6]{a^2+b^2}\right.}{4b^{2/3}f\sqrt[6]{a^2}}$$

```
[Out] -arctanh(b^(1/3)*(sec(f*x+e)^2)^(1/6)/(a^2+b^2)^(1/6))*(d*sec(f*x+e))^(5/3)
/b^(2/3)/(a^2+b^2)^(1/6)/f/(sec(f*x+e)^2)^(5/6)+1/4*ln((a^2+b^2)^(1/3)-b^(1
/3)*(a^2+b^2)^(1/6)*(sec(f*x+e)^2)^(1/6)+b^(2/3)*(sec(f*x+e)^2)^(1/3))*(d*s
ec(f*x+e))^(5/3)/b^(2/3)/(a^2+b^2)^(1/6)/f/(sec(f*x+e)^2)^(5/6)-1/4*ln((a^2
+b^2)^(1/3)+b^(1/3)*(a^2+b^2)^(1/6)*(sec(f*x+e)^2)^(1/6)+b^(2/3)*(sec(f*x+e
)^2)^(1/3))*(d*sec(f*x+e))^(5/3)/b^(2/3)/(a^2+b^2)^(1/6)/f/(sec(f*x+e)^2)^(
5/6)+1/2*arctan(-1/3*3^(1/2)+2/3*b^(1/3)*(sec(f*x+e)^2)^(1/6)/(a^2+b^2)^(1/
6)*3^(1/2))*(d*sec(f*x+e))^(5/3)*3^(1/2)/b^(2/3)/(a^2+b^2)^(1/6)/f/(sec(f*x
+e)^2)^(5/6)+1/2*arctan(1/3*3^(1/2)+2/3*b^(1/3)*(sec(f*x+e)^2)^(1/6)/(a^2+b
^2)^(1/6)*3^(1/2))*(d*sec(f*x+e))^(5/3)*3^(1/2)/b^(2/3)/(a^2+b^2)^(1/6)/f/(
sec(f*x+e)^2)^(5/6)+AppellF1(1/2,1,1/6,3/2,b^2*tan(f*x+e)^2/a^2,-tan(f*x+e)
^2)*(d*sec(f*x+e))^(5/3)*tan(f*x+e)/a/f/(sec(f*x+e)^2)^(5/6)
```

Rubi [A] time = 0.85, antiderivative size = 552, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.440, Rules used = {3512, 757, 429, 444, 63, 296, 634, 618, 204, 628, 208}

$$\frac{\tan(e+fx)(d\sec(e+fx))^{5/3}F_1\left(\frac{1}{2};1,\frac{1}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{af\sec^2(e+fx)^{5/6}}+\frac{(d\sec(e+fx))^{5/3}\log\left(-\sqrt[3]{b}\sqrt[6]{a^2+b^2}\right.}{4b^{2/3}f\sqrt[6]{a^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(5/3)/(a + b*Tan[e + f*x]),x]
```

```
[Out] -(Sqrt[3]*ArcTan[1/Sqrt[3] - (2*b^(1/3)*(Sec[e + f*x]^2)^(1/6))/(Sqrt[3]*(a
^2 + b^2)^(1/6))]*(d*Sec[e + f*x])^(5/3))/(2*b^(2/3)*(a^2 + b^2)^(1/6)*f*(S
ec[e + f*x]^2)^(5/6)) + (Sqrt[3]*ArcTan[1/Sqrt[3] + (2*b^(1/3)*(Sec[e + f*x
]^2)^(1/6))/(Sqrt[3]*(a^2 + b^2)^(1/6))]*(d*Sec[e + f*x])^(5/3))/(2*b^(2/3)
*(a^2 + b^2)^(1/6)*f*(Sec[e + f*x]^2)^(5/6)) - (ArcTanh[(b^(1/3)*(Sec[e + f
*x]^2)^(1/6))/(a^2 + b^2)^(1/6)]*(d*Sec[e + f*x])^(5/3))/(b^(2/3)*(a^2 + b^
2)^(1/6)*f*(Sec[e + f*x]^2)^(5/6)) + (Log[(a^2 + b^2)^(1/3) - b^(1/3)*(a^2
+ b^2)^(1/6)*(Sec[e + f*x]^2)^(1/6) + b^(2/3)*(Sec[e + f*x]^2)^(1/3)]*(d*Se
c[e + f*x])^(5/3))/(4*b^(2/3)*(a^2 + b^2)^(1/6)*f*(Sec[e + f*x]^2)^(5/6)) -
 (Log[(a^2 + b^2)^(1/3) + b^(1/3)*(a^2 + b^2)^(1/6)*(Sec[e + f*x]^2)^(1/6)
+ b^(2/3)*(Sec[e + f*x]^2)^(1/3)]*(d*Sec[e + f*x])^(5/3))/(4*b^(2/3)*(a^2 +
 b^2)^(1/6)*f*(Sec[e + f*x]^2)^(5/6)) + (AppellF1[1/2, 1, 1/6, 3/2, (b^2*Ta
n[e + f*x]^2)/a^2, -Tan[e + f*x]^2]*(d*Sec[e + f*x])^(5/3)*Tan[e + f*x])/(a
*f*(Sec[e + f*x]^2)^(5/6))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
```

```
a, 0] || LtQ[b, 0])
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 296

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Module[{r = Numerator
[Rt[-(a/b), n]], s = Denominator[Rt[-(a/b), n]], k, u}, Simp[u = Int[(r*Cos
[(2*k*m*Pi)/n] - s*Cos[(2*k*(m + 1)*Pi)/n]*x)/(r^2 - 2*r*s*Cos[(2*k*Pi)/n]*
x + s^2*x^2), x] + Int[(r*Cos[(2*k*m*Pi)/n] + s*Cos[(2*k*(m + 1)*Pi)/n]*x)/
(r^2 + 2*r*s*Cos[(2*k*Pi)/n]*x + s^2*x^2), x]; (2*r^(m + 2)*Int[1/(r^2 - s^
2*x^2), x])/(a*n*s^m) + Dist[(2*r^(m + 1))/(a*n*s^m), Sum[u, {k, 1, (n - 2)
/4}], x], x]] /; FreeQ[{a, b}, x] && IGtQ[(n - 2)/4, 0] && IGtQ[m, 0] && Lt
Q[m, n - 1] && NegQ[a/b]
```

Rule 429

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[a^p*c^q*x*AppellF1[1/n, -p, -q, 1 + 1/n, -((b*x^n)/a), -((d*x^n)/c)
], x] /; FreeQ[{a, b, c, d, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[n, -1]
 && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 757

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Int[E
xpandIntegrand[(a + c*x^2)^p, (d/(d^2 - e^2*x^2) - (e*x)/(d^2 - e^2*x^2))^(
-m), x], x] /; FreeQ[{a, c, d, e, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !Inte
gerQ[p] && ILtQ[m, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] && !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{(d\sec(e+fx))^{5/3}}{a+b\tan(e+fx)}\,dx = \frac{(d\sec(e+fx))^{5/3}\,\text{Subst}\left(\int \frac{1}{(a+x)\sqrt[6]{1+\frac{x^2}{b^2}}}\,dx, x, b\tan(e+fx)\right)}{bf\sec^2(e+fx)^{5/6}}$$

$$= \frac{(d\sec(e+fx))^{5/3}\,\text{Subst}\left(\int \left(\frac{a}{(a^2-x^2)\sqrt[6]{1+\frac{x^2}{b^2}}}+\frac{x}{(-a^2+x^2)\sqrt[6]{1+\frac{x^2}{b^2}}}\right)dx, x, b\tan(e+fx)\right)}{bf\sec^2(e+fx)^{5/6}}$$

$$= \frac{(d\sec(e+fx))^{5/3}\,\text{Subst}\left(\int \frac{x}{(-a^2+x^2)\sqrt[6]{1+\frac{x^2}{b^2}}}\,dx, x, b\tan(e+fx)\right)}{bf\sec^2(e+fx)^{5/6}} + \frac{\left(a(d\sec(e+fx))^{5}\right.}{}$$

$$= \frac{F_1\left(\frac{1}{2};1,\frac{1}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)(d\sec(e+fx))^{5/3}\tan(e+fx)}{af\sec^2(e+fx)^{5/6}} + \frac{(d\sec(e+}{}$$

$$= \frac{F_1\left(\frac{1}{2};1,\frac{1}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)(d\sec(e+fx))^{5/3}\tan(e+fx)}{af\sec^2(e+fx)^{5/6}} + \frac{\left(3b(d\sec\right.}{}$$

$$= \frac{F_1\left(\frac{1}{2};1,\frac{1}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)(d\sec(e+fx))^{5/3}\tan(e+fx)}{af\sec^2(e+fx)^{5/6}} - \frac{(d\sec(e+}{}$$

$$= -\frac{\tanh^{-1}\left(\frac{\sqrt[3]{b}\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}\right)(d\sec(e+fx))^{5/3}}{b^{2/3}\sqrt[6]{a^2+b^2}\,f\sec^2(e+fx)^{5/6}} + \frac{F_1\left(\frac{1}{2};1,\frac{1}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+\right.}{af\sec^2(e+}$$

$$= -\frac{\tanh^{-1}\left(\frac{\sqrt[3]{b}\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}\right)(d\sec(e+fx))^{5/3}}{b^{2/3}\sqrt[6]{a^2+b^2}\,f\sec^2(e+fx)^{5/6}} + \frac{\log\left(\sqrt[3]{a^2+b^2}-\sqrt[3]{b}\sqrt[6]{a^2+b^2}\sqrt[6]{\sec^2(\right.}{4b^{2/3}\sqrt[6]{a^2-}}$$

$$= -\frac{\sqrt{3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}}{\sqrt{3}}\right)(d\sec(e+fx))^{5/3}}{2b^{2/3}\sqrt[6]{a^2+b^2}\,f\sec^2(e+fx)^{5/6}} + \frac{\sqrt{3}\tan^{-1}\left(\frac{1+\frac{2\sqrt[3]{b}\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}}{\sqrt{3}}\right)(d\sec}{2b^{2/3}\sqrt[6]{a^2+b^2}\,f\sec^2(e+f}$$

Mathematica [C] time = 6.04, size = 276, normalized size = 0.50

$$-\frac{24d^2(a+b\tan(e+fx))F_1\left(\frac{1}{3};\frac{1}{6},\frac{1}{6};\frac{4}{3};\frac{a-ib}{a+b\tan(e+fx)},\right.}{bf\sqrt[3]{d\sec(e+fx)}\left((a+ib)F_1\left(\frac{4}{3};\frac{1}{6},\frac{7}{6};\frac{7}{3};\frac{a-ib}{a+b\tan(e+fx)},\frac{a+ib}{a+b\tan(e+fx)}\right)+(a-ib)F_1\left(\frac{4}{3};\frac{7}{6},\frac{1}{6};\frac{7}{3};\frac{a-ib}{a+b\tan(e+fx)},\frac{a+}{a+b\tan}\right.\right.}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Sec[e + f*x])^(5/3)/(a + b*Tan[e + f*x]),x]
```

```
[Out] (-24*d^2*AppellF1[1/3, 1/6, 1/6, 4/3, (a - I*b)/(a + b*Tan[e + f*x]), (a +
I*b)/(a + b*Tan[e + f*x])]*(a + b*Tan[e + f*x]))/(b*f*(d*Sec[e + f*x])^(1/3
)*((a + I*b)*AppellF1[4/3, 1/6, 7/6, 7/3, (a - I*b)/(a + b*Tan[e + f*x]), (
a + I*b)/(a + b*Tan[e + f*x])] + (a - I*b)*AppellF1[4/3, 7/6, 1/6, 7/3, (a
- I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])] + 8*AppellF1[1
/3, 1/6, 1/6, 4/3, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e +
 f*x])]*(a + b*Tan[e + f*x])))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)/(a+b*tan(f*x+e)),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(fx+e\right)\right)^{\frac{5}{3}}}{b \tan\left(fx+e\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)/(a+b*tan(f*x+e)),x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(5/3)/(b*tan(f*x + e) + a), x)
```

maple [F] time = 1.11, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(fx+e\right)\right)^{\frac{5}{3}}}{a+b \tan\left(fx+e\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(5/3)/(a+b*tan(f*x+e)),x)
```

```
[Out] int((d*sec(f*x+e))^(5/3)/(a+b*tan(f*x+e)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(fx+e\right)\right)^{\frac{5}{3}}}{b \tan\left(fx+e\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)/(a+b*tan(f*x+e)),x, algorithm="maxima")
```

```
[Out] integrate((d*sec(f*x + e))^(5/3)/(b*tan(f*x + e) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{5/3}}{a+b\,\tan\left(e+f\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(5/3)/(a + b*tan(e + f*x)),x)
```

```
[Out] int((d/cos(e + f*x))^(5/3)/(a + b*tan(e + f*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(e+fx\right)\right)^{\frac{5}{3}}}{a+b\tan\left(e+fx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(5/3)/(a+b*tan(f*x+e)),x)
```

```
[Out] Integral((d*sec(e + f*x))**(5/3)/(a + b*tan(e + f*x)), x)
```

3.633 $\int \frac{\sqrt[3]{d\sec(e+fx)}}{a+b\tan(e+fx)}\,dx$

Optimal. Leaf size=552

$$\frac{\tan(e+fx)\sqrt[3]{d\sec(e+fx)}\,F_1\left(\frac{1}{2};1,\frac{5}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{af\sqrt[6]{\sec^2(e+fx)}}+\frac{b^{2/3}\sqrt[3]{d\sec(e+fx)}\,\log\left(-\sqrt[3]{b}\,\sqrt[6]{a^2+b^2}\,\sqrt[6]{\mathrm{se}}\right.}{4f\left(a^2+b^2\right)^{5}}$$

```
[Out] -b^(2/3)*arctanh(b^(1/3)*(sec(f*x+e)^2)^(1/6)/(a^2+b^2)^(1/6))*(d*sec(f*x+e
))^(1/3)/(a^2+b^2)^(5/6)/f/(sec(f*x+e)^2)^(1/6)+1/4*b^(2/3)*ln((a^2+b^2)^(1
/3)-b^(1/3)*(a^2+b^2)^(1/6)*(sec(f*x+e)^2)^(1/6)+b^(2/3)*(sec(f*x+e)^2)^(1/
3))*(d*sec(f*x+e))^(1/3)/(a^2+b^2)^(5/6)/f/(sec(f*x+e)^2)^(1/6)-1/4*b^(2/3)
*ln((a^2+b^2)^(1/3)+b^(1/3)*(a^2+b^2)^(1/6)*(sec(f*x+e)^2)^(1/6)+b^(2/3)*(s
ec(f*x+e)^2)^(1/3))*(d*sec(f*x+e))^(1/3)/(a^2+b^2)^(5/6)/f/(sec(f*x+e)^2)^(
1/6)-1/2*b^(2/3)*arctan(-1/3*3^(1/2)+2/3*b^(1/3)*(sec(f*x+e)^2)^(1/6)/(a^2+
b^2)^(1/6)*3^(1/2))*(d*sec(f*x+e))^(1/3)*3^(1/2)/(a^2+b^2)^(5/6)/f/(sec(f*x
+e)^2)^(1/6)-1/2*b^(2/3)*arctan(1/3*3^(1/2)+2/3*b^(1/3)*(sec(f*x+e)^2)^(1/6
)/(a^2+b^2)^(1/6)*3^(1/2))*(d*sec(f*x+e))^(1/3)*3^(1/2)/(a^2+b^2)^(5/6)/f/(
sec(f*x+e)^2)^(1/6)+AppellF1(1/2,1,5/6,3/2,b^2*tan(f*x+e)^2/a^2,-tan(f*x+e)
^2)*(d*sec(f*x+e))^(1/3)*tan(f*x+e)/a/f/(sec(f*x+e)^2)^(1/6)
```

Rubi [A] time = 0.77, antiderivative size = 552, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.440, Rules used = {3512, 757, 429, 444, 63, 210, 634, 618, 204, 628, 208}

$$\frac{\tan(e+fx)\sqrt[3]{d\sec(e+fx)}\,F_1\left(\frac{1}{2};1,\frac{5}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{af\sqrt[6]{\sec^2(e+fx)}}+\frac{b^{2/3}\sqrt[3]{d\sec(e+fx)}\,\log\left(-\sqrt[3]{b}\,\sqrt[6]{a^2+b^2}\,\sqrt[6]{\mathrm{se}}\right.}{4f\left(a^2+b^2\right)^{5}}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(1/3)/(a + b*Tan[e + f*x]),x]
```

```
[Out] (Sqrt[3]*b^(2/3)*ArcTan[1/Sqrt[3] - (2*b^(1/3)*(Sec[e + f*x]^2)^(1/6))/(Sqr
t[3]*(a^2 + b^2)^(1/6))]*(d*Sec[e + f*x])^(1/3))/(2*(a^2 + b^2)^(5/6)*f*(Se
c[e + f*x]^2)^(1/6)) - (Sqrt[3]*b^(2/3)*ArcTan[1/Sqrt[3] + (2*b^(1/3)*(Sec[
e + f*x]^2)^(1/6))/(Sqrt[3]*(a^2 + b^2)^(1/6))]*(d*Sec[e + f*x])^(1/3))/(2*
(a^2 + b^2)^(5/6)*f*(Sec[e + f*x]^2)^(1/6)) - (b^(2/3)*ArcTanh[(b^(1/3)*(Se
c[e + f*x]^2)^(1/6))/(a^2 + b^2)^(1/6)]*(d*Sec[e + f*x])^(1/3))/((a^2 + b^2
)^(5/6)*f*(Sec[e + f*x]^2)^(1/6)) + (b^(2/3)*Log[(a^2 + b^2)^(1/3) - b^(1/3
)*(a^2 + b^2)^(1/6)*(Sec[e + f*x]^2)^(1/6) + b^(2/3)*(Sec[e + f*x]^2)^(1/3)
]*(d*Sec[e + f*x])^(1/3))/(4*(a^2 + b^2)^(5/6)*f*(Sec[e + f*x]^2)^(1/6)) -
(b^(2/3)*Log[(a^2 + b^2)^(1/3) + b^(1/3)*(a^2 + b^2)^(1/6)*(Sec[e + f*x]^2)
^(1/6) + b^(2/3)*(Sec[e + f*x]^2)^(1/3)]*(d*Sec[e + f*x])^(1/3))/(4*(a^2 +
b^2)^(5/6)*f*(Sec[e + f*x]^2)^(1/6)) + (AppellF1[1/2, 1, 5/6, 3/2, (b^2*Tan
[e + f*x]^2)/a^2, -Tan[e + f*x]^2]*(d*Sec[e + f*x])^(1/3)*Tan[e + f*x])/(a*
f*(Sec[e + f*x]^2)^(1/6))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^(n_))^(-1), x_Symbol] :> Module[{r = Numerator[Rt[-(
a/b), n]], s = Denominator[Rt[-(a/b), n]], k, u}, Simp[u = Int[(r - s*Cos[(
2*k*Pi)/n]*x)/(r^2 - 2*r*s*Cos[(2*k*Pi)/n]*x + s^2*x^2), x] + Int[(r + s*Co
s[(2*k*Pi)/n]*x)/(r^2 + 2*r*s*Cos[(2*k*Pi)/n]*x + s^2*x^2), x]; (2*r^2*Int[
1/(r^2 - s^2*x^2), x])/(a*n) + Dist[(2*r)/(a*n), Sum[u, {k, 1, (n - 2)/4}],
 x], x]] /; FreeQ[{a, b}, x] && IGtQ[(n - 2)/4, 0] && NegQ[a/b]
```

Rule 429

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[a^p*c^q*x*AppellF1[1/n, -p, -q, 1 + 1/n, -((b*x^n)/a), -((d*x^n)/c)
], x] /; FreeQ[{a, b, c, d, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[n, -1]
 && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 757

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Int[E
xpandIntegrand[(a + c*x^2)^p, (d/(d^2 - e^2*x^2) - (e*x)/(d^2 - e^2*x^2))^(
-m), x], x] /; FreeQ[{a, c, d, e, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !Inte
gerQ[p] && ILtQ[m, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] && !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\sqrt[3]{d\sec(e+fx)}}{a+b\tan(e+fx)}\,dx = \frac{\sqrt[3]{d\sec(e+fx)}\ \text{Subst}\left(\int \frac{1}{(a+x)\left(1+\frac{x^2}{b^2}\right)^{5/6}}\,dx, x, b\tan(e+fx)\right)}{bf\sqrt[6]{\sec^2(e+fx)}}$$

$$= \frac{\sqrt[3]{d\sec(e+fx)}\ \text{Subst}\left(\int \left(\frac{a}{(a^2-x^2)\left(1+\frac{x^2}{b^2}\right)^{5/6}} + \frac{x}{(-a^2+x^2)\left(1+\frac{x^2}{b^2}\right)^{5/6}}\right) dx, x, b\tan(e+fx)\right)}{bf\sqrt[6]{\sec^2(e+fx)}}$$

$$= \frac{\sqrt[3]{d\sec(e+fx)}\ \text{Subst}\left(\int \frac{x}{(-a^2+x^2)\left(1+\frac{x^2}{b^2}\right)^{5/6}}\,dx, x, b\tan(e+fx)\right)}{bf\sqrt[6]{\sec^2(e+fx)}} + \frac{\left(a\sqrt[3]{d\sec(e+fx)}\right)\text{Su}}{}$$

$$= \frac{F_1\left(\frac{1}{2};1,\frac{5}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)\sqrt[3]{d\sec(e+fx)}\ \tan(e+fx)}{af\sqrt[6]{\sec^2(e+fx)}} + \frac{\sqrt[3]{d\sec(e+fx}}{}$$

$$= \frac{F_1\left(\frac{1}{2};1,\frac{5}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)\sqrt[3]{d\sec(e+fx)}\ \tan(e+fx)}{af\sqrt[6]{\sec^2(e+fx)}} + \frac{\left(3b\sqrt[3]{d\sec(e+}\right.}{}$$

$$= \frac{F_1\left(\frac{1}{2};1,\frac{5}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)\sqrt[3]{d\sec(e+fx)}\ \tan(e+fx)}{af\sqrt[6]{\sec^2(e+fx)}} - \frac{\left(b\sqrt[3]{d\sec(e+}\right.}{}$$

$$= -\frac{b^{2/3}\tanh^{-1}\left(\frac{\sqrt[3]{b}\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}\right)\sqrt[3]{d\sec(e+fx)}}{\left(a^2+b^2\right)^{5/6}f\sqrt[6]{\sec^2(e+fx)}} + \frac{F_1\left(\frac{1}{2};1,\frac{5}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+f\right.}{af\sqrt[6]{\sec^2(e+}}$$

$$= -\frac{b^{2/3}\tanh^{-1}\left(\frac{\sqrt[3]{b}\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}\right)\sqrt[3]{d\sec(e+fx)}}{\left(a^2+b^2\right)^{5/6}f\sqrt[6]{\sec^2(e+fx)}} + \frac{b^{2/3}\log\left(\sqrt[3]{a^2+b^2}-\sqrt[3]{b}\sqrt[6]{a^2+b^2}\sqrt[6]{\text{se}}\right.}{4\left(a^2+b^2\right.}$$

$$= \frac{\sqrt{3}\,b^{2/3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}}{\sqrt{3}}\right)\sqrt[3]{d\sec(e+fx)}}{2\left(a^2+b^2\right)^{5/6}f\sqrt[6]{\sec^2(e+fx)}} - \frac{\sqrt{3}\,b^{2/3}\tan^{-1}\left(\frac{1+\frac{2\sqrt[3]{b}\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}}{\sqrt{3}}\right)\sqrt[3]{d\,\text{se}}}{2\left(a^2+b^2\right)^{5/6}f\sqrt[6]{\sec^2(e+f}}$$

Mathematica [C] time = 4.58, size = 280, normalized size = 0.51

$$-\frac{48d^2(a+b\tan(e+fx))F_1\left(\frac{5}{3};\frac{5}{6},\frac{5}{6};\frac{8}{3};\frac{a-ib}{a+b\tan(e+fx)}\right.}{5bf(d\sec(e+fx))^{5/3}\left(5(a+ib)F_1\left(\frac{8}{3};\frac{5}{6},\frac{11}{6};\frac{11}{3};\frac{a-ib}{a+b\tan(e+fx)},\frac{a+ib}{a+b\tan(e+fx)}\right)+5(a-ib)F_1\left(\frac{8}{3};\frac{11}{6},\frac{5}{6};\frac{11}{3};\frac{a-ib}{a+b\tan(e+fx)},\right.\right.}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Sec[e + f*x])^(1/3)/(a + b*Tan[e + f*x]),x]
```

```
[Out] (-48*d^2*AppellF1[5/3, 5/6, 5/6, 8/3, (a - I*b)/(a + b*Tan[e + f*x]), (a +
I*b)/(a + b*Tan[e + f*x])]*(a + b*Tan[e + f*x]))/(5*b*f*(d*Sec[e + f*x])^(5
/3)*(5*(a + I*b)*AppellF1[8/3, 5/6, 11/6, 11/3, (a - I*b)/(a + b*Tan[e + f*
x]), (a + I*b)/(a + b*Tan[e + f*x])] + 5*(a - I*b)*AppellF1[8/3, 11/6, 5/6,
 11/3, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])] + 16
*AppellF1[5/3, 5/6, 5/6, 8/3, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a
+ b*Tan[e + f*x])]*(a + b*Tan[e + f*x])))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)/(a+b*tan(f*x+e)),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(fx+e\right)\right)^{\frac{1}{3}}}{b \tan\left(fx+e\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)/(a+b*tan(f*x+e)),x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(1/3)/(b*tan(f*x + e) + a), x)
```

maple [F] time = 1.10, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(fx+e\right)\right)^{\frac{1}{3}}}{a+b \tan\left(fx+e\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(1/3)/(a+b*tan(f*x+e)),x)
```

```
[Out] int((d*sec(f*x+e))^(1/3)/(a+b*tan(f*x+e)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(fx+e\right)\right)^{\frac{1}{3}}}{b \tan\left(fx+e\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)/(a+b*tan(f*x+e)),x, algorithm="maxima")
```

```
[Out] integrate((d*sec(f*x + e))^(1/3)/(b*tan(f*x + e) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{1/3}}{a+b\,\tan\left(e+f\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(1/3)/(a + b*tan(e + f*x)),x)
```

```
[Out] int((d/cos(e + f*x))^(1/3)/(a + b*tan(e + f*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt[3]{d \sec \left(e + f x\right)}}{a + b \tan \left(e + f x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(1/3)/(a+b*tan(f*x+e)),x)
```

```
[Out] Integral((d*sec(e + f*x))**(1/3)/(a + b*tan(e + f*x)), x)
```

3.634 $\int \frac{1}{\sqrt[3]{d \sec(e+fx)}\,(a+b\tan(e+fx))}\,dx$

Optimal. Leaf size=579

$$\frac{\tan(e+fx)\sqrt[6]{\sec^2(e+fx)}\,F_1\left(\frac{1}{2};1,\frac{7}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{af\sqrt[3]{d\sec(e+fx)}}+\frac{3b}{f\left(a^2+b^2\right)\sqrt[3]{d\sec(e+fx)}}+\frac{b^{4/3}\sqrt[6]{\sec^2(}}{}$$

```
[Out] 3*b/(a^2+b^2)/f/(d*sec(f*x+e))^(1/3)-b^(4/3)*arctanh(b^(1/3)*(sec(f*x+e)^2)
^(1/6)/(a^2+b^2)^(1/6))*(sec(f*x+e)^2)^(1/6)/(a^2+b^2)^(7/6)/f/(d*sec(f*x+e
))^(1/3)+1/4*b^(4/3)*ln((a^2+b^2)^(1/3)-b^(1/3)*(a^2+b^2)^(1/6)*(sec(f*x+e)
^2)^(1/6)+b^(2/3)*(sec(f*x+e)^2)^(1/3))*(sec(f*x+e)^2)^(1/6)/(a^2+b^2)^(7/6
)/f/(d*sec(f*x+e))^(1/3)-1/4*b^(4/3)*ln((a^2+b^2)^(1/3)+b^(1/3)*(a^2+b^2)^(
1/6)*(sec(f*x+e)^2)^(1/6)+b^(2/3)*(sec(f*x+e)^2)^(1/3))*(sec(f*x+e)^2)^(1/6
)/(a^2+b^2)^(7/6)/f/(d*sec(f*x+e))^(1/3)+1/2*b^(4/3)*arctan(-1/3*3^(1/2)+2/
3*b^(1/3)*(sec(f*x+e)^2)^(1/6)/(a^2+b^2)^(1/6)*3^(1/2))*(sec(f*x+e)^2)^(1/6
)*3^(1/2)/(a^2+b^2)^(7/6)/f/(d*sec(f*x+e))^(1/3)+1/2*b^(4/3)*arctan(1/3*3^(
1/2)+2/3*b^(1/3)*(sec(f*x+e)^2)^(1/6)/(a^2+b^2)^(1/6)*3^(1/2))*(sec(f*x+e)^
2)^(1/6)*3^(1/2)/(a^2+b^2)^(7/6)/f/(d*sec(f*x+e))^(1/3)+AppellF1(1/2,1,7/6,
3/2,b^2*tan(f*x+e)^2/a^2,-tan(f*x+e)^2)*(sec(f*x+e)^2)^(1/6)*tan(f*x+e)/a/f
/(d*sec(f*x+e))^(1/3)
```

Rubi [A] time = 0.85, antiderivative size = 579, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {3512, 757, 429, 444, 51, 63, 296, 634, 618, 204, 628, 208}

$$\frac{\tan(e+fx)\sqrt[6]{\sec^2(e+fx)}\,F_1\left(\frac{1}{2};1,\frac{7}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{af\sqrt[3]{d\sec(e+fx)}}+\frac{3b}{f\left(a^2+b^2\right)\sqrt[3]{d\sec(e+fx)}}+\frac{b^{4/3}\sqrt[6]{\sec^2(}}{}$$

Antiderivative was successfully verified.

```
[In] Int[1/((d*Sec[e + f*x])^(1/3)*(a + b*Tan[e + f*x])),x]
```

```
[Out] (3*b)/((a^2 + b^2)*f*(d*Sec[e + f*x])^(1/3)) - (Sqrt[3]*b^(4/3)*ArcTan[1/Sq
rt[3] - (2*b^(1/3)*(Sec[e + f*x]^2)^(1/6))/(Sqrt[3]*(a^2 + b^2)^(1/6))]*(Se
c[e + f*x]^2)^(1/6))/(2*(a^2 + b^2)^(7/6)*f*(d*Sec[e + f*x])^(1/3)) + (Sqrt
[3]*b^(4/3)*ArcTan[1/Sqrt[3] + (2*b^(1/3)*(Sec[e + f*x]^2)^(1/6))/(Sqrt[3]*
(a^2 + b^2)^(1/6))]*(Sec[e + f*x]^2)^(1/6))/(2*(a^2 + b^2)^(7/6)*f*(d*Sec[e
 + f*x])^(1/3)) - (b^(4/3)*ArcTanh[(b^(1/3)*(Sec[e + f*x]^2)^(1/6))/(a^2 +
b^2)^(1/6)]*(Sec[e + f*x]^2)^(1/6))/((a^2 + b^2)^(7/6)*f*(d*Sec[e + f*x])^(
1/3)) + (b^(4/3)*Log[(a^2 + b^2)^(1/3) - b^(1/3)*(a^2 + b^2)^(1/6)*(Sec[e +
 f*x]^2)^(1/6) + b^(2/3)*(Sec[e + f*x]^2)^(1/3)]*(Sec[e + f*x]^2)^(1/6))/(4
*(a^2 + b^2)^(7/6)*f*(d*Sec[e + f*x])^(1/3)) - (b^(4/3)*Log[(a^2 + b^2)^(1/
3) + b^(1/3)*(a^2 + b^2)^(1/6)*(Sec[e + f*x]^2)^(1/6) + b^(2/3)*(Sec[e + f*
x]^2)^(1/3)]*(Sec[e + f*x]^2)^(1/6))/(4*(a^2 + b^2)^(7/6)*f*(d*Sec[e + f*x]
)^(1/3)) + (AppellF1[1/2, 1, 7/6, 3/2, (b^2*Tan[e + f*x]^2)/a^2, -Tan[e + f
*x]^2]*(Sec[e + f*x]^2)^(1/6)*Tan[e + f*x])/(a*f*(d*Sec[e + f*x])^(1/3))
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 296

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Module[{r = Numerator
[Rt[-(a/b), n]], s = Denominator[Rt[-(a/b), n]], k, u}, Simp[u = Int[(r*Cos
[(2*k*m*Pi)/n] - s*Cos[(2*k*(m + 1)*Pi)/n]*x)/(r^2 - 2*r*s*Cos[(2*k*Pi)/n]*
x + s^2*x^2), x] + Int[(r*Cos[(2*k*m*Pi)/n] + s*Cos[(2*k*(m + 1)*Pi)/n]*x)/
(r^2 + 2*r*s*Cos[(2*k*Pi)/n]*x + s^2*x^2), x]; (2*r^(m + 2)*Int[1/(r^2 - s^
2*x^2), x])/(a*n*s^m) + Dist[(2*r^(m + 1))/(a*n*s^m), Sum[u, {k, 1, (n - 2)
/4}], x], x]] /; FreeQ[{a, b}, x] && IGtQ[(n - 2)/4, 0] && IGtQ[m, 0] && Lt
Q[m, n - 1] && NegQ[a/b]
```

Rule 429

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[a^p*c^q*x*AppellF1[1/n, -p, -q, 1 + 1/n, -((b*x^n)/a), -((d*x^n)/c)
], x] /; FreeQ[{a, b, c, d, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[n, -1]
 && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
```

```
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 757

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Int[E
xpandIntegrand[(a + c*x^2)^p, (d/(d^2 - e^2*x^2) - (e*x)/(d^2 - e^2*x^2))^(
-m), x], x] /; FreeQ[{a, c, d, e, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !Inte
gerQ[p] && ILtQ[m, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{1}{\sqrt[3]{d\sec(e+fx)}\,(a+b\tan(e+fx))}\,dx = \frac{\sqrt[6]{\sec^2(e+fx)}\ \text{Subst}\left(\int \frac{1}{(a+x)\left(1+\frac{x^2}{b^2}\right)^{7/6}}\,dx, x, b\tan(e+fx)\right)}{bf\sqrt[3]{d\sec(e+fx)}}$$

$$= \frac{\sqrt[6]{\sec^2(e+fx)}\ \text{Subst}\left(\int \left(\frac{a}{(a^2-x^2)\left(1+\frac{x^2}{b^2}\right)^{7/6}} + \frac{x}{(-a^2+x^2)\left(1+\frac{x^2}{b^2}\right)^{7/6}}\right) dx, x, b\,\mathrm{t}\right.}{bf\sqrt[3]{d\sec(e+fx)}}$$

$$= \frac{\sqrt[6]{\sec^2(e+fx)}\ \text{Subst}\left(\int \frac{x}{(-a^2+x^2)\left(1+\frac{x^2}{b^2}\right)^{7/6}}\,dx, x, b\tan(e+fx)\right)}{bf\sqrt[3]{d\sec(e+fx)}} + \frac{\left(a\sqrt[6]{\mathrm{s}}\right.}{}$$

$$= \frac{F_1\left(\frac{1}{2};1,\frac{7}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)\sqrt[6]{\sec^2(e+fx)}\ \tan(e+fx)}{af\sqrt[3]{d\sec(e+fx)}}$$

$$= \frac{3b}{(a^2+b^2)\,f\sqrt[3]{d\sec(e+fx)}} + \frac{F_1\left(\frac{1}{2};1,\frac{7}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx\right.}{af\sqrt[3]{d\sec(e+}}$$

$$= \frac{3b}{(a^2+b^2)\,f\sqrt[3]{d\sec(e+fx)}} + \frac{F_1\left(\frac{1}{2};1,\frac{7}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx\right.}{af\sqrt[3]{d\sec(e+}}$$

$$= \frac{3b}{(a^2+b^2)\,f\sqrt[3]{d\sec(e+fx)}} + \frac{F_1\left(\frac{1}{2};1,\frac{7}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx\right.}{af\sqrt[3]{d\sec(e+}}$$

$$= \frac{3b}{(a^2+b^2)\,f\sqrt[3]{d\sec(e+fx)}} - \frac{b^{4/3}\tanh^{-1}\left(\frac{\sqrt[3]{b}\ \sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}\right)\sqrt[6]{\sec^2(e+}}{(a^2+b^2)^{7/6}\,f\sqrt[3]{d\sec(e+fx)}}$$

$$= \frac{3b}{(a^2+b^2)\,f\sqrt[3]{d\sec(e+fx)}} - \frac{b^{4/3}\tanh^{-1}\left(\frac{\sqrt[3]{b}\ \sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}\right)\sqrt[6]{\sec^2(e+}}{(a^2+b^2)^{7/6}\,f\sqrt[3]{d\sec(e+fx)}}$$

$$= \frac{3b}{(a^2+b^2)\,f\sqrt[3]{d\sec(e+fx)}} - \frac{\sqrt{3}\,b^{4/3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}\ \sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}}{\sqrt{3}}\right)\sqrt[6]{\sec^2(e}}{2\,(a^2+b^2)^{7/6}\,f\sqrt[3]{d\sec(e+fx)}}$$

Mathematica [C] time = 21.64, size = 285, normalized size = 0.49

$$-\frac{60dF_1\left(\frac{7}{3};\frac{7}{6},\frac{7}{6};\frac{10}{3};\frac{a-ib}{a+b\tan(e+fx)},\frac{a+ib}{a+b\tan(e+fx)}\right)(a\cos(e+}{7bf(d\sec(e+fx))^{4/3}\left(7(a+ib)F_1\left(\frac{10}{3};\frac{7}{6},\frac{13}{6};\frac{13}{3};\frac{a-ib}{a+b\tan(e+fx)},\frac{a+ib}{a+b\tan(e+fx)}\right)+7(a-ib)F_1\left(\frac{10}{3};\frac{13}{6},\frac{7}{6};\frac{13}{3};\frac{a-ib}{a+b\tan(e+fx}\right.\right.}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/((d*Sec[e + f*x])^(1/3)*(a + b*Tan[e + f*x])),x]
```

```
[Out] (-60*d*AppellF1[7/3, 7/6, 7/6, 10/3, (a - I*b)/(a + b*Tan[e + f*x]), (a + I
*b)/(a + b*Tan[e + f*x])]*(a*Cos[e + f*x] + b*Sin[e + f*x]))/(7*b*f*(d*Sec[
e + f*x])^(4/3)*(7*(a + I*b)*AppellF1[10/3, 7/6, 13/6, 13/3, (a - I*b)/(a +
 b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])] + 7*(a - I*b)*AppellF1[10
/3, 13/6, 7/6, 13/3, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e
 + f*x])] + 20*AppellF1[7/3, 7/6, 7/6, 10/3, (a - I*b)/(a + b*Tan[e + f*x])
, (a + I*b)/(a + b*Tan[e + f*x])]*(a + b*Tan[e + f*x])))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(1/3)/(a+b*tan(f*x+e)),x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d \sec \left(f x+e\right)\right)^{\frac{1}{3}} \left(b \tan \left(f x+e\right)+a\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(1/3)/(a+b*tan(f*x+e)),x, algorithm="giac")
```

```
[Out] integrate(1/((d*sec(f*x + e))^(1/3)*(b*tan(f*x + e) + a)), x)
```

maple [F] time = 1.08, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d \sec \left(f x+e\right)\right)^{\frac{1}{3}} \left(a+b \tan \left(f x+e\right)\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*sec(f*x+e))^(1/3)/(a+b*tan(f*x+e)),x)
```

```
[Out] int(1/(d*sec(f*x+e))^(1/3)/(a+b*tan(f*x+e)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d \sec \left(f x+e\right)\right)^{\frac{1}{3}} \left(b \tan \left(f x+e\right)+a\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(1/3)/(a+b*tan(f*x+e)),x, algorithm="maxima")
```

```
[Out] integrate(1/((d*sec(f*x + e))^(1/3)*(b*tan(f*x + e) + a)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{1/3}\,\left(a+b\,\tan\left(e+f\,x\right)\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d/cos(e + f*x))^(1/3)*(a + b*tan(e + f*x))),x)
```

```
[Out] int(1/((d/cos(e + f*x))^(1/3)*(a + b*tan(e + f*x))), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt[3]{d\sec\left(e+fx\right)}\left(a+b\tan\left(e+fx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))**(1/3)/(a+b*tan(f*x+e)),x)
[Out] Integral(1/((d*sec(e + f*x))**(1/3)*(a + b*tan(e + f*x))), x)
```

3.635 $\int \frac{1}{(d\sec(e+fx))^{5/3}(a+b\tan(e+fx))} dx$

Optimal. Leaf size=581

$$\frac{\tan(e+fx)\sec^2(e+fx)^{5/6}F_1\left(\frac{1}{2};1,\frac{11}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{af(d\sec(e+fx))^{5/3}}+\frac{3b}{5f\left(a^2+b^2\right)(d\sec(e+fx))^{5/3}}+\frac{b^{8/3}\sec}{}$$

```
[Out] 3/5*b/(a^2+b^2)/f/(d*sec(f*x+e))^(5/3)-b^(8/3)*arctanh(b^(1/3)*(sec(f*x+e)^
2)^(1/6)/(a^2+b^2)^(1/6))*(sec(f*x+e)^2)^(5/6)/(a^2+b^2)^(11/6)/f/(d*sec(f*
x+e))^(5/3)+1/4*b^(8/3)*ln((a^2+b^2)^(1/3)-b^(1/3)*(a^2+b^2)^(1/6)*(sec(f*x
+e)^2)^(1/6)+b^(2/3)*(sec(f*x+e)^2)^(1/3))*(sec(f*x+e)^2)^(5/6)/(a^2+b^2)^(
11/6)/f/(d*sec(f*x+e))^(5/3)-1/4*b^(8/3)*ln((a^2+b^2)^(1/3)+b^(1/3)*(a^2+b^
2)^(1/6)*(sec(f*x+e)^2)^(1/6)+b^(2/3)*(sec(f*x+e)^2)^(1/3))*(sec(f*x+e)^2)^
(5/6)/(a^2+b^2)^(11/6)/f/(d*sec(f*x+e))^(5/3)-1/2*b^(8/3)*arctan(-1/3*3^(1/
2)+2/3*b^(1/3)*(sec(f*x+e)^2)^(1/6)/(a^2+b^2)^(1/6)*3^(1/2))*(sec(f*x+e)^2)
^(5/6)*3^(1/2)/(a^2+b^2)^(11/6)/f/(d*sec(f*x+e))^(5/3)-1/2*b^(8/3)*arctan(1
/3*3^(1/2)+2/3*b^(1/3)*(sec(f*x+e)^2)^(1/6)/(a^2+b^2)^(1/6)*3^(1/2))*(sec(f
*x+e)^2)^(5/6)*3^(1/2)/(a^2+b^2)^(11/6)/f/(d*sec(f*x+e))^(5/3)+AppellF1(1/2
,1,11/6,3/2,b^2*tan(f*x+e)^2/a^2,-tan(f*x+e)^2)*(sec(f*x+e)^2)^(5/6)*tan(f*
x+e)/a/f/(d*sec(f*x+e))^(5/3)
```

Rubi [A] time = 0.82, antiderivative size = 581, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {3512, 757, 429, 444, 51, 63, 210, 634, 618, 204, 628, 208}

$$\frac{\tan(e+fx)\sec^2(e+fx)^{5/6}F_1\left(\frac{1}{2};1,\frac{11}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{af(d\sec(e+fx))^{5/3}}+\frac{3b}{5f\left(a^2+b^2\right)(d\sec(e+fx))^{5/3}}+\frac{b^{8/3}\sec}{}$$

Antiderivative was successfully verified.

```
[In] Int[1/((d*Sec[e + f*x])^(5/3)*(a + b*Tan[e + f*x])),x]
```

```
[Out] (3*b)/(5*(a^2 + b^2)*f*(d*Sec[e + f*x])^(5/3)) + (Sqrt[3]*b^(8/3)*ArcTan[1/
Sqrt[3] - (2*b^(1/3)*(Sec[e + f*x]^2)^(1/6))/(Sqrt[3]*(a^2 + b^2)^(1/6))]*(
Sec[e + f*x]^2)^(5/6))/(2*(a^2 + b^2)^(11/6)*f*(d*Sec[e + f*x])^(5/3)) - (S
qrt[3]*b^(8/3)*ArcTan[1/Sqrt[3] + (2*b^(1/3)*(Sec[e + f*x]^2)^(1/6))/(Sqrt[
3]*(a^2 + b^2)^(1/6))]*(Sec[e + f*x]^2)^(5/6))/(2*(a^2 + b^2)^(11/6)*f*(d*S
ec[e + f*x])^(5/3)) - (b^(8/3)*ArcTanh[(b^(1/3)*(Sec[e + f*x]^2)^(1/6))/(a^
2 + b^2)^(1/6)]*(Sec[e + f*x]^2)^(5/6))/((a^2 + b^2)^(11/6)*f*(d*Sec[e + f*
x])^(5/3)) + (b^(8/3)*Log[(a^2 + b^2)^(1/3) - b^(1/3)*(a^2 + b^2)^(1/6)*(Se
c[e + f*x]^2)^(1/6) + b^(2/3)*(Sec[e + f*x]^2)^(1/3)]*(Sec[e + f*x]^2)^(5/6
))/(4*(a^2 + b^2)^(11/6)*f*(d*Sec[e + f*x])^(5/3)) - (b^(8/3)*Log[(a^2 + b^
2)^(1/3) + b^(1/3)*(a^2 + b^2)^(1/6)*(Sec[e + f*x]^2)^(1/6) + b^(2/3)*(Sec[
e + f*x]^2)^(1/3)]*(Sec[e + f*x]^2)^(5/6))/(4*(a^2 + b^2)^(11/6)*f*(d*Sec[e
 + f*x])^(5/3)) + (AppellF1[1/2, 1, 11/6, 3/2, (b^2*Tan[e + f*x]^2)/a^2, -T
an[e + f*x]^2]*(Sec[e + f*x]^2)^(5/6)*Tan[e + f*x])/(a*f*(d*Sec[e + f*x])^(
5/3))
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
```

```
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^(n_))^(-1), x_Symbol] :> Module[{r = Numerator[Rt[-(
a/b), n]], s = Denominator[Rt[-(a/b), n]], k, u}, Simp[u = Int[(r - s*Cos[(
2*k*Pi)/n]*x)/(r^2 - 2*r*s*Cos[(2*k*Pi)/n]*x + s^2*x^2), x] + Int[(r + s*Co
s[(2*k*Pi)/n]*x)/(r^2 + 2*r*s*Cos[(2*k*Pi)/n]*x + s^2*x^2), x]; (2*r^2*Int[
1/(r^2 - s^2*x^2), x])/(a*n) + Dist[(2*r)/(a*n), Sum[u, {k, 1, (n - 2)/4}],
 x], x]] /; FreeQ[{a, b}, x] && IGtQ[(n - 2)/4, 0] && NegQ[a/b]
```

Rule 429

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[a^p*c^q*x*AppellF1[1/n, -p, -q, 1 + 1/n, -((b*x^n)/a), -((d*x^n)/c)
], x] /; FreeQ[{a, b, c, d, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[n, -1]
 && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 757

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Int[E
xpandIntegrand[(a + c*x^2)^p, (d/(d^2 - e^2*x^2) - (e*x)/(d^2 - e^2*x^2))^(
-m), x], x] /; FreeQ[{a, c, d, e, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !Inte
gerQ[p] && ILtQ[m, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{1}{(d\sec(e+fx))^{5/3}(a+b\tan(e+fx))}\,dx = \frac{\sec^2(e+fx)^{5/6}\,\text{Subst}\left(\int \frac{1}{(a+x)\left(1+\frac{x^2}{b^2}\right)^{11/6}}\,dx, x, b\tan(e+fx)\right)}{bf(d\sec(e+fx))^{5/3}}$$

$$= \frac{\sec^2(e+fx)^{5/6}\,\text{Subst}\left(\int \left(\frac{a}{(a^2-x^2)\left(1+\frac{x^2}{b^2}\right)^{11/6}} + \frac{x}{(-a^2+x^2)\left(1+\frac{x^2}{b^2}\right)^{11/6}}\right) dx, x,\right.}{bf(d\sec(e+fx))^{5/3}}$$

$$= \frac{\sec^2(e+fx)^{5/6}\,\text{Subst}\left(\int \frac{x}{(-a^2+x^2)\left(1+\frac{x^2}{b^2}\right)^{11/6}}\,dx, x, b\tan(e+fx)\right)}{bf(d\sec(e+fx))^{5/3}} + \frac{(a}{}$$

$$= \frac{F_1\left(\frac{1}{2};1,\frac{11}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)\sec^2(e+fx)^{5/6}\tan(e+f}{af(d\sec(e+fx))^{5/3}}$$

$$= \frac{3b}{5(a^2+b^2)f(d\sec(e+fx))^{5/3}} + \frac{F_1\left(\frac{1}{2};1,\frac{11}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e\right.}{af(d\sec(}$$

$$= \frac{3b}{5(a^2+b^2)f(d\sec(e+fx))^{5/3}} + \frac{F_1\left(\frac{1}{2};1,\frac{11}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e\right.}{af(d\sec(}$$

$$= \frac{3b}{5(a^2+b^2)f(d\sec(e+fx))^{5/3}} + \frac{F_1\left(\frac{1}{2};1,\frac{11}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e\right.}{af(d\sec(}$$

$$= \frac{3b}{5(a^2+b^2)f(d\sec(e+fx))^{5/3}} - \frac{b^{8/3}\tanh^{-1}\left(\frac{\sqrt[3]{b}\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}\right)\sec^2(e}{(a^2+b^2)^{11/6}f(d\sec(e+fx)}$$

$$= \frac{3b}{5(a^2+b^2)f(d\sec(e+fx))^{5/3}} - \frac{b^{8/3}\tanh^{-1}\left(\frac{\sqrt[3]{b}\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}\right)\sec^2(e}{(a^2+b^2)^{11/6}f(d\sec(e+fx)}$$

$$= \frac{3b}{5(a^2+b^2)f(d\sec(e+fx))^{5/3}} + \frac{\sqrt{3}\,b^{8/3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}}{\sqrt{3}}\right)\sec}{2(a^2+b^2)^{11/6}f(d\sec(e+f}$$

Mathematica [B] time = 32.12, size = 6862, normalized size = 11.81

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/((d*Sec[e + f*x])^(5/3)*(a + b*Tan[e + f*x])),x]
[Out] Result too large to show
```

fricas [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(5/3)/(a+b*tan(f*x+e)),x, algorithm="fricas")
[Out] Timed out
```

giac [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}\left(b\tan\left(fx+e\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(5/3)/(a+b*tan(f*x+e)),x, algorithm="giac")
[Out] integrate(1/((d*sec(f*x + e))^(5/3)*(b*tan(f*x + e) + a)), x)
```

maple [**F**] time = 1.07, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}\left(a+b\tan\left(fx+e\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*sec(f*x+e))^(5/3)/(a+b*tan(f*x+e)),x)
[Out] int(1/(d*sec(f*x+e))^(5/3)/(a+b*tan(f*x+e)),x)
```

maxima [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}\left(b\tan\left(fx+e\right)+a\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(5/3)/(a+b*tan(f*x+e)),x, algorithm="maxima")
[Out] integrate(1/((d*sec(f*x + e))^(5/3)*(b*tan(f*x + e) + a)), x)
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{5/3}\,\left(a+b\,\tan\left(e+f\,x\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d/cos(e + f*x))^(5/3)*(a + b*tan(e + f*x))),x)
[Out] int(1/((d/cos(e + f*x))^(5/3)*(a + b*tan(e + f*x))), x)
```

sympy [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(e+fx\right)\right)^{\frac{5}{3}}\left(a+b\tan\left(e+fx\right)\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))**(5/3)/(a+b*tan(f*x+e)),x)
[Out] Integral(1/((d*sec(e + f*x))**(5/3)*(a + b*tan(e + f*x))), x)
```

3.636 $\int \frac{(d\sec(e+fx))^{5/3}}{(a+b\tan(e+fx))^2}\,dx$

Optimal. Leaf size=687

$$\frac{\tan(e+fx)(d\sec(e+fx))^{5/3}F_1\left(\frac{1}{2};2,\frac{1}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{a^2f\sec^2(e+fx)^{5/6}}-\frac{ab(d\sec(e+fx))^{5/3}}{f\left(a^2+b^2\right)\left(a^2-b^2\tan^2(e+fx)\right)}+\frac{a(d\,\mathrm{se}}{}$$

```
[Out] -1/3*a*arctanh(b^(1/3)*(sec(f*x+e)^2)^(1/6)/(a^2+b^2)^(1/6))*(d*sec(f*x+e))
^(5/3)/b^(2/3)/(a^2+b^2)^(7/6)/f/(sec(f*x+e)^2)^(5/6)+1/12*a*ln((a^2+b^2)^(
1/3)-b^(1/3)*(a^2+b^2)^(1/6)*(sec(f*x+e)^2)^(1/6)+b^(2/3)*(sec(f*x+e)^2)^(1
/3))*(d*sec(f*x+e))^(5/3)/b^(2/3)/(a^2+b^2)^(7/6)/f/(sec(f*x+e)^2)^(5/6)-1/
12*a*ln((a^2+b^2)^(1/3)+b^(1/3)*(a^2+b^2)^(1/6)*(sec(f*x+e)^2)^(1/6)+b^(2/3
)*(sec(f*x+e)^2)^(1/3))*(d*sec(f*x+e))^(5/3)/b^(2/3)/(a^2+b^2)^(7/6)/f/(sec
(f*x+e)^2)^(5/6)+1/6*a*arctan(-1/3*3^(1/2)+2/3*b^(1/3)*(sec(f*x+e)^2)^(1/6)
/(a^2+b^2)^(1/6)*3^(1/2))*(d*sec(f*x+e))^(5/3)/b^(2/3)/(a^2+b^2)^(7/6)/f/(s
ec(f*x+e)^2)^(5/6)*3^(1/2)+1/6*a*arctan(1/3*3^(1/2)+2/3*b^(1/3)*(sec(f*x+e)
^2)^(1/6)/(a^2+b^2)^(1/6)*3^(1/2))*(d*sec(f*x+e))^(5/3)/b^(2/3)/(a^2+b^2)^(
7/6)/f/(sec(f*x+e)^2)^(5/6)*3^(1/2)+AppellF1(1/2,2,1/6,3/2,b^2*tan(f*x+e)^2
/a^2,-tan(f*x+e)^2)*(d*sec(f*x+e))^(5/3)*tan(f*x+e)/a^2/f/(sec(f*x+e)^2)^(5
/6)+1/3*b^2*AppellF1(3/2,2,1/6,5/2,b^2*tan(f*x+e)^2/a^2,-tan(f*x+e)^2)*(d*s
ec(f*x+e))^(5/3)*tan(f*x+e)^3/a^4/f/(sec(f*x+e)^2)^(5/6)-a*b*(d*sec(f*x+e))
^(5/3)/(a^2+b^2)/f/(a^2-b^2*tan(f*x+e)^2)
```

Rubi [A] time = 0.94, antiderivative size = 687, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.520, Rules used = {3512, 757, 429, 444, 51, 63, 296, 634, 618, 204, 628, 208, 510}

$$\frac{b^2\tan^3(e+fx)(d\sec(e+fx))^{5/3}F_1\left(\frac{3}{2};2,\frac{1}{6};\frac{5}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{3a^4f\sec^2(e+fx)^{5/6}}+\frac{\tan(e+fx)(d\sec(e+fx))^{5/3}F_1\left(\frac{1}{2};2,\right.}{a^2f\sec^2(e}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(5/3)/(a + b*Tan[e + f*x])^2,x]
```

```
[Out] -(a*ArcTan[1/Sqrt[3] - (2*b^(1/3)*(Sec[e + f*x]^2)^(1/6))/(Sqrt[3]*(a^2 + b
^2)^(1/6))]*(d*Sec[e + f*x])^(5/3))/(2*Sqrt[3]*b^(2/3)*(a^2 + b^2)^(7/6)*f*
(Sec[e + f*x]^2)^(5/6)) + (a*ArcTan[1/Sqrt[3] + (2*b^(1/3)*(Sec[e + f*x]^2)
^(1/6))/(Sqrt[3]*(a^2 + b^2)^(1/6))]*(d*Sec[e + f*x])^(5/3))/(2*Sqrt[3]*b^(
2/3)*(a^2 + b^2)^(7/6)*f*(Sec[e + f*x]^2)^(5/6)) - (a*ArcTanh[(b^(1/3)*(Sec
[e + f*x]^2)^(1/6))/(a^2 + b^2)^(1/6)]*(d*Sec[e + f*x])^(5/3))/(3*b^(2/3)*(
a^2 + b^2)^(7/6)*f*(Sec[e + f*x]^2)^(5/6)) + (a*Log[(a^2 + b^2)^(1/3) - b^(
1/3)*(a^2 + b^2)^(1/6)*(Sec[e + f*x]^2)^(1/6) + b^(2/3)*(Sec[e + f*x]^2)^(1
/3)]*(d*Sec[e + f*x])^(5/3))/(12*b^(2/3)*(a^2 + b^2)^(7/6)*f*(Sec[e + f*x]^
2)^(5/6)) - (a*Log[(a^2 + b^2)^(1/3) + b^(1/3)*(a^2 + b^2)^(1/6)*(Sec[e + f
*x]^2)^(1/6) + b^(2/3)*(Sec[e + f*x]^2)^(1/3)]*(d*Sec[e + f*x])^(5/3))/(12*
b^(2/3)*(a^2 + b^2)^(7/6)*f*(Sec[e + f*x]^2)^(5/6)) + (AppellF1[1/2, 2, 1/6
, 3/2, (b^2*Tan[e + f*x]^2)/a^2, -Tan[e + f*x]^2]*(d*Sec[e + f*x])^(5/3)*Ta
n[e + f*x])/(a^2*f*(Sec[e + f*x]^2)^(5/6)) + (b^2*AppellF1[3/2, 2, 1/6, 5/2
, (b^2*Tan[e + f*x]^2)/a^2, -Tan[e + f*x]^2]*(d*Sec[e + f*x])^(5/3)*Tan[e +
 f*x]^3)/(3*a^4*f*(Sec[e + f*x]^2)^(5/6)) - (a*b*(d*Sec[e + f*x])^(5/3))/((
a^2 + b^2)*f*(a^2 - b^2*Tan[e + f*x]^2))
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
```

```
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 296

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Module[{r = Numerator
[Rt[-(a/b), n]], s = Denominator[Rt[-(a/b), n]], k, u}, Simp[u = Int[(r*Cos
[(2*k*m*Pi)/n] - s*Cos[(2*k*(m + 1)*Pi)/n]*x)/(r^2 - 2*r*s*Cos[(2*k*Pi)/n]*
x + s^2*x^2), x] + Int[(r*Cos[(2*k*m*Pi)/n] + s*Cos[(2*k*(m + 1)*Pi)/n]*x)/
(r^2 + 2*r*s*Cos[(2*k*Pi)/n]*x + s^2*x^2), x]; (2*r^(m + 2)*Int[1/(r^2 - s^
2*x^2), x])/(a*n*s^m) + Dist[(2*r^(m + 1))/(a*n*s^m), Sum[u, {k, 1, (n - 2)
/4}], x], x]] /; FreeQ[{a, b}, x] && IGtQ[(n - 2)/4, 0] && IGtQ[m, 0] && Lt
Q[m, n - 1] && NegQ[a/b]
```

Rule 429

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[a^p*c^q*x*AppellF1[1/n, -p, -q, 1 + 1/n, -((b*x^n)/a), -((d*x^n)/c)
], x] /; FreeQ[{a, b, c, d, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[n, -1]
 && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 510

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> Simp[(a^p*c^q*(e*x)^(m + 1)*AppellF1[(m + 1)/n, -p, -
q, 1 + (m + 1)/n, -((b*x^n)/a), -((d*x^n)/c)])/(e*(m + 1)), x] /; FreeQ[{a,
 b, c, d, e, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] && NeQ[m, n
 - 1] && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 757

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Int[E
xpandIntegrand[(a + c*x^2)^p, (d/(d^2 - e^2*x^2) - (e*x)/(d^2 - e^2*x^2))^(
-m), x], x] /; FreeQ[{a, c, d, e, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !Inte
gerQ[p] && ILtQ[m, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{(d\sec(e+fx))^{5/3}}{(a+b\tan(e+fx))^2}\,dx = \frac{(d\sec(e+fx))^{5/3}\,\mathrm{Subst}\left(\int \frac{1}{(a+x)^2\sqrt[6]{1+\frac{x^2}{b^2}}}\,dx, x, b\tan(e+fx)\right)}{bf\sec^2(e+fx)^{5/6}}$$

$$= \frac{(d\sec(e+fx))^{5/3}\,\mathrm{Subst}\left(\int \left(\frac{a^2}{\left(a^2-x^2\right)^2\sqrt[6]{1+\frac{x^2}{b^2}}} - \frac{2ax}{\left(a^2-x^2\right)^2\sqrt[6]{1+\frac{x^2}{b^2}}} + \frac{x^2}{\left(-a^2+x^2\right)^2\sqrt[6]{1+\frac{x^2}{b^2}}}\right) dx}{bf\sec^2(e+fx)^{5/6}}$$

$$= \frac{(d\sec(e+fx))^{5/3}\,\mathrm{Subst}\left(\int \frac{x^2}{\left(-a^2+x^2\right)^2\sqrt[6]{1+\frac{x^2}{b^2}}}\,dx, x, b\tan(e+fx)\right)}{bf\sec^2(e+fx)^{5/6}} - \frac{\left(2a(d\sec(e+\right.}{}$$

$$= \frac{F_1\left(\frac{1}{2};2,\frac{1}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)(d\sec(e+fx))^{5/3}\tan(e+fx)}{a^2f\sec^2(e+fx)^{5/6}} + \frac{b^2F_1\left(\right.}{}$$

$$= \frac{F_1\left(\frac{1}{2};2,\frac{1}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)(d\sec(e+fx))^{5/3}\tan(e+fx)}{a^2f\sec^2(e+fx)^{5/6}} + \frac{b^2F_1\left(\right.}{}$$

$$= \frac{F_1\left(\frac{1}{2};2,\frac{1}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)(d\sec(e+fx))^{5/3}\tan(e+fx)}{a^2f\sec^2(e+fx)^{5/6}} + \frac{b^2F_1\left(\right.}{}$$

$$= \frac{F_1\left(\frac{1}{2};2,\frac{1}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)(d\sec(e+fx))^{5/3}\tan(e+fx)}{a^2f\sec^2(e+fx)^{5/6}} + \frac{b^2F_1\left(\right.}{}$$

$$= -\frac{a\tanh^{-1}\left(\frac{\sqrt[3]{b}\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}\right)(d\sec(e+fx))^{5/3}}{3b^{2/3}\left(a^2+b^2\right)^{7/6}f\sec^2(e+fx)^{5/6}} + \frac{F_1\left(\frac{1}{2};2,\frac{1}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(\right.}{a^2f\sec}$$

$$= -\frac{a\tanh^{-1}\left(\frac{\sqrt[3]{b}\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}\right)(d\sec(e+fx))^{5/3}}{3b^{2/3}\left(a^2+b^2\right)^{7/6}f\sec^2(e+fx)^{5/6}} + \frac{a\log\left(\sqrt[3]{a^2+b^2}-\sqrt[3]{b}\sqrt[6]{a^2+b^2}\right.}{12b^{2/3}\left(\right.}$$

$$= -\frac{a\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}}{\sqrt{3}}\right)(d\sec(e+fx))^{5/3}}{2\sqrt{3}\,b^{2/3}\left(a^2+b^2\right)^{7/6}f\sec^2(e+fx)^{5/6}} + \frac{a\tan^{-1}\left(\frac{1+\frac{2\sqrt[3]{b}\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}}{\sqrt{3}}\right)(d\sec(e}{2\sqrt{3}\,b^{2/3}\left(a^2+b^2\right)^{7/6}f\sec^2(e+}$$

Mathematica [C] time = 39.52, size = 3398, normalized size = 4.95

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Sec[e + f*x])^(5/3)/(a + b*Tan[e + f*x])^2,x]
```

```
[Out] (Sec[e + f*x]*(d*Sec[e + f*x])^(5/3)*(a*Cos[e + f*x] + b*Sin[e + f*x])^2*((
b*Cos[e + f*x])/(a*(a - I*b)*(a + I*b)) + Sin[e + f*x]/((a - I*b)*(a + I*b)
) - b/((a - I*b)*(a + I*b)*(a*Cos[e + f*x] + b*Sin[e + f*x]))))/(f*(a + b*T
```

an[e + f*x])^2) - (4*AppellF1[1/3, 1/6, 1/6, 4/3, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])]*(d*Sec[e + f*x])^(5/3)*(a*Cos[e + f*x] + b*Sin[e + f*x])^2)/(a*b*f*(a + b*Tan[e + f*x])*((a + I*b)*AppellF1[4/3, 1/6, 7/6, 7/3, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])] + (a - I*b)*AppellF1[4/3, 7/6, 1/6, 7/3, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])] + 8*AppellF1[1/3, 1/6, 1/6, 4/3, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])]*(a + b*Tan[e + f*x]))) - (Sec[e + f*x]*(d*Sec[e + f*x])^(5/3)*((6*(b + a*Sqrt[1 - Cos[e + f*x]^2]*Sec[e + f*x]))/((a^2 + b^2)*Sec[e + f*x]^(1/3)) + (132*a*b^(2/3)*(5*a^2 + 3*b^2)*AppellF1[5/6, 1/2, 1, 11/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)]*Sqrt[1 - Cos[e + f*x]^2]*Sec[e + f*x]^(8/3) - 240*a*b^(8/3)*AppellF1[11/6, 1/2, 1, 17/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)]*Sqrt[1 - Cos[e + f*x]^2]*Sec[e + f*x]^(14/3) - 55*(-1)^(1/6)*(a^2 - b^2)*(a^2 + b^2)^(5/6)*(-2*ArcTan[Sqrt[3] - (2*(-1)^(1/6)*b^(1/3)*Sec[e + f*x]^(1/3))/(a^2 + b^2)^(1/6)] + 2*ArcTan[Sqrt[3] + (2*(-1)^(1/6)*b^(1/3)*Sec[e + f*x]^(1/3))/(a^2 + b^2)^(1/6)] + 4*ArcTan[((-1)^(1/6)*b^(1/3)*Sec[e + f*x]^(1/3))/(a^2 + b^2)^(1/6)] + Sqrt[3]*Log[(a^2 + b^2)^(1/3) - (-1)^(1/6)*Sqrt[3]*b^(1/3)*(a^2 + b^2)^(1/6)*Sec[e + f*x]^(1/3) + (-1)^(1/3)*b^(2/3)*Sec[e + f*x]^(2/3)] - Sqrt[3]*Log[(a^2 + b^2)^(1/3) + (-1)^(1/6)*Sqrt[3]*b^(1/3)*(a^2 + b^2)^(1/6)*Sec[e + f*x]^(1/3) + (-1)^(1/3)*b^(2/3)*Sec[e + f*x]^(2/3)])*Sqrt[1 - Sec[e + f*x]^2])/(220*b^(2/3)*(a^2 + b^2)^2*Sqrt[1 - Sec[e + f*x]^2]))*(Cos[e + f*x] - Sin[e + f*x])*(Cos[e + f*x] + Sin[e + f*x])*(a*Cos[e + f*x] + b*Sin[e + f*x]))/(6*a*f*(a + b*Tan[e + f*x])^2*((-2*Sec[e + f*x]^(2/3)*(b + a*Sqrt[1 - Cos[e + f*x]^2]*Sec[e + f*x])*Sin[e + f*x])/(a^2 + b^2) + (Sec[e + f*x]^2*(132*a*b^(2/3)*(5*a^2 + 3*b^2)*AppellF1[5/6, 1/2, 1, 11/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)]*Sqrt[1 - Cos[e + f*x]^2]*Sec[e + f*x]^(8/3) - 240*a*b^(8/3)*AppellF1[11/6, 1/2, 1, 17/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)]*Sqrt[1 - Cos[e + f*x]^2]*Sec[e + f*x]^(14/3) - 55*(-1)^(1/6)*(a^2 - b^2)*(a^2 + b^2)^(5/6)*(-2*ArcTan[Sqrt[3] - (2*(-1)^(1/6)*b^(1/3)*Sec[e + f*x]^(1/3))/(a^2 + b^2)^(1/6)] + 2*ArcTan[Sqrt[3] + (2*(-1)^(1/6)*b^(1/3)*Sec[e + f*x]^(1/3))/(a^2 + b^2)^(1/6)] + 4*ArcTan[((-1)^(1/6)*b^(1/3)*Sec[e + f*x]^(1/3))/(a^2 + b^2)^(1/6)] + Sqrt[3]*Log[(a^2 + b^2)^(1/3) - (-1)^(1/6)*Sqrt[3]*b^(1/3)*(a^2 + b^2)^(1/6)*Sec[e + f*x]^(1/3) + (-1)^(1/3)*b^(2/3)*Sec[e + f*x]^(2/3)] - Sqrt[3]*Log[(a^2 + b^2)^(1/3) + (-1)^(1/6)*Sqrt[3]*b^(1/3)*(a^2 + b^2)^(1/6)*Sec[e + f*x]^(1/3) + (-1)^(1/3)*b^(2/3)*Sec[e + f*x]^(2/3)])*Sqrt[1 - Sec[e + f*x]^2])*Tan[e + f*x])/(220*b^(2/3)*(a^2 + b^2)^2*(1 - Sec[e + f*x]^2)^(3/2)) + (6*((a*Sin[e + f*x])/Sqrt[1 - Cos[e + f*x]^2] + a*Sqrt[1 - Cos[e + f*x]^2]*Sec[e + f*x]*Tan[e + f*x]))/((a^2 + b^2)*Sec[e + f*x]^(1/3)) + ((132*a*b^(2/3)*(5*a^2 + 3*b^2)*AppellF1[5/6, 1/2, 1, 11/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)]*Sec[e + f*x]^(5/3)*Sin[e + f*x])/Sqrt[1 - Cos[e + f*x]^2] - (240*a*b^(8/3)*AppellF1[11/6, 1/2, 1, 17/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)]*Sec[e + f*x]^(11/3)*Sin[e + f*x])/Sqrt[1 - Cos[e + f*x]^2] + 352*a*b^(2/3)*(5*a^2 + 3*b^2)*AppellF1[5/6, 1/2, 1, 11/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)]*Sqrt[1 - Cos[e + f*x]^2]*Sec[e + f*x]^(11/3)*Sin[e + f*x] - 1120*a*b^(8/3)*AppellF1[11/6, 1/2, 1, 17/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)]*Sqrt[1 - Cos[e + f*x]^2]*Sec[e + f*x]^(17/3)*Sin[e + f*x] - 55*(-1)^(1/6)*(a^2 - b^2)*(a^2 + b^2)^(5/6)*Sqrt[1 - Sec[e + f*x]^2]*((4*(-1)^(1/6)*b^(1/3)*Sec[e + f*x]^(4/3)*Sin[e + f*x])/(3*(a^2 + b^2)^(1/6)*(1 + (Sqrt[3] - (2*(-1)^(1/6)*b^(1/3)*Sec[e + f*x]^(1/3))/(a^2 + b^2)^(1/6))^2)) + (4*(-1)^(1/6)*b^(1/3)*Sec[e + f*x]^(4/3)*Sin[e + f*x])/(3*(a^2 + b^2)^(1/6)*(1 + (Sqrt[3] + (2*(-1)^(1/6)*b^(1/3)*Sec[e + f*x]^(1/3))/(a^2 + b^2)^(1/6))^2)) + (4*(-1)^(1/6)*b^(1/3)*Sec[e + f*x]^(4/3)*Sin[e + f*x])/(3*(a^2 + b^2)^(1/6)*(1 + ((-1)^(1/3)*b^(2/3)*Sec[e + f*x]^(2/3))/(a^2 + b^2)^(1/3))) + (Sqrt[3]*(-(((-1)^(1/6)*b^(1/3)*(a^2 + b^2)^(1/6)*Sec[e + f*x]^(4/3)*Sin[e + f*x])/Sqrt[3]) + (2*(-1)^(1/3)*b^(2/3)*Sec[e + f*x]^(5/3)*Sin[e + f*x])/3))/((a^2 + b^2)^(1/3) - (-1)^(1/6)*Sqrt[3]*b^(1/3)*(a^2 + b^2)^(1/6)*Sec[e + f*x]^(1/3) + (-1)^(1/3)*b^(2/3)*Sec[e + f*x]^(2/3)) - (Sqrt[3]*(((-1)^(1/6)*b^(1/3)*(a^2 + b^2)^(1/6)*Sec[

```
e + f*x]^(4/3)*Sin[e + f*x])/Sqrt[3] + (2*(-1)^(1/3)*b^(2/3)*Sec[e + f*x]^(
5/3)*Sin[e + f*x])/3))/((a^2 + b^2)^(1/3) + (-1)^(1/6)*Sqrt[3]*b^(1/3)*(a^2
 + b^2)^(1/6)*Sec[e + f*x]^(1/3) + (-1)^(1/3)*b^(2/3)*Sec[e + f*x]^(2/3)))
+ (55*(-1)^(1/6)*(a^2 - b^2)*(a^2 + b^2)^(5/6)*(-2*ArcTan[Sqrt[3] - (2*(-1)
^(1/6)*b^(1/3)*Sec[e + f*x]^(1/3))/(a^2 + b^2)^(1/6)] + 2*ArcTan[Sqrt[3] +
(2*(-1)^(1/6)*b^(1/3)*Sec[e + f*x]^(1/3))/(a^2 + b^2)^(1/6)] + 4*ArcTan[((-
1)^(1/6)*b^(1/3)*Sec[e + f*x]^(1/3))/(a^2 + b^2)^(1/6)] + Sqrt[3]*Log[(a^2
+ b^2)^(1/3) - (-1)^(1/6)*Sqrt[3]*b^(1/3)*(a^2 + b^2)^(1/6)*Sec[e + f*x]^(1
/3) + (-1)^(1/3)*b^(2/3)*Sec[e + f*x]^(2/3)] - Sqrt[3]*Log[(a^2 + b^2)^(1/3
) + (-1)^(1/6)*Sqrt[3]*b^(1/3)*(a^2 + b^2)^(1/6)*Sec[e + f*x]^(1/3) + (-1)^
(1/3)*b^(2/3)*Sec[e + f*x]^(2/3)])*Sec[e + f*x]^2*Tan[e + f*x])/Sqrt[1 - Se
c[e + f*x]^2] + 132*a*b^(2/3)*(5*a^2 + 3*b^2)*Sqrt[1 - Cos[e + f*x]^2]*Sec[
e + f*x]^(8/3)*((10*b^2*AppellF1[11/6, 1/2, 2, 17/6, Sec[e + f*x]^2, (b^2*S
ec[e + f*x]^2)/(a^2 + b^2)]*Sec[e + f*x]^2*Tan[e + f*x])/(11*(a^2 + b^2)) +
 (5*AppellF1[11/6, 3/2, 1, 17/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2
+ b^2)]*Sec[e + f*x]^2*Tan[e + f*x])/11) - 240*a*b^(8/3)*Sqrt[1 - Cos[e + f
*x]^2]*Sec[e + f*x]^(14/3)*((22*b^2*AppellF1[17/6, 1/2, 2, 23/6, Sec[e + f*
x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)]*Sec[e + f*x]^2*Tan[e + f*x])/(17*(a
^2 + b^2)) + (11*AppellF1[17/6, 3/2, 1, 23/6, Sec[e + f*x]^2, (b^2*Sec[e +
f*x]^2)/(a^2 + b^2)]*Sec[e + f*x]^2*Tan[e + f*x])/17))/(220*b^(2/3)*(a^2 +
b^2)^2*Sqrt[1 - Sec[e + f*x]^2])))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)/(a+b*tan(f*x+e))^2,x, algorithm="fricas")
```

```
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(fx+e\right)\right)^{\frac{5}{3}}}{\left(b \tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)/(a+b*tan(f*x+e))^2,x, algorithm="giac")
```

```
[Out] integrate((d*sec(f*x + e))^(5/3)/(b*tan(f*x + e) + a)^2, x)
```

maple [F] time = 1.38, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(fx+e\right)\right)^{\frac{5}{3}}}{\left(a+b \tan\left(fx+e\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(5/3)/(a+b*tan(f*x+e))^2,x)
```

```
[Out] int((d*sec(f*x+e))^(5/3)/(a+b*tan(f*x+e))^2,x)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(5/3)/(a+b*tan(f*x+e))^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{5/3}}{\left(a+b\tan\left(e+f\,x\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(5/3)/(a + b*tan(e + f*x))^2,x)
```

```
[Out] int((d/cos(e + f*x))^(5/3)/(a + b*tan(e + f*x))^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(e+fx\right)\right)^{\frac{5}{3}}}{\left(a+b\tan\left(e+fx\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(5/3)/(a+b*tan(f*x+e))**2,x)
```

```
[Out] Integral((d*sec(e + f*x))**(5/3)/(a + b*tan(e + f*x))**2, x)
```

3.637 $\int \frac{\sqrt[3]{d\sec(e+fx)}}{(a+b\tan(e+fx))^2}\,dx$

Optimal. Leaf size=687

$$\frac{\tan(e+fx)\sqrt[3]{d\sec(e+fx)}\,F_1\left(\frac{1}{2};2,\frac{5}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{a^2 f\sqrt[6]{\sec^2(e+fx)}}-\frac{ab\sqrt[3]{d\sec(e+fx)}}{f\left(a^2+b^2\right)\left(a^2-b^2\tan^2(e+fx)\right)}+\frac{5ab}{}$$

```
[Out] -5/3*a*b^(2/3)*arctanh(b^(1/3)*(sec(f*x+e)^2)^(1/6)/(a^2+b^2)^(1/6))*(d*sec
(f*x+e))^(1/3)/(a^2+b^2)^(11/6)/f/(sec(f*x+e)^2)^(1/6)+5/12*a*b^(2/3)*ln((a
^2+b^2)^(1/3)-b^(1/3)*(a^2+b^2)^(1/6)*(sec(f*x+e)^2)^(1/6)+b^(2/3)*(sec(f*x
+e)^2)^(1/3))*(d*sec(f*x+e))^(1/3)/(a^2+b^2)^(11/6)/f/(sec(f*x+e)^2)^(1/6)-
5/12*a*b^(2/3)*ln((a^2+b^2)^(1/3)+b^(1/3)*(a^2+b^2)^(1/6)*(sec(f*x+e)^2)^(1
/6)+b^(2/3)*(sec(f*x+e)^2)^(1/3))*(d*sec(f*x+e))^(1/3)/(a^2+b^2)^(11/6)/f/(
sec(f*x+e)^2)^(1/6)-5/6*a*b^(2/3)*arctan(-1/3*3^(1/2)+2/3*b^(1/3)*(sec(f*x+
e)^2)^(1/6)/(a^2+b^2)^(1/6)*3^(1/2))*(d*sec(f*x+e))^(1/3)/(a^2+b^2)^(11/6)/
f/(sec(f*x+e)^2)^(1/6)*3^(1/2)-5/6*a*b^(2/3)*arctan(1/3*3^(1/2)+2/3*b^(1/3)
*(sec(f*x+e)^2)^(1/6)/(a^2+b^2)^(1/6)*3^(1/2))*(d*sec(f*x+e))^(1/3)/(a^2+b^
2)^(11/6)/f/(sec(f*x+e)^2)^(1/6)*3^(1/2)+AppellF1(1/2,2,5/6,3/2,b^2*tan(f*x
+e)^2/a^2,-tan(f*x+e)^2)*(d*sec(f*x+e))^(1/3)*tan(f*x+e)/a^2/f/(sec(f*x+e)^
2)^(1/6)+1/3*b^2*AppellF1(3/2,2,5/6,5/2,b^2*tan(f*x+e)^2/a^2,-tan(f*x+e)^2)
*(d*sec(f*x+e))^(1/3)*tan(f*x+e)^3/a^4/f/(sec(f*x+e)^2)^(1/6)-a*b*(d*sec(f*
x+e))^(1/3)/(a^2+b^2)/f/(a^2-b^2*tan(f*x+e)^2)
```

Rubi [A] time = 0.88, antiderivative size = 687, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.520, Rules used = {3512, 757, 429, 444, 51, 63, 210, 634, 618, 204, 628, 208, 510}

$$\frac{b^2\tan^3(e+fx)\sqrt[3]{d\sec(e+fx)}\,F_1\left(\frac{3}{2};2,\frac{5}{6};\frac{5}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{3a^4 f\sqrt[6]{\sec^2(e+fx)}}+\frac{\tan(e+fx)\sqrt[3]{d\sec(e+fx)}\,F_1\left(\frac{1}{2};2,\right.}{a^2 f\sqrt[6]{\sec^2(}}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^(1/3)/(a + b*Tan[e + f*x])^2,x]
```

```
[Out] (5*a*b^(2/3)*ArcTan[1/Sqrt[3] - (2*b^(1/3)*(Sec[e + f*x]^2)^(1/6))/(Sqrt[3]
*(a^2 + b^2)^(1/6))]*(d*Sec[e + f*x])^(1/3))/(2*Sqrt[3]*(a^2 + b^2)^(11/6)*
f*(Sec[e + f*x]^2)^(1/6)) - (5*a*b^(2/3)*ArcTan[1/Sqrt[3] + (2*b^(1/3)*(Sec
[e + f*x]^2)^(1/6))/(Sqrt[3]*(a^2 + b^2)^(1/6))]*(d*Sec[e + f*x])^(1/3))/(2
*Sqrt[3]*(a^2 + b^2)^(11/6)*f*(Sec[e + f*x]^2)^(1/6)) - (5*a*b^(2/3)*ArcTan
h[(b^(1/3)*(Sec[e + f*x]^2)^(1/6))/(a^2 + b^2)^(1/6)]*(d*Sec[e + f*x])^(1/3
))/(3*(a^2 + b^2)^(11/6)*f*(Sec[e + f*x]^2)^(1/6)) + (5*a*b^(2/3)*Log[(a^2
+ b^2)^(1/3) - b^(1/3)*(a^2 + b^2)^(1/6)*(Sec[e + f*x]^2)^(1/6) + b^(2/3)*(
Sec[e + f*x]^2)^(1/3)]*(d*Sec[e + f*x])^(1/3))/(12*(a^2 + b^2)^(11/6)*f*(Se
c[e + f*x]^2)^(1/6)) - (5*a*b^(2/3)*Log[(a^2 + b^2)^(1/3) + b^(1/3)*(a^2 +
b^2)^(1/6)*(Sec[e + f*x]^2)^(1/6) + b^(2/3)*(Sec[e + f*x]^2)^(1/3)]*(d*Sec[
e + f*x])^(1/3))/(12*(a^2 + b^2)^(11/6)*f*(Sec[e + f*x]^2)^(1/6)) + (Appell
F1[1/2, 2, 5/6, 3/2, (b^2*Tan[e + f*x]^2)/a^2, -Tan[e + f*x]^2]*(d*Sec[e +
f*x])^(1/3)*Tan[e + f*x])/(a^2*f*(Sec[e + f*x]^2)^(1/6)) + (b^2*AppellF1[3/
2, 2, 5/6, 5/2, (b^2*Tan[e + f*x]^2)/a^2, -Tan[e + f*x]^2]*(d*Sec[e + f*x])
^(1/3)*Tan[e + f*x]^3)/(3*a^4*f*(Sec[e + f*x]^2)^(1/6)) - (a*b*(d*Sec[e + f
*x])^(1/3))/((a^2 + b^2)*f*(a^2 - b^2*Tan[e + f*x]^2))
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
```

```
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] && !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^(n_))^(-1), x_Symbol] :> Module[{r = Numerator[Rt[-(
a/b), n]], s = Denominator[Rt[-(a/b), n]], k, u}, Simp[u = Int[(r - s*Cos[(
2*k*Pi)/n]*x)/(r^2 - 2*r*s*Cos[(2*k*Pi)/n]*x + s^2*x^2), x] + Int[(r + s*Co
s[(2*k*Pi)/n]*x)/(r^2 + 2*r*s*Cos[(2*k*Pi)/n]*x + s^2*x^2), x]; (2*r^2*Int[
1/(r^2 - s^2*x^2), x])/(a*n) + Dist[(2*r)/(a*n), Sum[u, {k, 1, (n - 2)/4}],
 x], x]] /; FreeQ[{a, b}, x] && IGtQ[(n - 2)/4, 0] && NegQ[a/b]
```

Rule 429

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[a^p*c^q*x*AppellF1[1/n, -p, -q, 1 + 1/n, -((b*x^n)/a), -((d*x^n)/c)
], x] /; FreeQ[{a, b, c, d, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[n, -1]
 && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 510

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> Simp[(a^p*c^q*(e*x)^(m + 1)*AppellF1[(m + 1)/n, -p, -
q, 1 + (m + 1)/n, -((b*x^n)/a), -((d*x^n)/c)])/(e*(m + 1)), x] /; FreeQ[{a,
 b, c, d, e, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] && NeQ[m, n
 - 1] && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
```

```
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 757

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Int[E
xpandIntegrand[(a + c*x^2)^p, (d/(d^2 - e^2*x^2) - (e*x)/(d^2 - e^2*x^2))^(
-m), x], x] /; FreeQ[{a, c, d, e, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !Inte
gerQ[p] && ILtQ[m, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{\sqrt[3]{d\sec(e+fx)}}{(a+b\tan(e+fx))^2}\,dx = \frac{\sqrt[3]{d\sec(e+fx)}\,\text{Subst}\left(\int \frac{1}{(a+x)^2\left(1+\frac{x^2}{b^2}\right)^{5/6}}\,dx,x,b\tan(e+fx)\right)}{bf\sqrt[6]{\sec^2(e+fx)}}$$

$$= \frac{\sqrt[3]{d\sec(e+fx)}\,\text{Subst}\left(\int\left(\frac{a^2}{\left(a^2-x^2\right)^2\left(1+\frac{x^2}{b^2}\right)^{5/6}} - \frac{2ax}{\left(a^2-x^2\right)^2\left(1+\frac{x^2}{b^2}\right)^{5/6}} + \frac{x^2}{\left(-a^2+x^2\right)^2\left(1+\frac{x^2}{b^2}\right)^{5/6}}\right)dx,\right.}{bf\sqrt[6]{\sec^2(e+fx)}}$$

$$= \frac{\sqrt[3]{d\sec(e+fx)}\,\text{Subst}\left(\int \frac{x^2}{\left(-a^2+x^2\right)^2\left(1+\frac{x^2}{b^2}\right)^{5/6}}\,dx,x,b\tan(e+fx)\right)}{bf\sqrt[6]{\sec^2(e+fx)}} - \frac{\left(2a\sqrt[3]{d\sec(e+fx)}\right.}{}$$

$$= \frac{F_1\left(\frac{1}{2};2,\frac{5}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)\sqrt[3]{d\sec(e+fx)}\tan(e+fx)}{a^2f\sqrt[6]{\sec^2(e+fx)}} + \frac{b^2F_1\left(\frac{3}{2};2,\right.}{}$$

$$= \frac{F_1\left(\frac{1}{2};2,\frac{5}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)\sqrt[3]{d\sec(e+fx)}\tan(e+fx)}{a^2f\sqrt[6]{\sec^2(e+fx)}} + \frac{b^2F_1\left(\frac{3}{2};2,\right.}{}$$

$$= \frac{F_1\left(\frac{1}{2};2,\frac{5}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)\sqrt[3]{d\sec(e+fx)}\tan(e+fx)}{a^2f\sqrt[6]{\sec^2(e+fx)}} + \frac{b^2F_1\left(\frac{3}{2};2,\right.}{}$$

$$= \frac{F_1\left(\frac{1}{2};2,\frac{5}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)\sqrt[3]{d\sec(e+fx)}\tan(e+fx)}{a^2f\sqrt[6]{\sec^2(e+fx)}} + \frac{b^2F_1\left(\frac{3}{2};2,\right.}{}$$

$$= -\frac{5ab^{2/3}\tanh^{-1}\left(\frac{\sqrt[3]{b}\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}\right)\sqrt[3]{d\sec(e+fx)}}{3\left(a^2+b^2\right)^{11/6}f\sqrt[6]{\sec^2(e+fx)}} + \frac{F_1\left(\frac{1}{2};2,\frac{5}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(\right.}{a^2f\sqrt[6]{\text{se}}}$$

$$= -\frac{5ab^{2/3}\tanh^{-1}\left(\frac{\sqrt[3]{b}\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}\right)\sqrt[3]{d\sec(e+fx)}}{3\left(a^2+b^2\right)^{11/6}f\sqrt[6]{\sec^2(e+fx)}} + \frac{5ab^{2/3}\log\left(\sqrt[3]{a^2+b^2}-\sqrt[3]{b}\sqrt[6]{a^2+\right.}{12\left(\right.}$$

$$= \frac{5ab^{2/3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}}{\sqrt{3}}\right)\sqrt[3]{d\sec(e+fx)}}{2\sqrt{3}\left(a^2+b^2\right)^{11/6}f\sqrt[6]{\sec^2(e+fx)}} - \frac{5ab^{2/3}\tan^{-1}\left(\frac{1+\frac{2\sqrt[3]{b}\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}}{\sqrt{3}}\right)\sqrt[3]{d\,\text{s}}}{2\sqrt{3}\left(a^2+b^2\right)^{11/6}f\sqrt[6]{\sec^2(e+}}$$

Mathematica [C] time = 25.72, size = 4485, normalized size = 6.53

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Sec[e + f*x])^(1/3)/(a + b*Tan[e + f*x])^2,x]
```

```
[Out] ((d*Sec[e + f*x])^(1/3)*((5*(-1)^(5/6)*a*b^(2/3)*(-2*ArcTan[Sqrt[3] - (2*(-
1)^(1/6)*b^(1/3)*Sec[e + f*x]^(1/3))/(a^2 + b^2)^(1/6)] + 2*ArcTan[Sqrt[3]
```

+ (2*(-1)^(1/6)*b^(1/3)*Sec[e + f*x]^(1/3))/(a^2 + b^2)^(1/6)] + 4*ArcTan[(
(-1)^(1/6)*b^(1/3)*Sec[e + f*x]^(1/3))/(a^2 + b^2)^(1/6)] - Sqrt[3]*Log[(a^
2 + b^2)^(1/3) - (-1)^(1/6)*Sqrt[3]*b^(1/3)*(a^2 + b^2)^(1/6)*Sec[e + f*x]^
(1/3) + (-1)^(1/3)*b^(2/3)*Sec[e + f*x]^(2/3)] + Sqrt[3]*Log[(a^2 + b^2)^(1
/3) + (-1)^(1/6)*Sqrt[3]*b^(1/3)*(a^2 + b^2)^(1/6)*Sec[e + f*x]^(1/3) + (-1
)^(1/3)*b^(2/3)*Sec[e + f*x]^(2/3)]))/(12*(a - I*b)*(a + I*b)*(a^2 + b^2)^(
5/6)) + 3*((-2*b^2*AppellF1[7/6, 1/2, 1, 13/6, Sec[e + f*x]^2, (b^2*Sec[e +
 f*x]^2)/(a^2 + b^2)]*Sqrt[1 - Cos[e + f*x]^2]*Sec[e + f*x]^(10/3))/(21*(a^
2 + b^2)^2*Sqrt[1 - Sec[e + f*x]^2]) + (Sec[e + f*x]^(1/3)*((-(a*b) + b^2*S
qrt[1 - Cos[e + f*x]^2]*Sec[e + f*x])/(a^2 + b^2) + (7*(3*a^2 - 2*b^2)*Appe
llF1[1/6, 1/2, 1, 7/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)]*Sq
rt[1 - Cos[e + f*x]^2]*Sec[e + f*x])/((-1 + Sec[e + f*x]^2)*(7*(a^2 + b^2)*
AppellF1[1/6, 1/2, 1, 7/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)
] + 3*(2*b^2*AppellF1[7/6, 1/2, 2, 13/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^
2)/(a^2 + b^2)] + (a^2 + b^2)*AppellF1[7/6, 3/2, 1, 13/6, Sec[e + f*x]^2, (
b^2*Sec[e + f*x]^2)/(a^2 + b^2)])*Sec[e + f*x]^2))))/(3*(a^2 - b^2*(-1 + Se
c[e + f*x]^2))))))/(f*(a + b*Tan[e + f*x])^2*((5*(-1)^(5/6)*a*b^(2/3)*((4*(
-1)^(1/6)*b^(1/3)*Sec[e + f*x]^(4/3)*Sin[e + f*x])/(3*(a^2 + b^2)^(1/6)*(1
+ (Sqrt[3] - (2*(-1)^(1/6)*b^(1/3)*Sec[e + f*x]^(1/3))/(a^2 + b^2)^(1/6))^2
)) + (4*(-1)^(1/6)*b^(1/3)*Sec[e + f*x]^(4/3)*Sin[e + f*x])/(3*(a^2 + b^2)^
(1/6)*(1 + (Sqrt[3] + (2*(-1)^(1/6)*b^(1/3)*Sec[e + f*x]^(1/3))/(a^2 + b^2)
^(1/6))^2)) + (4*(-1)^(1/6)*b^(1/3)*Sec[e + f*x]^(4/3)*Sin[e + f*x])/(3*(a^
2 + b^2)^(1/6)*(1 + ((-1)^(1/3)*b^(2/3)*Sec[e + f*x]^(2/3))/(a^2 + b^2)^(1/
3))) - (Sqrt[3]*(-(((-1)^(1/6)*b^(1/3)*(a^2 + b^2)^(1/6)*Sec[e + f*x]^(4/3)
*Sin[e + f*x])/Sqrt[3]) + (2*(-1)^(1/3)*b^(2/3)*Sec[e + f*x]^(5/3)*Sin[e +
f*x])/3))/((a^2 + b^2)^(1/3) - (-1)^(1/6)*Sqrt[3]*b^(1/3)*(a^2 + b^2)^(1/6)
*Sec[e + f*x]^(1/3) + (-1)^(1/3)*b^(2/3)*Sec[e + f*x]^(2/3)) + (Sqrt[3]*(((
-1)^(1/6)*b^(1/3)*(a^2 + b^2)^(1/6)*Sec[e + f*x]^(4/3)*Sin[e + f*x])/Sqrt[3
] + (2*(-1)^(1/3)*b^(2/3)*Sec[e + f*x]^(5/3)*Sin[e + f*x])/3))/((a^2 + b^2)
^(1/3) + (-1)^(1/6)*Sqrt[3]*b^(1/3)*(a^2 + b^2)^(1/6)*Sec[e + f*x]^(1/3) +
(-1)^(1/3)*b^(2/3)*Sec[e + f*x]^(2/3))))/(12*(a - I*b)*(a + I*b)*(a^2 + b^2
)^(5/6)) + 3*((-2*b^2*AppellF1[7/6, 1/2, 1, 13/6, Sec[e + f*x]^2, (b^2*Sec[
e + f*x]^2)/(a^2 + b^2)]*Sqrt[1 - Cos[e + f*x]^2]*Sec[e + f*x]^(19/3)*Sin[e
 + f*x])/(21*(a^2 + b^2)^2*(1 - Sec[e + f*x]^2)^(3/2)) - (2*b^2*AppellF1[7/
6, 1/2, 1, 13/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)]*Sec[e +
f*x]^(7/3)*Sin[e + f*x])/(21*(a^2 + b^2)^2*Sqrt[1 - Cos[e + f*x]^2]*Sqrt[1
- Sec[e + f*x]^2]) - (20*b^2*AppellF1[7/6, 1/2, 1, 13/6, Sec[e + f*x]^2, (b
^2*Sec[e + f*x]^2)/(a^2 + b^2)]*Sqrt[1 - Cos[e + f*x]^2]*Sec[e + f*x]^(13/3
)*Sin[e + f*x])/(63*(a^2 + b^2)^2*Sqrt[1 - Sec[e + f*x]^2]) + (2*b^2*Sec[e
+ f*x]^(10/3)*((-(a*b) + b^2*Sqrt[1 - Cos[e + f*x]^2]*Sec[e + f*x])/(a^2 +
b^2) + (7*(3*a^2 - 2*b^2)*AppellF1[1/6, 1/2, 1, 7/6, Sec[e + f*x]^2, (b^2*S
ec[e + f*x]^2)/(a^2 + b^2)]*Sqrt[1 - Cos[e + f*x]^2]*Sec[e + f*x])/((-1 + S
ec[e + f*x]^2)*(7*(a^2 + b^2)*AppellF1[1/6, 1/2, 1, 7/6, Sec[e + f*x]^2, (b
^2*Sec[e + f*x]^2)/(a^2 + b^2)] + 3*(2*b^2*AppellF1[7/6, 1/2, 2, 13/6, Sec[
e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)] + (a^2 + b^2)*AppellF1[7/6, 3
/2, 1, 13/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)])*Sec[e + f*x
]^2)))*Sin[e + f*x])/(3*(a^2 - b^2*(-1 + Sec[e + f*x]^2))^2) + (Sec[e + f*x
]^(4/3)*((-(a*b) + b^2*Sqrt[1 - Cos[e + f*x]^2]*Sec[e + f*x])/(a^2 + b^2) +
 (7*(3*a^2 - 2*b^2)*AppellF1[1/6, 1/2, 1, 7/6, Sec[e + f*x]^2, (b^2*Sec[e +
 f*x]^2)/(a^2 + b^2)]*Sqrt[1 - Cos[e + f*x]^2]*Sec[e + f*x])/((-1 + Sec[e +
 f*x]^2)*(7*(a^2 + b^2)*AppellF1[1/6, 1/2, 1, 7/6, Sec[e + f*x]^2, (b^2*Sec
[e + f*x]^2)/(a^2 + b^2)] + 3*(2*b^2*AppellF1[7/6, 1/2, 2, 13/6, Sec[e + f*
x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)] + (a^2 + b^2)*AppellF1[7/6, 3/2, 1,
 13/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)])*Sec[e + f*x]^2)))
*Sin[e + f*x])/(9*(a^2 - b^2*(-1 + Sec[e + f*x]^2))) - (2*b^2*Sqrt[1 - Cos[
e + f*x]^2]*Sec[e + f*x]^(10/3)*((14*b^2*AppellF1[13/6, 1/2, 2, 19/6, Sec[e
 + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)]*Sec[e + f*x]^2*Tan[e + f*x])/(
13*(a^2 + b^2)) + (7*AppellF1[13/6, 3/2, 1, 19/6, Sec[e + f*x]^2, (b^2*Sec[
e + f*x]^2)/(a^2 + b^2)]*Sec[e + f*x]^2*Tan[e + f*x])/13))/(21*(a^2 + b^2)^

```
2*Sqrt[1 - Sec[e + f*x]^2]) + (Sec[e + f*x]^(1/3)*((7*(3*a^2 - 2*b^2)*Appel
lF1[1/6, 1/2, 1, 7/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)]*Sin
[e + f*x])/(Sqrt[1 - Cos[e + f*x]^2]*(-1 + Sec[e + f*x]^2)*(7*(a^2 + b^2)*A
ppellF1[1/6, 1/2, 1, 7/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)]
 + 3*(2*b^2*AppellF1[7/6, 1/2, 2, 13/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2
)/(a^2 + b^2)] + (a^2 + b^2)*AppellF1[7/6, 3/2, 1, 13/6, Sec[e + f*x]^2, (b
^2*Sec[e + f*x]^2)/(a^2 + b^2)])*Sec[e + f*x]^2)) - (14*(3*a^2 - 2*b^2)*App
ellF1[1/6, 1/2, 1, 7/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)]*S
qrt[1 - Cos[e + f*x]^2]*Sec[e + f*x]^3*Tan[e + f*x])/((-1 + Sec[e + f*x]^2)
^2*(7*(a^2 + b^2)*AppellF1[1/6, 1/2, 1, 7/6, Sec[e + f*x]^2, (b^2*Sec[e + f
*x]^2)/(a^2 + b^2)] + 3*(2*b^2*AppellF1[7/6, 1/2, 2, 13/6, Sec[e + f*x]^2,
(b^2*Sec[e + f*x]^2)/(a^2 + b^2)] + (a^2 + b^2)*AppellF1[7/6, 3/2, 1, 13/6,
 Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)])*Sec[e + f*x]^2)) + (7*(
3*a^2 - 2*b^2)*AppellF1[1/6, 1/2, 1, 7/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]
^2)/(a^2 + b^2)]*Sqrt[1 - Cos[e + f*x]^2]*Sec[e + f*x]*Tan[e + f*x])/((-1 +
 Sec[e + f*x]^2)*(7*(a^2 + b^2)*AppellF1[1/6, 1/2, 1, 7/6, Sec[e + f*x]^2,
(b^2*Sec[e + f*x]^2)/(a^2 + b^2)] + 3*(2*b^2*AppellF1[7/6, 1/2, 2, 13/6, Se
c[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)] + (a^2 + b^2)*AppellF1[7/6,
 3/2, 1, 13/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)])*Sec[e + f
*x]^2)) + ((b^2*Sin[e + f*x])/Sqrt[1 - Cos[e + f*x]^2] + b^2*Sqrt[1 - Cos[e
 + f*x]^2]*Sec[e + f*x]*Tan[e + f*x])/(a^2 + b^2) + (7*(3*a^2 - 2*b^2)*Sqrt
[1 - Cos[e + f*x]^2]*Sec[e + f*x]*((2*b^2*AppellF1[7/6, 1/2, 2, 13/6, Sec[e
 + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)]*Sec[e + f*x]^2*Tan[e + f*x])/(
7*(a^2 + b^2)) + (AppellF1[7/6, 3/2, 1, 13/6, Sec[e + f*x]^2, (b^2*Sec[e +
f*x]^2)/(a^2 + b^2)]*Sec[e + f*x]^2*Tan[e + f*x])/7))/((-1 + Sec[e + f*x]^2
)*(7*(a^2 + b^2)*AppellF1[1/6, 1/2, 1, 7/6, Sec[e + f*x]^2, (b^2*Sec[e + f*
x]^2)/(a^2 + b^2)] + 3*(2*b^2*AppellF1[7/6, 1/2, 2, 13/6, Sec[e + f*x]^2, (
b^2*Sec[e + f*x]^2)/(a^2 + b^2)] + (a^2 + b^2)*AppellF1[7/6, 3/2, 1, 13/6,
Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)])*Sec[e + f*x]^2)) - (7*(3
*a^2 - 2*b^2)*AppellF1[1/6, 1/2, 1, 7/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^
2)/(a^2 + b^2)]*Sqrt[1 - Cos[e + f*x]^2]*Sec[e + f*x]*(6*(2*b^2*AppellF1[7/
6, 1/2, 2, 13/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)] + (a^2 +
 b^2)*AppellF1[7/6, 3/2, 1, 13/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2
 + b^2)])*Sec[e + f*x]^2*Tan[e + f*x] + 7*(a^2 + b^2)*((2*b^2*AppellF1[7/6,
 1/2, 2, 13/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)]*Sec[e + f*
x]^2*Tan[e + f*x])/(7*(a^2 + b^2)) + (AppellF1[7/6, 3/2, 1, 13/6, Sec[e + f
*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)]*Sec[e + f*x]^2*Tan[e + f*x])/7) +
3*Sec[e + f*x]^2*(2*b^2*((28*b^2*AppellF1[13/6, 1/2, 3, 19/6, Sec[e + f*x]^
2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)]*Sec[e + f*x]^2*Tan[e + f*x])/(13*(a^2
+ b^2)) + (7*AppellF1[13/6, 3/2, 2, 19/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]
^2)/(a^2 + b^2)]*Sec[e + f*x]^2*Tan[e + f*x])/13) + (a^2 + b^2)*((14*b^2*Ap
pellF1[13/6, 3/2, 2, 19/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)
]*Sec[e + f*x]^2*Tan[e + f*x])/(13*(a^2 + b^2)) + (21*AppellF1[13/6, 5/2, 1
, 19/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)]*Sec[e + f*x]^2*Ta
n[e + f*x])/13))))/((-1 + Sec[e + f*x]^2)*(7*(a^2 + b^2)*AppellF1[1/6, 1/2,
 1, 7/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)] + 3*(2*b^2*Appel
lF1[7/6, 1/2, 2, 13/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)] +
(a^2 + b^2)*AppellF1[7/6, 3/2, 1, 13/6, Sec[e + f*x]^2, (b^2*Sec[e + f*x]^2
)/(a^2 + b^2)])*Sec[e + f*x]^2)^2)))/(3*(a^2 - b^2*(-1 + Sec[e + f*x]^2))))
))
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)/(a+b*tan(f*x+e))^2,x, algorithm="fricas")

[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}}{\left(b\tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)/(a+b*tan(f*x+e))^2,x, algorithm="giac")
[Out] integrate((d*sec(f*x + e))^(1/3)/(b*tan(f*x + e) + a)^2, x)
```

maple [F] time = 1.37, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}}{\left(a+b\tan\left(fx+e\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^(1/3)/(a+b*tan(f*x+e))^2,x)
[Out] int((d*sec(f*x+e))^(1/3)/(a+b*tan(f*x+e))^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(fx+e\right)\right)^{\frac{1}{3}}}{\left(b\tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^(1/3)/(a+b*tan(f*x+e))^2,x, algorithm="maxima")
[Out] integrate((d*sec(f*x + e))^(1/3)/(b*tan(f*x + e) + a)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{1/3}}{\left(a+b\,\tan\left(e+f\,x\right)\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^(1/3)/(a + b*tan(e + f*x))^2,x)
[Out] int((d/cos(e + f*x))^(1/3)/(a + b*tan(e + f*x))^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt[3]{d\sec\left(e+fx\right)}}{\left(a+b\tan\left(e+fx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**(1/3)/(a+b*tan(f*x+e))**2,x)
[Out] Integral((d*sec(e + f*x))**(1/3)/(a + b*tan(e + f*x))**2, x)
```

3.638 $\int \frac{1}{\sqrt[3]{d\sec(e+fx)}\,(a+b\tan(e+fx))^2}\,dx$

Optimal. Leaf size=715

$$\frac{\tan(e+fx)\sqrt[6]{\sec^2(e+fx)}\,F_1\left(\frac{1}{2};2,\frac{7}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{a^2f\sqrt[3]{d\sec(e+fx)}}+\frac{7ab}{f\left(a^2+b^2\right)^2\sqrt[3]{d\sec(e+fx)}}-\frac{}{f\left(a^2+b^2\right)\sqrt[3]{}}$$

```
[Out] 7*a*b/(a^2+b^2)^2/f/(d*sec(f*x+e))^(1/3)-7/3*a*b^(4/3)*arctanh(b^(1/3)*(sec
(f*x+e)^2)^(1/6)/(a^2+b^2)^(1/6))*(sec(f*x+e)^2)^(1/6)/(a^2+b^2)^(13/6)/f/(
d*sec(f*x+e))^(1/3)+7/12*a*b^(4/3)*ln((a^2+b^2)^(1/3)-b^(1/3)*(a^2+b^2)^(1/
6)*(sec(f*x+e)^2)^(1/6)+b^(2/3)*(sec(f*x+e)^2)^(1/3))*(sec(f*x+e)^2)^(1/6)/
(a^2+b^2)^(13/6)/f/(d*sec(f*x+e))^(1/3)-7/12*a*b^(4/3)*ln((a^2+b^2)^(1/3)+b
^(1/3)*(a^2+b^2)^(1/6)*(sec(f*x+e)^2)^(1/6)+b^(2/3)*(sec(f*x+e)^2)^(1/3))*(
sec(f*x+e)^2)^(1/6)/(a^2+b^2)^(13/6)/f/(d*sec(f*x+e))^(1/3)+7/6*a*b^(4/3)*a
rctan(-1/3*3^(1/2)+2/3*b^(1/3)*(sec(f*x+e)^2)^(1/6)/(a^2+b^2)^(1/6)*3^(1/2)
)*(sec(f*x+e)^2)^(1/6)/(a^2+b^2)^(13/6)/f/(d*sec(f*x+e))^(1/3)*3^(1/2)+7/6*
a*b^(4/3)*arctan(1/3*3^(1/2)+2/3*b^(1/3)*(sec(f*x+e)^2)^(1/6)/(a^2+b^2)^(1/
6)*3^(1/2))*(sec(f*x+e)^2)^(1/6)/(a^2+b^2)^(13/6)/f/(d*sec(f*x+e))^(1/3)*3^
(1/2)+AppellF1(1/2,2,7/6,3/2,b^2*tan(f*x+e)^2/a^2,-tan(f*x+e)^2)*(sec(f*x+e
)^2)^(1/6)*tan(f*x+e)/a^2/f/(d*sec(f*x+e))^(1/3)+1/3*b^2*AppellF1(3/2,2,7/6
,5/2,b^2*tan(f*x+e)^2/a^2,-tan(f*x+e)^2)*(sec(f*x+e)^2)^(1/6)*tan(f*x+e)^3/
a^4/f/(d*sec(f*x+e))^(1/3)-a*b/(a^2+b^2)/f/(d*sec(f*x+e))^(1/3)/(a^2-b^2*ta
n(f*x+e)^2)
```

Rubi [A] time = 0.99, antiderivative size = 715, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.520, Rules used = {3512, 757, 429, 444, 51, 63, 296, 634, 618, 204, 628, 208, 510}

$$\frac{b^2\tan^3(e+fx)\sqrt[6]{\sec^2(e+fx)}\,F_1\left(\frac{3}{2};2,\frac{7}{6};\frac{5}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{3a^4f\sqrt[3]{d\sec(e+fx)}}+\frac{\tan(e+fx)\sqrt[6]{\sec^2(e+fx)}\,F_1\left(\frac{1}{2};2,\frac{7}{6};\frac{3}{2};\right.}{a^2f\sqrt[3]{d\sec(e+}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((d*Sec[e + f*x])^(1/3)*(a + b*Tan[e + f*x])^2),x]
```

```
[Out] (7*a*b)/((a^2 + b^2)^2*f*(d*Sec[e + f*x])^(1/3)) - (7*a*b^(4/3)*ArcTan[1/Sq
rt[3] - (2*b^(1/3)*(Sec[e + f*x]^2)^(1/6))/(Sqrt[3]*(a^2 + b^2)^(1/6))]*(Se
c[e + f*x]^2)^(1/6))/(2*Sqrt[3]*(a^2 + b^2)^(13/6)*f*(d*Sec[e + f*x])^(1/3)
) + (7*a*b^(4/3)*ArcTan[1/Sqrt[3] + (2*b^(1/3)*(Sec[e + f*x]^2)^(1/6))/(Sqr
t[3]*(a^2 + b^2)^(1/6))]*(Sec[e + f*x]^2)^(1/6))/(2*Sqrt[3]*(a^2 + b^2)^(13
/6)*f*(d*Sec[e + f*x])^(1/3)) - (7*a*b^(4/3)*ArcTanh[(b^(1/3)*(Sec[e + f*x]
^2)^(1/6))/(a^2 + b^2)^(1/6)]*(Sec[e + f*x]^2)^(1/6))/(3*(a^2 + b^2)^(13/6)
*f*(d*Sec[e + f*x])^(1/3)) + (7*a*b^(4/3)*Log[(a^2 + b^2)^(1/3) - b^(1/3)*(
a^2 + b^2)^(1/6)*(Sec[e + f*x]^2)^(1/6) + b^(2/3)*(Sec[e + f*x]^2)^(1/3)]*(
Sec[e + f*x]^2)^(1/6))/(12*(a^2 + b^2)^(13/6)*f*(d*Sec[e + f*x])^(1/3)) - (
7*a*b^(4/3)*Log[(a^2 + b^2)^(1/3) + b^(1/3)*(a^2 + b^2)^(1/6)*(Sec[e + f*x]
^2)^(1/6) + b^(2/3)*(Sec[e + f*x]^2)^(1/3)]*(Sec[e + f*x]^2)^(1/6))/(12*(a^
2 + b^2)^(13/6)*f*(d*Sec[e + f*x])^(1/3)) + (AppellF1[1/2, 2, 7/6, 3/2, (b^
2*Tan[e + f*x]^2)/a^2, -Tan[e + f*x]^2]*(Sec[e + f*x]^2)^(1/6)*Tan[e + f*x]
)/(a^2*f*(d*Sec[e + f*x])^(1/3)) + (b^2*AppellF1[3/2, 2, 7/6, 5/2, (b^2*Tan
[e + f*x]^2)/a^2, -Tan[e + f*x]^2]*(Sec[e + f*x]^2)^(1/6)*Tan[e + f*x]^3)/(
3*a^4*f*(d*Sec[e + f*x])^(1/3)) - (a*b)/((a^2 + b^2)*f*(d*Sec[e + f*x])^(1/
3)*(a^2 - b^2*Tan[e + f*x]^2))
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 296

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Module[{r = Numerator
[Rt[-(a/b), n]], s = Denominator[Rt[-(a/b), n]], k, u}, Simp[u = Int[(r*Cos
[(2*k*m*Pi)/n] - s*Cos[(2*k*(m + 1)*Pi)/n]*x)/(r^2 - 2*r*s*Cos[(2*k*Pi)/n]*
x + s^2*x^2), x] + Int[(r*Cos[(2*k*m*Pi)/n] + s*Cos[(2*k*(m + 1)*Pi)/n]*x)/
(r^2 + 2*r*s*Cos[(2*k*Pi)/n]*x + s^2*x^2), x]; (2*r^(m + 2)*Int[1/(r^2 - s^
2*x^2), x])/(a*n*s^m) + Dist[(2*r^(m + 1))/(a*n*s^m), Sum[u, {k, 1, (n - 2)
/4}], x], x]] /; FreeQ[{a, b}, x] && IGtQ[(n - 2)/4, 0] && IGtQ[m, 0] && Lt
Q[m, n - 1] && NegQ[a/b]
```

Rule 429

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[a^p*c^q*x*AppellF1[1/n, -p, -q, 1 + 1/n, -((b*x^n)/a), -((d*x^n)/c)
], x] /; FreeQ[{a, b, c, d, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[n, -1]
 && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 510

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> Simp[(a^p*c^q*(e*x)^(m + 1)*AppellF1[(m + 1)/n, -p, -
q, 1 + (m + 1)/n, -((b*x^n)/a), -((d*x^n)/c)])/(e*(m + 1)), x] /; FreeQ[{a,
 b, c, d, e, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] && NeQ[m, n
 - 1] && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 757

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Int[E
xpandIntegrand[(a + c*x^2)^p, (d/(d^2 - e^2*x^2) - (e*x)/(d^2 - e^2*x^2))^(
-m), x], x] /; FreeQ[{a, c, d, e, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !Inte
gerQ[p] && ILtQ[m, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{1}{\sqrt[3]{d\sec(e+fx)}\,(a+b\tan(e+fx))^2}\,dx = \frac{\sqrt[6]{\sec^2(e+fx)}\,\text{Subst}\left(\int \frac{1}{(a+x)^2\left(1+\frac{x^2}{b^2}\right)^{7/6}}\,dx, x, b\tan(e+fx)\right)}{bf\sqrt[3]{d\sec(e+fx)}}$$

$$= \frac{\sqrt[6]{\sec^2(e+fx)}\,\text{Subst}\left(\int\left(\frac{a^2}{\left(a^2-x^2\right)^2\left(1+\frac{x^2}{b^2}\right)^{7/6}} - \frac{2ax}{\left(a^2-x^2\right)^2\left(1+\frac{x^2}{b^2}\right)^{7/6}} + \frac{}{\left(-a^2 \ldots\right.}\right.\right.}{bf\sqrt[3]{d\sec(e+fx)}}$$

$$= \frac{\sqrt[6]{\sec^2(e+fx)}\,\text{Subst}\left(\int \frac{x^2}{\left(-a^2+x^2\right)^2\left(1+\frac{x^2}{b^2}\right)^{7/6}}\,dx, x, b\tan(e+fx)\right)}{bf\sqrt[3]{d\sec(e+fx)}} - \ldots$$

$$= \frac{F_1\left(\frac{1}{2}; 2, \frac{7}{6}; \frac{3}{2}; \frac{b^2\tan^2(e+fx)}{a^2}, -\tan^2(e+fx)\right)\sqrt[6]{\sec^2(e+fx)}\,\tan(e+\ldots}{a^2 f\sqrt[3]{d\sec(e+fx)}}$$

$$= \frac{F_1\left(\frac{1}{2}; 2, \frac{7}{6}; \frac{3}{2}; \frac{b^2\tan^2(e+fx)}{a^2}, -\tan^2(e+fx)\right)\sqrt[6]{\sec^2(e+fx)}\,\tan(e+\ldots}{a^2 f\sqrt[3]{d\sec(e+fx)}}$$

$$= \frac{7ab}{\left(a^2+b^2\right)^2 f\sqrt[3]{d\sec(e+fx)}} + \frac{F_1\left(\frac{1}{2}; 2, \frac{7}{6}; \frac{3}{2}; \frac{b^2\tan^2(e+fx)}{a^2}, -\tan^2(e\ldots\right.}{a^2 f\sqrt[3]{d\,\text{se}\ldots}}$$

$$= \frac{7ab}{\left(a^2+b^2\right)^2 f\sqrt[3]{d\sec(e+fx)}} + \frac{F_1\left(\frac{1}{2}; 2, \frac{7}{6}; \frac{3}{2}; \frac{b^2\tan^2(e+fx)}{a^2}, -\tan^2(e\ldots\right.}{a^2 f\sqrt[3]{d\,\text{se}\ldots}}$$

$$= \frac{7ab}{\left(a^2+b^2\right)^2 f\sqrt[3]{d\sec(e+fx)}} + \frac{F_1\left(\frac{1}{2}; 2, \frac{7}{6}; \frac{3}{2}; \frac{b^2\tan^2(e+fx)}{a^2}, -\tan^2(e\ldots\right.}{a^2 f\sqrt[3]{d\,\text{se}\ldots}}$$

$$= \frac{7ab}{\left(a^2+b^2\right)^2 f\sqrt[3]{d\sec(e+fx)}} - \frac{7ab^{4/3}\tanh^{-1}\left(\frac{\sqrt[3]{b}\,\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}\right)\sqrt[6]{\text{se}\ldots}}{3\left(a^2+b^2\right)^{13/6} f\sqrt[3]{d\sec(e+\ldots}}$$

$$= \frac{7ab}{\left(a^2+b^2\right)^2 f\sqrt[3]{d\sec(e+fx)}} - \frac{7ab^{4/3}\tanh^{-1}\left(\frac{\sqrt[3]{b}\,\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}\right)\sqrt[6]{\text{se}\ldots}}{3\left(a^2+b^2\right)^{13/6} f\sqrt[3]{d\sec(e+\ldots}}$$

$$= \frac{7ab}{\left(a^2+b^2\right)^2 f\sqrt[3]{d\sec(e+fx)}} - \frac{7ab^{4/3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}\,\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}}{\sqrt{3}}\right)\sqrt[6]{\text{se}\ldots}}{2\sqrt{3}\left(a^2+b^2\right)^{13/6} f\sqrt[3]{d\sec(e\ldots}}$$

Mathematica [C] time = 51.98, size = 9626, normalized size = 13.46

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/((d*Sec[e + f*x])^(1/3)*(a + b*Tan[e + f*x])^2),x]
[Out] Result too large to show
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(1/3)/(a+b*tan(f*x+e))^2,x, algorithm="fricas")
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d \sec\left(fx+e\right)\right)^{\frac{1}{3}} \left(b \tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(1/3)/(a+b*tan(f*x+e))^2,x, algorithm="giac")
[Out] integrate(1/((d*sec(f*x + e))^(1/3)*(b*tan(f*x + e) + a)^2), x)
```

maple [F] time = 1.38, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d \sec\left(fx+e\right)\right)^{\frac{1}{3}} \left(a+b \tan\left(fx+e\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*sec(f*x+e))^(1/3)/(a+b*tan(f*x+e))^2,x)
[Out] int(1/(d*sec(f*x+e))^(1/3)/(a+b*tan(f*x+e))^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d \sec\left(fx+e\right)\right)^{\frac{1}{3}} \left(b \tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(1/3)/(a+b*tan(f*x+e))^2,x, algorithm="maxima")
[Out] integrate(1/((d*sec(f*x + e))^(1/3)*(b*tan(f*x + e) + a)^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{1/3}\,{\left(a+b\,\tan\left(e+f\,x\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d/cos(e + f*x))^(1/3)*(a + b*tan(e + f*x))^2),x)
[Out] int(1/((d/cos(e + f*x))^(1/3)*(a + b*tan(e + f*x))^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt[3]{d \sec{\left(e+fx \right)}} \left(a+b \tan{\left(e+fx \right)}\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))**(1/3)/(a+b*tan(f*x+e))**2,x)
```

```
[Out] Integral(1/((d*sec(e + f*x))**(1/3)*(a + b*tan(e + f*x))**2), x)
```

3.639 $\int \frac{1}{(d\sec(e+fx))^{5/3}(a+b\tan(e+fx))^2}\,dx$

Optimal. Leaf size=717

$$\frac{\tan(e+fx)\sec^2(e+fx)^{5/6}F_1\left(\frac{1}{2};2,\frac{11}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{a^2f(d\sec(e+fx))^{5/3}}+\frac{11ab}{5f\left(a^2+b^2\right)^2(d\sec(e+fx))^{5/3}}-\frac{}{f\left(a^2+b\right.}$$

```
[Out] 11/5*a*b/(a^2+b^2)^2/f/(d*sec(f*x+e))^(5/3)-11/3*a*b^(8/3)*arctanh(b^(1/3)*
(sec(f*x+e)^2)^(1/6)/(a^2+b^2)^(1/6))*(sec(f*x+e)^2)^(5/6)/(a^2+b^2)^(17/6)
/f/(d*sec(f*x+e))^(5/3)+11/12*a*b^(8/3)*ln((a^2+b^2)^(1/3)-b^(1/3)*(a^2+b^2
)^(1/6)*(sec(f*x+e)^2)^(1/6)+b^(2/3)*(sec(f*x+e)^2)^(1/3))*(sec(f*x+e)^2)^(
5/6)/(a^2+b^2)^(17/6)/f/(d*sec(f*x+e))^(5/3)-11/12*a*b^(8/3)*ln((a^2+b^2)^(
1/3)+b^(1/3)*(a^2+b^2)^(1/6)*(sec(f*x+e)^2)^(1/6)+b^(2/3)*(sec(f*x+e)^2)^(1
/3))*(sec(f*x+e)^2)^(5/6)/(a^2+b^2)^(17/6)/f/(d*sec(f*x+e))^(5/3)-11/6*a*b^
(8/3)*arctan(-1/3*3^(1/2)+2/3*b^(1/3)*(sec(f*x+e)^2)^(1/6)/(a^2+b^2)^(1/6)*
3^(1/2))*(sec(f*x+e)^2)^(5/6)/(a^2+b^2)^(17/6)/f/(d*sec(f*x+e))^(5/3)*3^(1/
2)-11/6*a*b^(8/3)*arctan(1/3*3^(1/2)+2/3*b^(1/3)*(sec(f*x+e)^2)^(1/6)/(a^2+
b^2)^(1/6)*3^(1/2))*(sec(f*x+e)^2)^(5/6)/(a^2+b^2)^(17/6)/f/(d*sec(f*x+e))^
(5/3)*3^(1/2)+AppellF1(1/2,2,11/6,3/2,b^2*tan(f*x+e)^2/a^2,-tan(f*x+e)^2)*(
sec(f*x+e)^2)^(5/6)*tan(f*x+e)/a^2/f/(d*sec(f*x+e))^(5/3)+1/3*b^2*AppellF1(
3/2,2,11/6,5/2,b^2*tan(f*x+e)^2/a^2,-tan(f*x+e)^2)*(sec(f*x+e)^2)^(5/6)*tan
(f*x+e)^3/a^4/f/(d*sec(f*x+e))^(5/3)-a*b/(a^2+b^2)/f/(d*sec(f*x+e))^(5/3)/(
a^2-b^2*tan(f*x+e)^2)
```

Rubi [A] time = 0.97, antiderivative size = 717, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.520, Rules used = {3512, 757, 429, 444, 51, 63, 210, 634, 618, 204, 628, 208, 510}

$$\frac{b^2\tan^3(e+fx)\sec^2(e+fx)^{5/6}F_1\left(\frac{3}{2};2,\frac{11}{6};\frac{5}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{3a^4f(d\sec(e+fx))^{5/3}}+\frac{\tan(e+fx)\sec^2(e+fx)^{5/6}F_1\left(\frac{1}{2};2,\frac{11}{6}\right.}{a^2f(d\sec(e+\right.}$$

Antiderivative was successfully verified.

```
[In] Int[1/((d*Sec[e + f*x])^(5/3)*(a + b*Tan[e + f*x])^2),x]
```

```
[Out] (11*a*b)/(5*(a^2 + b^2)^2*f*(d*Sec[e + f*x])^(5/3)) + (11*a*b^(8/3)*ArcTan[
1/Sqrt[3] - (2*b^(1/3)*(Sec[e + f*x]^2)^(1/6))/(Sqrt[3]*(a^2 + b^2)^(1/6))]
*(Sec[e + f*x]^2)^(5/6))/(2*Sqrt[3]*(a^2 + b^2)^(17/6)*f*(d*Sec[e + f*x])^(
5/3)) - (11*a*b^(8/3)*ArcTan[1/Sqrt[3] + (2*b^(1/3)*(Sec[e + f*x]^2)^(1/6))
/(Sqrt[3]*(a^2 + b^2)^(1/6))]*(Sec[e + f*x]^2)^(5/6))/(2*Sqrt[3]*(a^2 + b^2
)^(17/6)*f*(d*Sec[e + f*x])^(5/3)) - (11*a*b^(8/3)*ArcTanh[(b^(1/3)*(Sec[e
+ f*x]^2)^(1/6))/(a^2 + b^2)^(1/6)]*(Sec[e + f*x]^2)^(5/6))/(3*(a^2 + b^2)^
(17/6)*f*(d*Sec[e + f*x])^(5/3)) + (11*a*b^(8/3)*Log[(a^2 + b^2)^(1/3) - b^
(1/3)*(a^2 + b^2)^(1/6)*(Sec[e + f*x]^2)^(1/6) + b^(2/3)*(Sec[e + f*x]^2)^(
1/3)]*(Sec[e + f*x]^2)^(5/6))/(12*(a^2 + b^2)^(17/6)*f*(d*Sec[e + f*x])^(5/
3)) - (11*a*b^(8/3)*Log[(a^2 + b^2)^(1/3) + b^(1/3)*(a^2 + b^2)^(1/6)*(Sec[
e + f*x]^2)^(1/6) + b^(2/3)*(Sec[e + f*x]^2)^(1/3)]*(Sec[e + f*x]^2)^(5/6))
/(12*(a^2 + b^2)^(17/6)*f*(d*Sec[e + f*x])^(5/3)) + (AppellF1[1/2, 2, 11/6,
 3/2, (b^2*Tan[e + f*x]^2)/a^2, -Tan[e + f*x]^2]*(Sec[e + f*x]^2)^(5/6)*Tan
[e + f*x])/(a^2*f*(d*Sec[e + f*x])^(5/3)) + (b^2*AppellF1[3/2, 2, 11/6, 5/2
, (b^2*Tan[e + f*x]^2)/a^2, -Tan[e + f*x]^2]*(Sec[e + f*x]^2)^(5/6)*Tan[e +
 f*x]^3)/(3*a^4*f*(d*Sec[e + f*x])^(5/3)) - (a*b)/((a^2 + b^2)*f*(d*Sec[e +
 f*x])^(5/3)*(a^2 - b^2*Tan[e + f*x]^2))
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 210

```
Int[((a_) + (b_.)*(x_)^(n_))^(-1), x_Symbol] :> Module[{r = Numerator[Rt[-(
a/b), n]], s = Denominator[Rt[-(a/b), n]], k, u}, Simp[u = Int[(r - s*Cos[(
2*k*Pi)/n]*x)/(r^2 - 2*r*s*Cos[(2*k*Pi)/n]*x + s^2*x^2), x] + Int[(r + s*Co
s[(2*k*Pi)/n]*x)/(r^2 + 2*r*s*Cos[(2*k*Pi)/n]*x + s^2*x^2), x]; (2*r^2*Int[
1/(r^2 - s^2*x^2), x])/(a*n) + Dist[(2*r)/(a*n), Sum[u, {k, 1, (n - 2)/4}],
 x], x]] /; FreeQ[{a, b}, x] && IGtQ[(n - 2)/4, 0] && NegQ[a/b]
```

Rule 429

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[a^p*c^q*x*AppellF1[1/n, -p, -q, 1 + 1/n, -((b*x^n)/a), -((d*x^n)/c)
], x] /; FreeQ[{a, b, c, d, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[n, -1]
 && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 510

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> Simp[(a^p*c^q*(e*x)^(m + 1)*AppellF1[(m + 1)/n, -p, -
q, 1 + (m + 1)/n, -((b*x^n)/a), -((d*x^n)/c)])/(e*(m + 1)), x] /; FreeQ[{a,
 b, c, d, e, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] && NeQ[m, n
 - 1] && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 618

```
Int[((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> Dist[-2, Subst[I
nt[1/Simp[b^2 - 4*a*c - x^2, x], x], x, b + 2*c*x], x] /; FreeQ[{a, b, c},
x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 634

```
Int[((d_.) + (e_.)*(x_))/((a_) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> D
ist[(2*c*d - b*e)/(2*c), Int[1/(a + b*x + c*x^2), x], x] + Dist[e/(2*c), In
t[(b + 2*c*x)/(a + b*x + c*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && NeQ
[2*c*d - b*e, 0] && NeQ[b^2 - 4*a*c, 0] &&  !NiceSqrtQ[b^2 - 4*a*c]
```

Rule 757

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Int[E
xpandIntegrand[(a + c*x^2)^p, (d/(d^2 - e^2*x^2) - (e*x)/(d^2 - e^2*x^2))^(
-m), x], x] /; FreeQ[{a, c, d, e, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !Inte
gerQ[p] && ILtQ[m, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{1}{(d\sec(e+fx))^{5/3}(a+b\tan(e+fx))^2}\,dx = \frac{\sec^2(e+fx)^{5/6}\,\text{Subst}\left(\int \frac{1}{(a+x)^2\left(1+\frac{x^2}{b^2}\right)^{11/6}}\,dx, x, b\tan(e+fx)\right)}{bf(d\sec(e+fx))^{5/3}}$$

$$= \frac{\sec^2(e+fx)^{5/6}\,\text{Subst}\left(\int \left(\frac{a^2}{\left(a^2-x^2\right)^2\left(1+\frac{x^2}{b^2}\right)^{11/6}} - \frac{2ax}{\left(a^2-x^2\right)^2\left(1+\frac{x^2}{b^2}\right)^{11/6}} + \right.\right.}{bf(d\sec(e+fx))^{5/3}}$$

$$= \frac{\sec^2(e+fx)^{5/6}\,\text{Subst}\left(\int \frac{x^2}{\left(-a^2+x^2\right)^2\left(1+\frac{x^2}{b^2}\right)^{11/6}}\,dx, x, b\tan(e+fx)\right)}{bf(d\sec(e+fx))^{5/3}}$$

$$= \frac{F_1\left(\frac{1}{2};2,\frac{11}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)\sec^2(e+fx)^{5/6}\tan(e}{a^2f(d\sec(e+fx))^{5/3}}$$

$$= \frac{F_1\left(\frac{1}{2};2,\frac{11}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)\sec^2(e+fx)^{5/6}\tan(e}{a^2f(d\sec(e+fx))^{5/3}}$$

$$= \frac{11ab}{5\left(a^2+b^2\right)^2f(d\sec(e+fx))^{5/3}} + \frac{F_1\left(\frac{1}{2};2,\frac{11}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\mathrm{t}\right.}{a^2f(}$$

$$= \frac{11ab}{5\left(a^2+b^2\right)^2f(d\sec(e+fx))^{5/3}} + \frac{F_1\left(\frac{1}{2};2,\frac{11}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\mathrm{t}\right.}{a^2f(}$$

$$= \frac{11ab}{5\left(a^2+b^2\right)^2f(d\sec(e+fx))^{5/3}} + \frac{F_1\left(\frac{1}{2};2,\frac{11}{6};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\mathrm{t}\right.}{a^2f(}$$

$$= \frac{11ab}{5\left(a^2+b^2\right)^2f(d\sec(e+fx))^{5/3}} - \frac{11ab^{8/3}\tanh^{-1}\left(\frac{\sqrt[3]{b}\,\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}\right.}{3\left(a^2+b^2\right)^{17/6}f(d\sec(}$$

$$= \frac{11ab}{5\left(a^2+b^2\right)^2f(d\sec(e+fx))^{5/3}} - \frac{11ab^{8/3}\tanh^{-1}\left(\frac{\sqrt[3]{b}\,\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}\right.}{3\left(a^2+b^2\right)^{17/6}f(d\sec(}$$

$$= \frac{11ab}{5\left(a^2+b^2\right)^2f(d\sec(e+fx))^{5/3}} + \frac{11ab^{8/3}\tan^{-1}\left(\frac{1-\frac{2\sqrt[3]{b}\,\sqrt[6]{\sec^2(e+fx)}}{\sqrt[6]{a^2+b^2}}}{\sqrt{3}}\right.}{2\sqrt{3}\left(a^2+b^2\right)^{17/6}f(d\,\mathrm{se}}$$

Mathematica [C] time = 27.84, size = 5235, normalized size = 7.30

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/((d*Sec[e + f*x])^(5/3)*(a + b*Tan[e + f*x])^2),x]
[Out] Result too large to show
```

fricas [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(5/3)/(a+b*tan(f*x+e))^2,x, algorithm="fricas")
[Out] Timed out
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}\left(b\tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(5/3)/(a+b*tan(f*x+e))^2,x, algorithm="giac")
[Out] integrate(1/((d*sec(f*x + e))^(5/3)*(b*tan(f*x + e) + a)^2), x)
```

maple [F] time = 1.40, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}\left(a+b\tan\left(fx+e\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d*sec(f*x+e))^(5/3)/(a+b*tan(f*x+e))^2,x)
[Out] int(1/(d*sec(f*x+e))^(5/3)/(a+b*tan(f*x+e))^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(fx+e\right)\right)^{\frac{5}{3}}\left(b\tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))^(5/3)/(a+b*tan(f*x+e))^2,x, algorithm="maxima")
[Out] integrate(1/((d*sec(f*x + e))^(5/3)*(b*tan(f*x + e) + a)^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^{5/3}\,{\left(a+b\,\tan\left(e+f\,x\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((d/cos(e + f*x))^(5/3)*(a + b*tan(e + f*x))^2),x)
[Out] int(1/((d/cos(e + f*x))^(5/3)*(a + b*tan(e + f*x))^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(d\sec\left(e+fx\right)\right)^{\frac{5}{3}}\left(a+b\tan\left(e+fx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d*sec(f*x+e))**(5/3)/(a+b*tan(f*x+e))**2,x)
```

```
[Out] Integral(1/((d*sec(e + f*x))**(5/3)*(a + b*tan(e + f*x))**2), x)
```

3.640 $\int (d\sec(e+fx))^m (a+b\tan(e+fx))^3 \, dx$

Optimal. Leaf size=173

$$-\frac{a\left(3b^2-a^2(m+1)\right)\tan(e+fx)\sec^2(e+fx)^{-m/2}(d\sec(e+fx))^m\,{}_2F_1\left(\frac{1}{2},1-\frac{m}{2};\frac{3}{2};-\tan^2(e+fx)\right)}{f(m+1)}-\frac{b(d\sec(e+\ldots}{}$$

```
[Out] -a*(3*b^2-a^2*(1+m))*hypergeom([1/2, 1-1/2*m],[3/2],-tan(f*x+e)^2)*(d*sec(f
*x+e))^m*tan(f*x+e)/f/(1+m)/((sec(f*x+e)^2)^(1/2*m))+b*(d*sec(f*x+e))^m*(a+
b*tan(f*x+e))^2/f/(2+m)-b*(d*sec(f*x+e))^m*(2*(1+m)*(b^2-a^2*(3+m))-a*b*m*(
4+m)*tan(f*x+e))/f/m/(m^2+3*m+2)
```

Rubi [A] time = 0.20, antiderivative size = 167, normalized size of antiderivative = 0.97, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {3512, 743, 780, 245}

$$\frac{a\left(a^2-\frac{3b^2}{m+1}\right)\tan(e+fx)\sec^2(e+fx)^{-m/2}(d\sec(e+fx))^m\,{}_2F_1\left(\frac{1}{2},1-\frac{m}{2};\frac{3}{2};-\tan^2(e+fx)\right)}{f}-\frac{b(d\sec(e+fx))^m\left(2\ldots\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^3,x]
```

```
[Out] (a*(a^2 - (3*b^2)/(1 + m))*Hypergeometric2F1[1/2, 1 - m/2, 3/2, -Tan[e + f*
x]^2]*(d*Sec[e + f*x])^m*Tan[e + f*x])/(f*(Sec[e + f*x]^2)^(m/2)) + (b*(d*S
ec[e + f*x])^m*(a + b*Tan[e + f*x])^2)/(f*(2 + m)) - (b*(d*Sec[e + f*x])^m*
(2*(1 + m)*(b^2 - a^2*(3 + m)) - a*b*m*(4 + m)*Tan[e + f*x]))/(f*m*(2 + 3*m
 + m^2))
```

Rule 245

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p*x*Hypergeometric2F
1[-p, 1/n, 1/n + 1, -((b*x^n)/a)], x] /; FreeQ[{a, b, n, p}, x] &&  !IGtQ[p
, 0] &&  !IntegerQ[1/n] &&  !ILtQ[Simplify[1/n + p], 0] && (IntegerQ[p] ||
GtQ[a, 0])
```

Rule 743

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m - 1)*(a + c*x^2)^(p + 1))/(c*(m + 2*p + 1)), x] + Dist[1/(c
*(m + 2*p + 1)), Int[(d + e*x)^(m - 2)*Simp[c*d^2*(m + 2*p + 1) - a*e^2*(m
- 1) + 2*c*d*e*(m + p)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m,
 p}, x] && NeQ[c*d^2 + a*e^2, 0] && If[RationalQ[m], GtQ[m, 1], SumSimplerQ
[m, -2]] && NeQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 780

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[(((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*(a + c*x^2)^(p
+ 1))/(2*c*(p + 1)*(2*p + 3)), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
```

```
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int (d\sec(e+fx))^m(a+b\tan(e+fx))^3\,dx = \frac{\left((d\sec(e+fx))^m\sec^2(e+fx)^{-m/2}\right)\text{Subst}\left(\int (a+x)^3\left(1+\frac{x^2}{b^2}\right)^{-1+}\right.}{bf}$$

$$= \frac{b(d\sec(e+fx))^m(a+b\tan(e+fx))^2}{f(2+m)} + \frac{\left(b(d\sec(e+fx))^m\sec^2(\right.}{}$$

$$= \frac{b(d\sec(e+fx))^m(a+b\tan(e+fx))^2}{f(2+m)} - \frac{b(d\sec(e+fx))^m\left(2(1+\right.}{}$$

$$= -\frac{a\left(3b^2-a^2(1+m)\right)\,{}_2F_1\left(\frac{1}{2},1-\frac{m}{2};\frac{3}{2};-\tan^2(e+fx)\right)(d\sec(e+}{f(1+m)}$$

Mathematica [A] time = 6.45, size = 334, normalized size = 1.93

$$\frac{a\left(a^2-3b^2\right)\sin(e+fx)\cos^4(e+fx)\cos^2(e+fx)^{\frac{m}{2}-\frac{1}{2}}(a+b\tan(e+fx))^3(d\sec(e+fx))^m\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{3}{2};\sin^2\right.}{f(a\cos(e+fx)+b\sin(e+fx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^3,x]
```

```
[Out] (b^3*Cos[e + f*x]*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^3)/(f*(2 + m)*(a*
Cos[e + f*x] + b*Sin[e + f*x])^3) - (b*(-3*a^2 + b^2)*Cos[e + f*x]^3*(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^3)/(f*m*(a*Cos[e + f*x] + b*Sin[e + f*x])
^3) + (a*(a^2 - 3*b^2)*Cos[e + f*x]^4*(Cos[e + f*x]^2)^(-1/2 + m/2)*Hyperge
ometric2F1[1/2, (1 + m)/2, 3/2, Sin[e + f*x]^2]*(d*Sec[e + f*x])^m*Sin[e +
f*x]*(a + b*Tan[e + f*x])^3)/(f*(a*Cos[e + f*x] + b*Sin[e + f*x])^3) + (3*a
*b^2*(Cos[e + f*x]^2)^(1/2 + (2 + m)/2)*Hypergeometric2F1[1/2, (3 + m)/2, 3
/2, Sin[e + f*x]^2]*(d*Sec[e + f*x])^m*Sin[e + f*x]*(a + b*Tan[e + f*x])^3)
/(f*(a*Cos[e + f*x] + b*Sin[e + f*x])^3)
```

fricas [F] time = 0.60, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(b^3\tan\left(fx+e\right)^3+3\,ab^2\tan\left(fx+e\right)^2+3\,a^2b\tan\left(fx+e\right)+a^3\right)\left(d\sec\left(fx+e\right)\right)^m,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^m*(a+b*tan(f*x+e))^3,x, algorithm="fricas")
```

```
[Out] integral((b^3*tan(f*x + e)^3 + 3*a*b^2*tan(f*x + e)^2 + 3*a^2*b*tan(f*x + e
) + a^3)*(d*sec(f*x + e))^m, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(b\tan\left(fx+e\right)+a\right)^3\left(d\sec\left(fx+e\right)\right)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^m*(a+b*tan(f*x+e))^3,x, algorithm="giac")
[Out] integrate((b*tan(f*x + e) + a)^3*(d*sec(f*x + e))^m, x)
```

maple [F] time = 1.42, size = 0, normalized size = 0.00

$$\int \left(d \sec \left(f x + e\right)\right)^{m} \left(a + b \tan \left(f x + e\right)\right)^{3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^m*(a+b*tan(f*x+e))^3,x)
[Out] int((d*sec(f*x+e))^m*(a+b*tan(f*x+e))^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(b \tan \left(f x + e\right) + a\right)^{3} \left(d \sec \left(f x + e\right)\right)^{m} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^m*(a+b*tan(f*x+e))^3,x, algorithm="maxima")
[Out] integrate((b*tan(f*x + e) + a)^3*(d*sec(f*x + e))^m, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(\frac{d}{\cos\left(e+f\,x\right)}\right)}^m\,{\left(a+b\,\tan\left(e+f\,x\right)\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^m*(a + b*tan(e + f*x))^3,x)
[Out] int((d/cos(e + f*x))^m*(a + b*tan(e + f*x))^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d \sec {\left (e + f x \right)}\right)^{m} \left(a + b \tan {\left (e + f x \right)}\right)^{3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**m*(a+b*tan(f*x+e))**3,x)
[Out] Integral((d*sec(e + f*x))**m*(a + b*tan(e + f*x))**3, x)
```

3.641 $\int (d\sec(e+fx))^m (a+b\tan(e+fx))^2\,dx$

Optimal. Leaf size=147

$$\frac{d\left(b^2-a^2(m+1)\right)\sin(e+fx)(d\sec(e+fx))^{m-1}\,{}_2F_1\left(\frac{1}{2},\frac{1-m}{2};\frac{3-m}{2};\cos^2(e+fx)\right)}{f(1-m)(m+1)\sqrt{\sin^2(e+fx)}}+\frac{ab(m+2)(d\sec(e+fx))^m}{fm(m+1)}+$$

```
[Out] a*b*(2+m)*(d*sec(f*x+e))^m/f/m/(1+m)+d*(b^2-a^2*(1+m))*hypergeom([1/2, 1/2-
1/2*m],[3/2-1/2*m],cos(f*x+e)^2)*(d*sec(f*x+e))^(-1+m)*sin(f*x+e)/f/(-m^2+1
)/(sin(f*x+e)^2)^(1/2)+b*(d*sec(f*x+e))^m*(a+b*tan(f*x+e))/f/(1+m)
```

Rubi [A] time = 0.17, antiderivative size = 147, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {3508, 3486, 3772, 2643}

$$\frac{d\left(b^2-a^2(m+1)\right)\sin(e+fx)(d\sec(e+fx))^{m-1}\,{}_2F_1\left(\frac{1}{2},\frac{1-m}{2};\frac{3-m}{2};\cos^2(e+fx)\right)}{f(1-m)(m+1)\sqrt{\sin^2(e+fx)}}+\frac{ab(m+2)(d\sec(e+fx))^m}{fm(m+1)}+$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^2,x]
```

```
[Out] (a*b*(2 + m)*(d*Sec[e + f*x])^m)/(f*m*(1 + m)) + (d*(b^2 - a^2*(1 + m))*Hyp
ergeometric2F1[1/2, (1 - m)/2, (3 - m)/2, Cos[e + f*x]^2]*(d*Sec[e + f*x])^
(-1 + m)*Sin[e + f*x])/(f*(1 - m)*(1 + m)*Sqrt[Sin[e + f*x]^2]) + (b*(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(1 + m))
```

Rule 2643

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Sin[c + d*x])^(n + 1)*Hypergeometric2F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c
+ d*x]^2])/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]), x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3508

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^2, x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(
m + 1)), x] + Dist[1/(m + 1), Int[(d*Sec[e + f*x])^m*(a^2*(m + 1) - b^2 + a
*b*(m + 2)*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, m}, x] && NeQ[a^2
 + b^2, 0] && NeQ[m, -1]
```

Rule 3772

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(b*Csc[c + d*x]
)^(n - 1)*((Sin[c + d*x]/b)^(n - 1)*Int[1/(Sin[c + d*x]/b)^n, x]), x] /; Fr
eeQ[{b, c, d, n}, x] && !IntegerQ[n]
```

Rubi steps

$$\int (d\sec(e+fx))^m(a+b\tan(e+fx))^2\,dx = \frac{b(d\sec(e+fx))^m(a+b\tan(e+fx))}{f(1+m)} + \frac{\int (d\sec(e+fx))^m\left(-b^2+a^2(\right.}{}$$
$$= \frac{ab(2+m)(d\sec(e+fx))^m}{fm(1+m)} + \frac{b(d\sec(e+fx))^m(a+b\tan(e+fx))}{f(1+m)} +$$
$$= \frac{ab(2+m)(d\sec(e+fx))^m}{fm(1+m)} + \frac{b(d\sec(e+fx))^m(a+b\tan(e+fx))}{f(1+m)} +$$
$$= \frac{ab(2+m)(d\sec(e+fx))^m}{fm(1+m)} - \frac{\left(a^2-\frac{b^2}{1+m}\right)\cos(e+fx)\,{}_2F_1\left(\frac{1}{2},\frac{1-m}{2};\frac{3-}{2}\right.}{f(1-m)}$$

Mathematica [C] time = 26.50, size = 11095, normalized size = 75.48

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^2,x]
```

```
[Out] Result too large to show
```

fricas [F] time = 0.59, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(b^2\tan\left(fx+e\right)^2+2\,ab\tan\left(fx+e\right)+a^2\right)\left(d\sec\left(fx+e\right)\right)^m,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^m*(a+b*tan(f*x+e))^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*tan(f*x + e)^2 + 2*a*b*tan(f*x + e) + a^2)*(d*sec(f*x + e))^m
, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(b\tan\left(fx+e\right)+a\right)^2\left(d\sec\left(fx+e\right)\right)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^m*(a+b*tan(f*x+e))^2,x, algorithm="giac")
```

```
[Out] integrate((b*tan(f*x + e) + a)^2*(d*sec(f*x + e))^m, x)
```

maple [F] time = 1.04, size = 0, normalized size = 0.00

$$\int\left(d\sec\left(fx+e\right)\right)^m\left(a+b\tan\left(fx+e\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^m*(a+b*tan(f*x+e))^2,x)
```

```
[Out] int((d*sec(f*x+e))^m*(a+b*tan(f*x+e))^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(b\tan\left(fx+e\right)+a\right)^2\left(d\sec\left(fx+e\right)\right)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^m*(a+b*tan(f*x+e))^2,x, algorithm="maxima")
[Out] integrate((b*tan(f*x + e) + a)^2*(d*sec(f*x + e))^m, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \left(\frac{d}{\cos\left(e+f\,x\right)}\right)^m\,\left(a+b\,\tan\left(e+f\,x\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^m*(a + b*tan(e + f*x))^2,x)
[Out] int((d/cos(e + f*x))^m*(a + b*tan(e + f*x))^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(e+fx\right)\right)^m\left(a+b\tan\left(e+fx\right)\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**m*(a+b*tan(f*x+e))**2,x)
[Out] Integral((d*sec(e + f*x))**m*(a + b*tan(e + f*x))**2, x)
```

3.642 $\int (d\sec(e+fx))^m(a+b\tan(e+fx))\,dx$

Optimal. Leaf size=93

$$\frac{b(d\sec(e+fx))^m}{fm}-\frac{ad\sin(e+fx)(d\sec(e+fx))^{m-1}\,{}_2F_1\left(\frac{1}{2},\frac{1-m}{2};\frac{3-m}{2};\cos^2(e+fx)\right)}{f(1-m)\sqrt{\sin^2(e+fx)}}$$

```
[Out] b*(d*sec(f*x+e))^m/f/m-a*d*hypergeom([1/2, 1/2-1/2*m],[3/2-1/2*m],cos(f*x+e
)^2)*(d*sec(f*x+e))^(-1+m)*sin(f*x+e)/f/(1-m)/(sin(f*x+e)^2)^(1/2)
```

Rubi [A] time = 0.06, antiderivative size = 93, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3486, 3772, 2643}

$$\frac{b(d\sec(e+fx))^m}{fm}-\frac{ad\sin(e+fx)(d\sec(e+fx))^{m-1}\,{}_2F_1\left(\frac{1}{2},\frac{1-m}{2};\frac{3-m}{2};\cos^2(e+fx)\right)}{f(1-m)\sqrt{\sin^2(e+fx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]),x]
```

```
[Out] (b*(d*Sec[e + f*x])^m)/(f*m) - (a*d*Hypergeometric2F1[1/2, (1 - m)/2, (3 -
m)/2, Cos[e + f*x]^2]*(d*Sec[e + f*x])^(-1 + m)*Sin[e + f*x])/(f*(1 - m)*Sq
rt[Sin[e + f*x]^2])
```

Rule 2643

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Sin[c + d*x])^(n + 1)*Hypergeometric2F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c
+ d*x]^2])/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]), x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3772

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(b*Csc[c + d*x]
)^(n - 1)*((Sin[c + d*x]/b)^(n - 1)*Int[1/(Sin[c + d*x]/b)^n, x]), x] /; Fr
eeQ[{b, c, d, n}, x] && !IntegerQ[n]
```

Rubi steps

$$\begin{aligned}\int (d\sec(e+fx))^m(a+b\tan(e+fx))\,dx &= \frac{b(d\sec(e+fx))^m}{fm}+a\int (d\sec(e+fx))^m\,dx\\ &= \frac{b(d\sec(e+fx))^m}{fm}+\left(a\left(\frac{\cos(e+fx)}{d}\right)^m(d\sec(e+fx))^m\right)\int\left(\frac{\cos(e+}{d}\right.\\ &= \frac{b(d\sec(e+fx))^m}{fm}-\frac{a\cos(e+fx)\,{}_2F_1\left(\frac{1}{2},\frac{1-m}{2};\frac{3-m}{2};\cos^2(e+fx)\right)(d\,s}{f(1-m)\sqrt{\sin^2(e+fx)}}\end{aligned}$$

Mathematica [C] time = 16.80, size = 3302, normalized size = 35.51

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]),x]
```

```
[Out] -((Sec[e + f*x]^(-1 - m)*(d*Sec[e + f*x])^m*(Cos[(e + f*x)/2]^2*Sec[e + f*x
])^m*(a*Sec[e + f*x]^m + b*Sec[e + f*x]^(1 + m)*Sin[e + f*x])*Tan[(e + f*x)
/2]*(-(b*AppellF1[1, m, 1 - m, 2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2]*
(Cos[e + f*x]*Sec[(e + f*x)/2]^2)^m*Tan[(e + f*x)/2]) - b*AppellF1[1, 1 + m
, -m, 2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2]*(Cos[e + f*x]*Sec[(e + f*
x)/2]^2)^m*Tan[(e + f*x)/2] - (6*a*AppellF1[1/2, m, 1 - m, 3/2, Tan[(e + f*
x)/2]^2, -Tan[(e + f*x)/2]^2]*(Sec[(e + f*x)/2]^2)^(-1 + m))/(3*AppellF1[1/
2, m, 1 - m, 3/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2] + 2*((-1 + m)*Ap
pellF1[3/2, m, 2 - m, 5/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2] + m*App
ellF1[3/2, 1 + m, 1 - m, 5/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2])*Tan
[(e + f*x)/2]^2))*(a + b*Tan[e + f*x]))/(f*(a*Cos[e + f*x] + b*Sin[e + f*x]
)*(-1/2*(Sec[(e + f*x)/2]^2*(Cos[(e + f*x)/2]^2*Sec[e + f*x])^m*(-(b*Appell
F1[1, m, 1 - m, 2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2]*(Cos[e + f*x]*S
ec[(e + f*x)/2]^2)^m*Tan[(e + f*x)/2]) - b*AppellF1[1, 1 + m, -m, 2, Tan[(e
 + f*x)/2]^2, -Tan[(e + f*x)/2]^2]*(Cos[e + f*x]*Sec[(e + f*x)/2]^2)^m*Tan[
(e + f*x)/2] - (6*a*AppellF1[1/2, m, 1 - m, 3/2, Tan[(e + f*x)/2]^2, -Tan[(
e + f*x)/2]^2]*(Sec[(e + f*x)/2]^2)^(-1 + m))/(3*AppellF1[1/2, m, 1 - m, 3/
2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2] + 2*((-1 + m)*AppellF1[3/2, m,
2 - m, 5/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2] + m*AppellF1[3/2, 1 +
m, 1 - m, 5/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2])*Tan[(e + f*x)/2]^2
))) - (Cos[(e + f*x)/2]^2*Sec[e + f*x])^m*Tan[(e + f*x)/2]*(-1/2*(b*AppellF
1[1, m, 1 - m, 2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2]*Sec[(e + f*x)/2]
^2*(Cos[e + f*x]*Sec[(e + f*x)/2]^2)^m) - (b*AppellF1[1, 1 + m, -m, 2, Tan[
(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2]*Sec[(e + f*x)/2]^2*(Cos[e + f*x]*Sec[(
e + f*x)/2]^2)^m)/2 - b*(Cos[e + f*x]*Sec[(e + f*x)/2]^2)^m*Tan[(e + f*x)/2
]*(-1/2*((1 - m)*AppellF1[2, m, 2 - m, 3, Tan[(e + f*x)/2]^2, -Tan[(e + f*x
)/2]^2]*Sec[(e + f*x)/2]^2*Tan[(e + f*x)/2]) + (m*AppellF1[2, 1 + m, 1 - m,
 3, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2]*Sec[(e + f*x)/2]^2*Tan[(e + f*
x)/2])/2) - b*(Cos[e + f*x]*Sec[(e + f*x)/2]^2)^m*Tan[(e + f*x)/2]*((m*Appe
llF1[2, 1 + m, 1 - m, 3, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2]*Sec[(e +
f*x)/2]^2*Tan[(e + f*x)/2])/2 + ((1 + m)*AppellF1[2, 2 + m, -m, 3, Tan[(e +
 f*x)/2]^2, -Tan[(e + f*x)/2]^2]*Sec[(e + f*x)/2]^2*Tan[(e + f*x)/2])/2) -
b*m*AppellF1[1, m, 1 - m, 2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2]*(Cos[
e + f*x]*Sec[(e + f*x)/2]^2)^(-1 + m)*Tan[(e + f*x)/2]*(-(Sec[(e + f*x)/2]^
2*Sin[e + f*x]) + Cos[e + f*x]*Sec[(e + f*x)/2]^2*Tan[(e + f*x)/2]) - b*m*A
ppellF1[1, 1 + m, -m, 2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2]*(Cos[e +
f*x]*Sec[(e + f*x)/2]^2)^(-1 + m)*Tan[(e + f*x)/2]*(-(Sec[(e + f*x)/2]^2*Si
n[e + f*x]) + Cos[e + f*x]*Sec[(e + f*x)/2]^2*Tan[(e + f*x)/2]) - (6*a*(-1
+ m)*AppellF1[1/2, m, 1 - m, 3/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2]*
(Sec[(e + f*x)/2]^2)^(-1 + m)*Tan[(e + f*x)/2])/(3*AppellF1[1/2, m, 1 - m,
3/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2] + 2*((-1 + m)*AppellF1[3/2, m
, 2 - m, 5/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2] + m*AppellF1[3/2, 1
+ m, 1 - m, 5/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2])*Tan[(e + f*x)/2]
^2) - (6*a*(Sec[(e + f*x)/2]^2)^(-1 + m)*(-1/3*((1 - m)*AppellF1[3/2, m, 2
- m, 5/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2]*Sec[(e + f*x)/2]^2*Tan[(
e + f*x)/2]) + (m*AppellF1[3/2, 1 + m, 1 - m, 5/2, Tan[(e + f*x)/2]^2, -Tan
[(e + f*x)/2]^2]*Sec[(e + f*x)/2]^2*Tan[(e + f*x)/2])/3))/(3*AppellF1[1/2,
m, 1 - m, 3/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2] + 2*((-1 + m)*Appel
lF1[3/2, m, 2 - m, 5/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2] + m*Appell
F1[3/2, 1 + m, 1 - m, 5/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2])*Tan[(e
 + f*x)/2]^2) + (6*a*AppellF1[1/2, m, 1 - m, 3/2, Tan[(e + f*x)/2]^2, -Tan[
(e + f*x)/2]^2]*(Sec[(e + f*x)/2]^2)^(-1 + m)*(2*((-1 + m)*AppellF1[3/2, m,
```

```
2 - m, 5/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2] + m*AppellF1[3/2, 1 +
m, 1 - m, 5/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2])*Sec[(e + f*x)/2]^
2*Tan[(e + f*x)/2] + 3*(-1/3*((1 - m)*AppellF1[3/2, m, 2 - m, 5/2, Tan[(e +
f*x)/2]^2, -Tan[(e + f*x)/2]^2]*Sec[(e + f*x)/2]^2*Tan[(e + f*x)/2]) + (m*
AppellF1[3/2, 1 + m, 1 - m, 5/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2]*S
ec[(e + f*x)/2]^2*Tan[(e + f*x)/2])/3) + 2*Tan[(e + f*x)/2]^2*((-1 + m)*((-
3*(2 - m)*AppellF1[5/2, m, 3 - m, 7/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2
]^2]*Sec[(e + f*x)/2]^2*Tan[(e + f*x)/2])/5 + (3*m*AppellF1[5/2, 1 + m, 2 -
m, 7/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2]*Sec[(e + f*x)/2]^2*Tan[(e
+ f*x)/2])/5) + m*((-3*(1 - m)*AppellF1[5/2, 1 + m, 2 - m, 7/2, Tan[(e + f
*x)/2]^2, -Tan[(e + f*x)/2]^2]*Sec[(e + f*x)/2]^2*Tan[(e + f*x)/2])/5 + (3*
(1 + m)*AppellF1[5/2, 2 + m, 1 - m, 7/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)
/2]^2]*Sec[(e + f*x)/2]^2*Tan[(e + f*x)/2])/5))))/(3*AppellF1[1/2, m, 1 - m
, 3/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2] + 2*((-1 + m)*AppellF1[3/2,
m, 2 - m, 5/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2] + m*AppellF1[3/2,
1 + m, 1 - m, 5/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2])*Tan[(e + f*x)/
2]^2)^2) - m*(Cos[(e + f*x)/2]^2*Sec[e + f*x])^(-1 + m)*Tan[(e + f*x)/2]*(-
(b*AppellF1[1, m, 1 - m, 2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2]*(Cos[e
+ f*x]*Sec[(e + f*x)/2]^2)^m*Tan[(e + f*x)/2]) - b*AppellF1[1, 1 + m, -m,
2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2]*(Cos[e + f*x]*Sec[(e + f*x)/2]^
2)^m*Tan[(e + f*x)/2] - (6*a*AppellF1[1/2, m, 1 - m, 3/2, Tan[(e + f*x)/2]^
2, -Tan[(e + f*x)/2]^2]*(Sec[(e + f*x)/2]^2)^(-1 + m))/(3*AppellF1[1/2, m,
1 - m, 3/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2] + 2*((-1 + m)*AppellF1
[3/2, m, 2 - m, 5/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2] + m*AppellF1[
3/2, 1 + m, 1 - m, 5/2, Tan[(e + f*x)/2]^2, -Tan[(e + f*x)/2]^2])*Tan[(e +
f*x)/2]^2))*(-(Cos[(e + f*x)/2]*Sec[e + f*x]*Sin[(e + f*x)/2]) + Cos[(e + f
*x)/2]^2*Sec[e + f*x]*Tan[e + f*x]))))
```

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(b\tan\left(fx+e\right)+a\right)\left(d\sec\left(fx+e\right)\right)^{m},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^m*(a+b*tan(f*x+e)),x, algorithm="fricas")
```

```
[Out] integral((b*tan(f*x + e) + a)*(d*sec(f*x + e))^m, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(b\tan\left(fx+e\right)+a\right)\left(d\sec\left(fx+e\right)\right)^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^m*(a+b*tan(f*x+e)),x, algorithm="giac")
```

```
[Out] integrate((b*tan(f*x + e) + a)*(d*sec(f*x + e))^m, x)
```

maple [F] time = 1.60, size = 0, normalized size = 0.00

$$\int\left(d\sec\left(fx+e\right)\right)^{m}\left(a+b\tan\left(fx+e\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^m*(a+b*tan(f*x+e)),x)
```

```
[Out] int((d*sec(f*x+e))^m*(a+b*tan(f*x+e)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(b\tan\left(fx+e\right)+a\right)\left(d\sec\left(fx+e\right)\right)^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^m*(a+b*tan(f*x+e)),x, algorithm="maxima")
```

```
[Out] integrate((b*tan(f*x + e) + a)*(d*sec(f*x + e))^m, x)
```

mupad [F]   time = 0.00, size = -1, normalized size = -0.01

$$\int \left(\frac{d}{\cos\left(e+f\,x\right)}\right)^m\,\left(a+b\tan\left(e+f\,x\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^m*(a + b*tan(e + f*x)),x)
```

```
[Out] int((d/cos(e + f*x))^m*(a + b*tan(e + f*x)), x)
```

sympy [F]   time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(e+fx\right)\right)^m\left(a+b\tan\left(e+fx\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**m*(a+b*tan(f*x+e)),x)
```

```
[Out] Integral((d*sec(e + f*x))**m*(a + b*tan(e + f*x)), x)
```

3.643 $\int \frac{(d\sec(e+fx))^m}{a+b\tan(e+fx)}\,dx$

Optimal. Leaf size=141

$$\frac{\tan(e+fx)\sec^2(e+fx)^{-m/2}(d\sec(e+fx))^m F_1\left(\frac{1}{2};1,1-\frac{m}{2};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{af}-\frac{b(d\sec(e+fx))^m\,{}_2F}{fm(}$$

```
[Out] -b*hypergeom([1, 1/2*m],[1+1/2*m],b^2*sec(f*x+e)^2/(a^2+b^2))*(d*sec(f*x+e)
)^m/(a^2+b^2)/f/m+AppellF1(1/2,1,1-1/2*m,3/2,b^2*tan(f*x+e)^2/a^2,-tan(f*x+
e)^2)*(d*sec(f*x+e))^m*tan(f*x+e)/a/f/((sec(f*x+e)^2)^(1/2*m))
```

Rubi [A] time = 0.16, antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {3512, 757, 429, 444, 68}

$$\frac{\tan(e+fx)\sec^2(e+fx)^{-m/2}(d\sec(e+fx))^m F_1\left(\frac{1}{2};1,1-\frac{m}{2};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{af}-\frac{b(d\sec(e+fx))^m\,{}_2F}{fm(}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^m/(a + b*Tan[e + f*x]),x]
```

```
[Out] -((b*Hypergeometric2F1[1, m/2, (2 + m)/2, (b^2*Sec[e + f*x]^2)/(a^2 + b^2)]
*(d*Sec[e + f*x])^m)/((a^2 + b^2)*f*m)) + (AppellF1[1/2, 1, 1 - m/2, 3/2, (
b^2*Tan[e + f*x]^2)/a^2, -Tan[e + f*x]^2]*(d*Sec[e + f*x])^m*Tan[e + f*x])/
(a*f*(Sec[e + f*x]^2)^(m/2))
```

Rule 68

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a
+ b*x))/(b*c - a*d))])/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]
 && NeQ[b*c - a*d, 0] &&  !IntegerQ[m] && IntegerQ[n]
```

Rule 429

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[a^p*c^q*x*AppellF1[1/n, -p, -q, 1 + 1/n, -((b*x^n)/a), -((d*x^n)/c)
], x] /; FreeQ[{a, b, c, d, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[n, -1]
 && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 757

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Int[E
xpandIntegrand[(a + c*x^2)^p, (d/(d^2 - e^2*x^2) - (e*x)/(d^2 - e^2*x^2))^(
-m), x], x] /; FreeQ[{a, c, d, e, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !Inte
gerQ[p] && ILtQ[m, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] && !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{(d\sec(e+fx))^m}{a+b\tan(e+fx)}\,dx = \frac{\left((d\sec(e+fx))^m \sec^2(e+fx)^{-m/2}\right)\text{Subst}\left(\int \frac{\left(1+\frac{x^2}{b^2}\right)^{-1+\frac{m}{2}}}{a+x}\,dx, x, b\tan(e+fx)\right)}{bf}$$

$$= \frac{\left((d\sec(e+fx))^m \sec^2(e+fx)^{-m/2}\right)\text{Subst}\left(\int \left(\frac{a\left(1+\frac{x^2}{b^2}\right)^{-1+\frac{m}{2}}}{a^2-x^2} + \frac{x\left(1+\frac{x^2}{b^2}\right)^{-1+\frac{m}{2}}}{-a^2+x^2}\right) dx, x, b\,\text{ta}\right.}{bf}$$

$$= \frac{\left((d\sec(e+fx))^m \sec^2(e+fx)^{-m/2}\right)\text{Subst}\left(\int \frac{x\left(1+\frac{x^2}{b^2}\right)^{-1+\frac{m}{2}}}{-a^2+x^2}\,dx, x, b\tan(e+fx)\right)}{bf} + \frac{(a}{}$$

$$= \frac{F_1\left(\frac{1}{2};1,1-\frac{m}{2};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)(d\sec(e+fx))^m \sec^2(e+fx)^{-m/2}\tan}{af}$$

$$= -\frac{b\,{}_2F_1\left(1,\frac{m}{2};\frac{2+m}{2};\frac{b^2\sec^2(e+fx)}{a^2+b^2}\right)(d\sec(e+fx))^m}{\left(a^2+b^2\right)fm} + \frac{F_1\left(\frac{1}{2};1,1-\frac{m}{2};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\text{ta}\right.}{}$$

Mathematica [C] time = 15.05, size = 1158, normalized size = 8.21

$$\frac{}{f(a+b\tan(e+fx))\left(-\frac{1}{2}bmF_1\left(-m;-\frac{m}{2},-\frac{m}{2};1-m;\frac{a-ib}{a+b\tan(e+fx)},\frac{a+ib}{a+b\tan(e+fx)}\right)\sec^2(e+fx)^{m/2}\left(\frac{b(\tan(e+fx)+i)}{a+b\tan(e+fx)}\right)^{-m}\right.}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Sec[e + f*x])^m/(a + b*Tan[e + f*x]),x]
```

```
[Out] ((d*Sec[e + f*x])^m*(b - b*(Sec[e + f*x]^2)^(m/2) + a*m*Hypergeometric2F1[1
/2, 1 - m/2, 3/2, -Tan[e + f*x]^2]*Tan[e + f*x] + (b*AppellF1[-m, -1/2*m, -
1/2*m, 1 - m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x]
)]*(Sec[e + f*x]^2)^(m/2))/(((b*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^
(m/2)*((b*(I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2))))/(f*(a + b*Tan[
e + f*x])*(a*m*Hypergeometric2F1[1/2, 1 - m/2, 3/2, -Tan[e + f*x]^2]*Sec[e
+ f*x]^2 - b*m*(Sec[e + f*x]^2)^(m/2)*Tan[e + f*x] + (b*m*AppellF1[-m, -1/2
*m, -1/2*m, 1 - m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e +
 f*x])]*(Sec[e + f*x]^2)^(m/2)*Tan[e + f*x])/(((b*(-I + Tan[e + f*x]))/(a +
 b*Tan[e + f*x]))^(m/2)*((b*(I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)
) + (b*(Sec[e + f*x]^2)^(m/2)*(-1/2*((a - I*b)*b*m^2*AppellF1[1 - m, 1 - m/
2, -1/2*m, 2 - m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e +
```

```
f*x])]*Sec[e + f*x]^2)/((1 - m)*(a + b*Tan[e + f*x])^2) - ((a + I*b)*b*m^2*
AppellF1[1 - m, -1/2*m, 1 - m/2, 2 - m, (a - I*b)/(a + b*Tan[e + f*x]), (a
+ I*b)/(a + b*Tan[e + f*x])]*Sec[e + f*x]^2)/(2*(1 - m)*(a + b*Tan[e + f*x]
)^2)))/(((b*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*((b*(I + Tan[e
 + f*x]))/(a + b*Tan[e + f*x]))^(m/2)) - (b*m*AppellF1[-m, -1/2*m, -1/2*m,
1 - m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])]*(Sec
[e + f*x]^2)^(m/2)*((b*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(-1 - m/2
)*(-((b^2*Sec[e + f*x]^2*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x])^2) + (b*
Sec[e + f*x]^2)/(a + b*Tan[e + f*x])))/(2*((b*(I + Tan[e + f*x]))/(a + b*Ta
n[e + f*x]))^(m/2)) - (b*m*AppellF1[-m, -1/2*m, -1/2*m, 1 - m, (a - I*b)/(a
 + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])]*(Sec[e + f*x]^2)^(m/2)*
((b*(I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(-1 - m/2)*(-((b^2*Sec[e + f*
x]^2*(I + Tan[e + f*x]))/(a + b*Tan[e + f*x])^2) + (b*Sec[e + f*x]^2)/(a +
b*Tan[e + f*x])))/(2*((b*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2))
+ a*m*Sec[e + f*x]^2*(-Hypergeometric2F1[1/2, 1 - m/2, 3/2, -Tan[e + f*x]^2
] + (1 + Tan[e + f*x]^2)^(-1 + m/2))))
```

fricas [F] time = 0.59, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(d\sec\left(fx+e\right)\right)^m}{b\tan\left(fx+e\right)+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^m/(a+b*tan(f*x+e)),x, algorithm="fricas")
[Out] integral((d*sec(f*x + e))^m/(b*tan(f*x + e) + a), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(d\sec\left(fx+e\right)\right)^m}{b\tan\left(fx+e\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^m/(a+b*tan(f*x+e)),x, algorithm="giac")
[Out] integrate((d*sec(f*x + e))^m/(b*tan(f*x + e) + a), x)
```

maple [F] time = 1.26, size = 0, normalized size = 0.00

$$\int\frac{\left(d\sec\left(fx+e\right)\right)^m}{a+b\tan\left(fx+e\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^m/(a+b*tan(f*x+e)),x)
[Out] int((d*sec(f*x+e))^m/(a+b*tan(f*x+e)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(d\sec\left(fx+e\right)\right)^m}{b\tan\left(fx+e\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^m/(a+b*tan(f*x+e)),x, algorithm="maxima")
[Out] integrate((d*sec(f*x + e))^m/(b*tan(f*x + e) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^m}{a+b\tan\left(e+f\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^m/(a + b*tan(e + f*x)),x)
[Out] int((d/cos(e + f*x))^m/(a + b*tan(e + f*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\sec\left(e+fx\right)\right)^m}{a+b\tan\left(e+fx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**m/(a+b*tan(f*x+e)),x)
[Out] Integral((d*sec(e + f*x))**m/(a + b*tan(e + f*x)), x)
```

3.644 $\int \frac{(d\sec(e+fx))^m}{(a+b\tan(e+fx))^2}\,dx$

Optimal. Leaf size=227

$$\frac{\tan(e+fx)\sec^2(e+fx)^{-m/2}(d\sec(e+fx))^m F_1\left(\frac{1}{2};2,1-\frac{m}{2};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{a^2 f}-\frac{2ab(d\sec(e+fx))^m}{fm}$$

```
[Out] -2*a*b*hypergeom([2, 1/2*m],[1+1/2*m],b^2*sec(f*x+e)^2/(a^2+b^2))*(d*sec(f*
x+e))^m/(a^2+b^2)^2/f/m+AppellF1(1/2,2,1-1/2*m,3/2,b^2*tan(f*x+e)^2/a^2,-ta
n(f*x+e)^2)*(d*sec(f*x+e))^m*tan(f*x+e)/a^2/f/((sec(f*x+e)^2)^(1/2*m))+1/3*
b^2*AppellF1(3/2,2,1-1/2*m,5/2,b^2*tan(f*x+e)^2/a^2,-tan(f*x+e)^2)*(d*sec(f
*x+e))^m*tan(f*x+e)^3/a^4/f/((sec(f*x+e)^2)^(1/2*m))
```

Rubi [A] time = 0.20, antiderivative size = 227, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {3512, 757, 429, 444, 68, 510}

$$\frac{b^2\tan^3(e+fx)\sec^2(e+fx)^{-m/2}(d\sec(e+fx))^m F_1\left(\frac{3}{2};2,1-\frac{m}{2};\frac{5}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{3a^4 f}+\frac{\tan(e+fx)\sec^2(}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Sec[e + f*x])^m/(a + b*Tan[e + f*x])^2,x]
```

```
[Out] (-2*a*b*Hypergeometric2F1[2, m/2, (2 + m)/2, (b^2*Sec[e + f*x]^2)/(a^2 + b^
2)]*(d*Sec[e + f*x])^m)/((a^2 + b^2)^2*f*m) + (AppellF1[1/2, 2, 1 - m/2, 3/
2, (b^2*Tan[e + f*x]^2)/a^2, -Tan[e + f*x]^2]*(d*Sec[e + f*x])^m*Tan[e + f*
x])/(a^2*f*(Sec[e + f*x]^2)^(m/2)) + (b^2*AppellF1[3/2, 2, 1 - m/2, 5/2, (b
^2*Tan[e + f*x]^2)/a^2, -Tan[e + f*x]^2]*(d*Sec[e + f*x])^m*Tan[e + f*x]^3)
/(3*a^4*f*(Sec[e + f*x]^2)^(m/2))
```

Rule 68

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a
+ b*x))/(b*c - a*d))])/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]
 && NeQ[b*c - a*d, 0] &&  !IntegerQ[m] && IntegerQ[n]
```

Rule 429

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[a^p*c^q*x*AppellF1[1/n, -p, -q, 1 + 1/n, -((b*x^n)/a), -((d*x^n)/c)
], x] /; FreeQ[{a, b, c, d, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[n, -1]
 && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 510

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> Simp[(a^p*c^q*(e*x)^(m + 1)*AppellF1[(m + 1)/n, -p, -
q, 1 + (m + 1)/n, -((b*x^n)/a), -((d*x^n)/c)])/(e*(m + 1)), x] /; FreeQ[{a,
```

```
b, c, d, e, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] && NeQ[m, n
 - 1] && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 757

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Int[E
xpandIntegrand[(a + c*x^2)^p, (d/(d^2 - e^2*x^2) - (e*x)/(d^2 - e^2*x^2))^(
-m), x], x] /; FreeQ[{a, c, d, e, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !Inte
gerQ[p] && ILtQ[m, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \frac{(d\sec(e+fx))^m}{(a+b\tan(e+fx))^2}\,dx = \frac{\left((d\sec(e+fx))^m \sec^2(e+fx)^{-m/2}\right)\text{Subst}\left(\int \frac{\left(1+\frac{x^2}{b^2}\right)^{-1+\frac{m}{2}}}{(a+x)^2}\,dx, x, b\tan(e+fx)\right)}{bf}$$

$$= \frac{\left((d\sec(e+fx))^m \sec^2(e+fx)^{-m/2}\right)\text{Subst}\left(\int \left(\frac{a^2\left(1+\frac{x^2}{b^2}\right)^{-1+\frac{m}{2}}}{\left(a^2-x^2\right)^2} - \frac{2ax\left(1+\frac{x^2}{b^2}\right)^{-1+\frac{m}{2}}}{\left(a^2-x^2\right)^2} + \frac{x^2\left(\right.}{\left(\right.}\right.\right.}{bf}$$

$$= \frac{\left((d\sec(e+fx))^m \sec^2(e+fx)^{-m/2}\right)\text{Subst}\left(\int \frac{x^2\left(1+\frac{x^2}{b^2}\right)^{-1+\frac{m}{2}}}{\left(-a^2+x^2\right)^2}\,dx, x, b\tan(e+fx)\right)}{bf} -$$

$$= \frac{F_1\left(\frac{1}{2};2,1-\frac{m}{2};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)(d\sec(e+fx))^m \sec^2(e+fx)^{-m/2}\,\mathrm{t}}{a^2 f}$$

$$= -\frac{2ab\,{}_2F_1\left(2,\frac{m}{2};\frac{2+m}{2};\frac{b^2\sec^2(e+fx)}{a^2+b^2}\right)(d\sec(e+fx))^m}{\left(a^2+b^2\right)^2 fm} + \frac{F_1\left(\frac{1}{2};2,1-\frac{m}{2};\frac{3}{2};\frac{b^2\tan^2(e+fx}{a^2}\right.}{}$$

Mathematica [C] time = 18.52, size = 2453, normalized size = 10.81

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Sec[e + f*x])^m/(a + b*Tan[e + f*x])^2,x]
```

```
[Out] ((d*Sec[e + f*x])^m*((-2*a*b*(-1 + (Sec[e + f*x]^2)^(m/2)))/m + (a^2 - b^2)
*Hypergeometric2F1[1/2, 1 - m/2, 3/2, -Tan[e + f*x]^2]*Tan[e + f*x] + (2*a*
b*AppellF1[-m, -1/2*m, -1/2*m, 1 - m, (a - I*b)/(a + b*Tan[e + f*x]), (a +
```

```
I*b)/(a + b*Tan[e + f*x])]*(Sec[e + f*x]^2)^(m/2))/(m*((b*(-I + Tan[e + f*x
]))/(a + b*Tan[e + f*x]))^(m/2)*((b*(I + Tan[e + f*x]))/(a + b*Tan[e + f*x]
))^(m/2)) + (b*(a^2 + b^2)*AppellF1[1 - m, -1/2*m, -1/2*m, 2 - m, (a - I*b)
/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])]*(Sec[e + f*x]^2)^(m/
2))/((-1 + m)*((b*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*((b*(I +
 Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*(a + b*Tan[e + f*x])))))/(f*(a +
 b*Tan[e + f*x])^2*((a^2 - b^2)*Hypergeometric2F1[1/2, 1 - m/2, 3/2, -Tan[e
 + f*x]^2]*Sec[e + f*x]^2 - 2*a*b*(Sec[e + f*x]^2)^(m/2)*Tan[e + f*x] + (2*
a*b*AppellF1[-m, -1/2*m, -1/2*m, 1 - m, (a - I*b)/(a + b*Tan[e + f*x]), (a
+ I*b)/(a + b*Tan[e + f*x])]*(Sec[e + f*x]^2)^(m/2)*Tan[e + f*x])/(((b*(-I
+ Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*((b*(I + Tan[e + f*x]))/(a + b
*Tan[e + f*x]))^(m/2)) - (b^2*(a^2 + b^2)*AppellF1[1 - m, -1/2*m, -1/2*m, 2
 - m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])]*(Sec[
e + f*x]^2)^(1 + m/2))/((-1 + m)*((b*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*
x]))^(m/2)*((b*(I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*(a + b*Tan[e
 + f*x])^2) + (b*(a^2 + b^2)*m*AppellF1[1 - m, -1/2*m, -1/2*m, 2 - m, (a -
I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])]*(Sec[e + f*x]^2)
^(m/2)*Tan[e + f*x])/((-1 + m)*((b*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x]
))^(m/2)*((b*(I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*(a + b*Tan[e +
 f*x])) + (2*a*b*(Sec[e + f*x]^2)^(m/2)*(-1/2*((a - I*b)*b*m^2*AppellF1[1 -
 m, 1 - m/2, -1/2*m, 2 - m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a +
b*Tan[e + f*x])]*Sec[e + f*x]^2)/((1 - m)*(a + b*Tan[e + f*x])^2) - ((a + I
*b)*b*m^2*AppellF1[1 - m, -1/2*m, 1 - m/2, 2 - m, (a - I*b)/(a + b*Tan[e +
f*x]), (a + I*b)/(a + b*Tan[e + f*x])]*Sec[e + f*x]^2)/(2*(1 - m)*(a + b*Ta
n[e + f*x])^2)))/(m*((b*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*((
b*(I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)) + (b*(a^2 + b^2)*(Sec[e
+ f*x]^2)^(m/2)*(((a - I*b)*b*(1 - m)*m*AppellF1[2 - m, 1 - m/2, -1/2*m, 3
- m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])]*Sec[e
+ f*x]^2)/(2*(2 - m)*(a + b*Tan[e + f*x])^2) + ((a + I*b)*b*(1 - m)*m*Appel
lF1[2 - m, -1/2*m, 1 - m/2, 3 - m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b
)/(a + b*Tan[e + f*x])]*Sec[e + f*x]^2)/(2*(2 - m)*(a + b*Tan[e + f*x])^2))
)/((-1 + m)*((b*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*((b*(I + T
an[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*(a + b*Tan[e + f*x])) - (a*b*Appe
llF1[-m, -1/2*m, -1/2*m, 1 - m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(
a + b*Tan[e + f*x])]*(Sec[e + f*x]^2)^(m/2)*((b*(-I + Tan[e + f*x]))/(a + b
*Tan[e + f*x]))^(-1 - m/2)*(-((b^2*Sec[e + f*x]^2*(-I + Tan[e + f*x]))/(a +
 b*Tan[e + f*x])^2) + (b*Sec[e + f*x]^2)/(a + b*Tan[e + f*x])))/((b*(I + Ta
n[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2) - (b*(a^2 + b^2)*m*AppellF1[1 - m,
 -1/2*m, -1/2*m, 2 - m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Ta
n[e + f*x])]*(Sec[e + f*x]^2)^(m/2)*((b*(-I + Tan[e + f*x]))/(a + b*Tan[e +
 f*x]))^(-1 - m/2)*(-((b^2*Sec[e + f*x]^2*(-I + Tan[e + f*x]))/(a + b*Tan[e
 + f*x])^2) + (b*Sec[e + f*x]^2)/(a + b*Tan[e + f*x])))/(2*(-1 + m)*((b*(I
+ Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*(a + b*Tan[e + f*x])) - (a*b*A
ppellF1[-m, -1/2*m, -1/2*m, 1 - m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b
)/(a + b*Tan[e + f*x])]*(Sec[e + f*x]^2)^(m/2)*((b*(I + Tan[e + f*x]))/(a +
 b*Tan[e + f*x]))^(-1 - m/2)*(-((b^2*Sec[e + f*x]^2*(I + Tan[e + f*x]))/(a
+ b*Tan[e + f*x])^2) + (b*Sec[e + f*x]^2)/(a + b*Tan[e + f*x])))/((b*(-I +
Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2) - (b*(a^2 + b^2)*m*AppellF1[1 -
m, -1/2*m, -1/2*m, 2 - m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*
Tan[e + f*x])]*(Sec[e + f*x]^2)^(m/2)*((b*(I + Tan[e + f*x]))/(a + b*Tan[e
+ f*x]))^(-1 - m/2)*(-((b^2*Sec[e + f*x]^2*(I + Tan[e + f*x]))/(a + b*Tan[e
 + f*x])^2) + (b*Sec[e + f*x]^2)/(a + b*Tan[e + f*x])))/(2*(-1 + m)*((b*(-I
 + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*(a + b*Tan[e + f*x])) + (a^2
- b^2)*Sec[e + f*x]^2*(-Hypergeometric2F1[1/2, 1 - m/2, 3/2, -Tan[e + f*x]^
2] + (1 + Tan[e + f*x]^2)^(-1 + m/2))))
```

fricas [F] time = 0.66, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(d\sec\left(fx+e\right)\right)^{m}}{b^{2}\tan\left(fx+e\right)^{2}+2\,ab\tan\left(fx+e\right)+a^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^m/(a+b*tan(f*x+e))^2,x, algorithm="fricas")
[Out] integral((d*sec(f*x + e))^m/(b^2*tan(f*x + e)^2 + 2*a*b*tan(f*x + e) + a^2)
, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(fx+e\right)\right)^{m}}{\left(b \tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^m/(a+b*tan(f*x+e))^2,x, algorithm="giac")
[Out] integrate((d*sec(f*x + e))^m/(b*tan(f*x + e) + a)^2, x)
```

maple [F] time = 1.34, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(fx+e\right)\right)^{m}}{\left(a+b \tan\left(fx+e\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^m/(a+b*tan(f*x+e))^2,x)
[Out] int((d*sec(f*x+e))^m/(a+b*tan(f*x+e))^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(fx+e\right)\right)^{m}}{\left(b \tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^m/(a+b*tan(f*x+e))^2,x, algorithm="maxima")
[Out] integrate((d*sec(f*x + e))^m/(b*tan(f*x + e) + a)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(\frac{d}{\cos\left(e+f\,x\right)}\right)^{m}}{\left(a+b \tan\left(e+f\,x\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^m/(a + b*tan(e + f*x))^2,x)
[Out] int((d/cos(e + f*x))^m/(a + b*tan(e + f*x))^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d \sec\left(e+fx\right)\right)^{m}}{\left(a+b \tan\left(e+fx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**m/(a+b*tan(f*x+e))**2,x)
[Out] Integral((d*sec(e + f*x))**m/(a + b*tan(e + f*x))**2, x)
```

3.645 $\int (d\sec(e+fx))^m (a+b\tan(e+fx))^n\,dx$

Optimal. Leaf size=181

$$\frac{b(d\sec(e+fx))^m\left(\frac{a+b\tan(e+fx)}{\sqrt{-b^2}-a}+1\right)^{-m/2}\left(1-\frac{a+b\tan(e+fx)}{a+\sqrt{-b^2}}\right)^{-m/2}(a+b\tan(e+fx))^{n+1}F_1\left(n+1;1-\frac{m}{2},1-\frac{m}{2};n+2\right.}{f(n+1)\left(a^2+b^2\right)}$$

```
[Out] b*AppellF1(1+n,1-1/2*m,1-1/2*m,2+n,(a+b*tan(f*x+e))/(a-(-b^2)^(1/2)),(a+b*t
an(f*x+e))/(a+(-b^2)^(1/2)))*(d*sec(f*x+e))^m*(a+b*tan(f*x+e))^(1+n)/(a^2+b
^2)/f/(1+n)/((1+(a+b*tan(f*x+e))/(-a+(-b^2)^(1/2)))^(1/2*m))/((1+(-a-b*tan(
f*x+e))/(a+(-b^2)^(1/2)))^(1/2*m))
```

Rubi [A] time = 0.17, antiderivative size = 187, normalized size of antiderivative = 1.03, number of steps used = 3, number of rules used = 3, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.130, Rules used = {3512, 760, 133}

$$\frac{\cos^2(e+fx)(d\sec(e+fx))^m\left(1-\frac{a+b\tan(e+fx)}{a-\sqrt{-b^2}}\right)^{1-\frac{m}{2}}\left(1-\frac{a+b\tan(e+fx)}{a+\sqrt{-b^2}}\right)^{1-\frac{m}{2}}(a+b\tan(e+fx))^{n+1}F_1\left(n+1;1-\frac{m}{2},1\right.}{bf(n+1)}$$

Warning: Unable to verify antiderivative.

```
[In] Int[(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n,x]
```

```
[Out] (AppellF1[1 + n, 1 - m/2, 1 - m/2, 2 + n, (a + b*Tan[e + f*x])/(a - Sqrt[-b
^2]), (a + b*Tan[e + f*x])/(a + Sqrt[-b^2])]*Cos[e + f*x]^2*(d*Sec[e + f*x]
)^m*(a + b*Tan[e + f*x])^(1 + n)*(1 - (a + b*Tan[e + f*x])/(a - Sqrt[-b^2])
)^(1 - m/2)*(1 - (a + b*Tan[e + f*x])/(a + Sqrt[-b^2]))^(1 - m/2))/(b*f*(1
+ n))
```

Rule 133

```
Int[((b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_)*((e_) + (f_.)*(x_))^(p_), x_
Symbol] :> Simp[(c^n*e^p*(b*x)^(m + 1)*AppellF1[m + 1, -n, -p, m + 2, -((d*
x)/c), -((f*x)/e)])/(b*(m + 1)), x] /; FreeQ[{b, c, d, e, f, m, n, p}, x] &
&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[c, 0] && (IntegerQ[p] || GtQ[e, 0])
```

Rule 760

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[(a + c*x^2)^p/(e*(1 - (d + e*x)/(d + (e*q)/c))^p*
(1 - (d + e*x)/(d - (e*q)/c))^p), Subst[Int[x^m*Simp[1 - x/(d + (e*q)/c), x
]^p*Simp[1 - x/(d - (e*q)/c), x]^p, x], x, d + e*x], x]] /; FreeQ[{a, c, d,
 e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IntegerQ[p]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int (d\sec(e+fx))^m(a+b\tan(e+fx))^n\,dx = \frac{\left((d\sec(e+fx))^m\sec^2(e+fx)^{-m/2}\right)\text{Subst}\left(\int (a+x)^n\left(1+\frac{x^2}{b^2}\right)^{-1+}\right.}{bf}$$

$$= \frac{\left(\cos^2(e+fx)(d\sec(e+fx))^m\left(1-\frac{a+b\tan(e+fx)}{a-\frac{b^2}{\sqrt{-b^2}}}\right)^{1-\frac{m}{2}}\left(1-\frac{a+b\tan(e+}{a+\frac{b^2}{\sqrt{-b^2}}}\right.\right.}{}$$

$$= \frac{F_1\left(1+n;1-\frac{m}{2},1-\frac{m}{2};2+n;\frac{a+b\tan(e+fx)}{a-\sqrt{-b^2}},\frac{a+b\tan(e+fx)}{a+\sqrt{-b^2}}\right)\cos^2(e+}{}$$

Mathematica [C] time = 6.55, size = 699, normalized size = 3.86

$$\frac{}{f\left(2n(b-a\tan(e+fx))F_1\left(n+1;1-\frac{m}{2},1-\frac{m}{2};n+2;\frac{a+b\tan(e+fx)}{a-ib},\frac{a+b\tan(e+fx)}{a+ib}\right)+2(m+n)\tan(e+fx)(a+b\right.}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n,x]
```

```
[Out] (2*AppellF1[1 + n, 1 - m/2, 1 - m/2, 2 + n, (a + b*Tan[e + f*x])/(a - I*b),
 (a + b*Tan[e + f*x])/(a + I*b)]*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(1
 + n))/(f*(2*b*AppellF1[1 + n, 1 - m/2, 1 - m/2, 2 + n, (a + b*Tan[e + f*x]
)/(a - I*b), (a + b*Tan[e + f*x])/(a + I*b)]*Sec[e + f*x]^2 + 2*n*AppellF1[
1 + n, 1 - m/2, 1 - m/2, 2 + n, (a + b*Tan[e + f*x])/(a - I*b), (a + b*Tan[
e + f*x])/(a + I*b)]*(b - a*Tan[e + f*x]) - (b*(-2 + m)*(1 + n)*((a - I*b)*
AppellF1[2 + n, 1 - m/2, 2 - m/2, 3 + n, (a + b*Tan[e + f*x])/(a - I*b), (a
 + b*Tan[e + f*x])/(a + I*b)] + (a + I*b)*AppellF1[2 + n, 2 - m/2, 1 - m/2,
 3 + n, (a + b*Tan[e + f*x])/(a - I*b), (a + b*Tan[e + f*x])/(a + I*b)])*Se
c[e + f*x]^2*(a + b*Tan[e + f*x]))/((a - I*b)*(a + I*b)*(2 + n)) + 2*(m + n
)*AppellF1[1 + n, 1 - m/2, 1 - m/2, 2 + n, (a + b*Tan[e + f*x])/(a - I*b),
(a + b*Tan[e + f*x])/(a + I*b)]*Tan[e + f*x]*(a + b*Tan[e + f*x]) - (m*Appe
llF1[1 + n, 1 - m/2, 1 - m/2, 2 + n, (a + b*Tan[e + f*x])/(a - I*b), (a + b
*Tan[e + f*x])/(a + I*b)]*Sec[e + f*x]^2*(a + b*Tan[e + f*x]))/(-I + Tan[e
+ f*x]) - (m*AppellF1[1 + n, 1 - m/2, 1 - m/2, 2 + n, (a + b*Tan[e + f*x])/
(a - I*b), (a + b*Tan[e + f*x])/(a + I*b)]*Sec[e + f*x]^2*(a + b*Tan[e + f*
x]))/(I + Tan[e + f*x])))
```

fricas [F] time = 0.65, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(d\sec\left(fx+e\right)\right)^m\left(b\tan\left(fx+e\right)+a\right)^n,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^m*(a+b*tan(f*x+e))^n,x, algorithm="fricas")
```

```
[Out] integral((d*sec(f*x + e))^m*(b*tan(f*x + e) + a)^n, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\sec\left(fx+e\right)\right)^m\left(b\tan\left(fx+e\right)+a\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^m*(a+b*tan(f*x+e))^n,x, algorithm="giac")
[Out] integrate((d*sec(f*x + e))^m*(b*tan(f*x + e) + a)^n, x)
```

maple [F] time = 0.93, size = 0, normalized size = 0.00

$$\int \left(d \sec \left(f x+e\right)\right)^{m} \left(a+b \tan \left(f x+e\right)\right)^{n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*sec(f*x+e))^m*(a+b*tan(f*x+e))^n,x)
[Out] int((d*sec(f*x+e))^m*(a+b*tan(f*x+e))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d \sec \left(f x+e\right)\right)^{m} \left(b \tan \left(f x+e\right)+a\right)^{n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))^m*(a+b*tan(f*x+e))^n,x, algorithm="maxima")
[Out] integrate((d*sec(f*x + e))^m*(b*tan(f*x + e) + a)^n, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(\frac{d}{\cos \left(e+f\,x\right)}\right)}^m\,{\left(a+b\,\tan \left(e+f\,x\right)\right)}^n \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d/cos(e + f*x))^m*(a + b*tan(e + f*x))^n,x)
[Out] int((d/cos(e + f*x))^m*(a + b*tan(e + f*x))^n, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d \sec {\left(e + f x \right)}\right)^{m} \left(a + b \tan {\left(e + f x \right)}\right)^{n}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*sec(f*x+e))**m*(a+b*tan(f*x+e))**n,x)
[Out] Integral((d*sec(e + f*x))**m*(a + b*tan(e + f*x))**n, x)
```

3.646 $\int \sec^6(c+dx)(a+b\tan(c+dx))^n\,dx$

Optimal. Leaf size=161

$$\frac{\left(a^2+b^2\right)^2(a+b\tan(c+dx))^{n+1}}{b^5d(n+1)}-\frac{4a\left(a^2+b^2\right)(a+b\tan(c+dx))^{n+2}}{b^5d(n+2)}+\frac{2\left(3a^2+b^2\right)(a+b\tan(c+dx))^{n+3}}{b^5d(n+3)}-\frac{4a}{}$$

```
[Out] (a^2+b^2)^2*(a+b*tan(d*x+c))^(1+n)/b^5/d/(1+n)-4*a*(a^2+b^2)*(a+b*tan(d*x+c
))^(2+n)/b^5/d/(2+n)+2*(3*a^2+b^2)*(a+b*tan(d*x+c))^(3+n)/b^5/d/(3+n)-4*a*(
a+b*tan(d*x+c))^(4+n)/b^5/d/(4+n)+(a+b*tan(d*x+c))^(5+n)/b^5/d/(5+n)
```

Rubi [A] time = 0.12, antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {3506, 697}

$$\frac{\left(a^2+b^2\right)^2(a+b\tan(c+dx))^{n+1}}{b^5d(n+1)}-\frac{4a\left(a^2+b^2\right)(a+b\tan(c+dx))^{n+2}}{b^5d(n+2)}+\frac{2\left(3a^2+b^2\right)(a+b\tan(c+dx))^{n+3}}{b^5d(n+3)}-\frac{4a}{}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^6*(a + b*Tan[c + d*x])^n,x]
```

```
[Out] ((a^2 + b^2)^2*(a + b*Tan[c + d*x])^(1 + n))/(b^5*d*(1 + n)) - (4*a*(a^2 +
b^2)*(a + b*Tan[c + d*x])^(2 + n))/(b^5*d*(2 + n)) + (2*(3*a^2 + b^2)*(a +
b*Tan[c + d*x])^(3 + n))/(b^5*d*(3 + n)) - (4*a*(a + b*Tan[c + d*x])^(4 + n
))/(b^5*d*(4 + n)) + (a + b*Tan[c + d*x])^(5 + n)/(b^5*d*(5 + n))
```

Rule 697

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m},
 x] && NeQ[c*d^2 + a*e^2, 0] && IGtQ[p, 0]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^6(c+dx)(a+b\tan(c+dx))^n\,dx&=\frac{\text{Subst}\left(\int (a+x)^n\left(1+\frac{x^2}{b^2}\right)^2\,dx,x,b\tan(c+dx)\right)}{bd}\\&=\frac{\text{Subst}\left(\int \left(\frac{\left(a^2+b^2\right)^2(a+x)^n}{b^4}-\frac{4a\left(a^2+b^2\right)(a+x)^{1+n}}{b^4}+\frac{2\left(3a^2+b^2\right)(a+x)^{2+n}}{b^4}-\frac{4a(a+x)^3}{b^4}\right.\right.}{bd}\\&=\frac{\left(a^2+b^2\right)^2(a+b\tan(c+dx))^{1+n}}{b^5d(1+n)}-\frac{4a\left(a^2+b^2\right)(a+b\tan(c+dx))^{2+}}{b^5d(2+n)}\end{aligned}$$

Mathematica [A] time = 3.03, size = 161, normalized size = 1.00

$$\frac{(a+b\tan(c+dx))^{n+1}\left(4\left(a^2+b^2\right)\left(\frac{a^2+b^2}{n+1}+\frac{(a+b\tan(c+dx))^2}{n+3}-\frac{2a(a+b\tan(c+dx))}{n+2}\right)-4a(a+b\tan(c+dx))\left(\frac{a^2+b^2}{n+2}+\frac{(a}{}\right.\right.}{b^5d(n+5)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^6*(a + b*Tan[c + d*x])^n,x]
```

```
[Out] ((a + b*Tan[c + d*x])^(1 + n)*(b^4*Sec[c + d*x]^4 + 4*(a^2 + b^2)*((a^2 + b
^2)/(1 + n) - (2*a*(a + b*Tan[c + d*x]))/(2 + n) + (a + b*Tan[c + d*x])^2/(
3 + n)) - 4*a*(a + b*Tan[c + d*x])*((a^2 + b^2)/(2 + n) - (2*a*(a + b*Tan[c
 + d*x]))/(3 + n) + (a + b*Tan[c + d*x])^2/(4 + n))))/(b^5*d*(5 + n))
```

fricas [B] time = 0.75, size = 420, normalized size = 2.61

$$\left(8\left(3a^5 + 10a^3b^2 + 15ab^4 - \left(a^3b^2 - 3ab^4\right)n^2 + 3\left(a^3b^2 + 5ab^4\right)n\right)\cos\left(dx+c\right)^5 + 4\left(2ab^4n^3 + 3\left(a^3b^2 + 3ab^4\right)n\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+b*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] (8*(3*a^5 + 10*a^3*b^2 + 15*a*b^4 - (a^3*b^2 - 3*a*b^4)*n^2 + 3*(a^3*b^2 +
5*a*b^4)*n)*cos(d*x + c)^5 + 4*(2*a*b^4*n^3 + 3*(a^3*b^2 + 3*a*b^4)*n^2 + (
3*a^3*b^2 + 7*a*b^4)*n)*cos(d*x + c)^3 + (a*b^4*n^4 + 6*a*b^4*n^3 + 11*a*b^
4*n^2 + 6*a*b^4*n)*cos(d*x + c) + (b^5*n^4 + 10*b^5*n^3 + 35*b^5*n^2 + 50*b
^5*n + 24*b^5 + 8*(8*b^5 - (3*a^2*b^3 - b^5)*n^2 - 3*(a^4*b + 3*a^2*b^3 - 2
*b^5)*n)*cos(d*x + c)^4 + 4*(8*b^5 - (a^2*b^3 - b^5)*n^3 - (3*a^2*b^3 - 7*b
^5)*n^2 - 2*(a^2*b^3 - 7*b^5)*n)*cos(d*x + c)^2)*sin(d*x + c))*((a*cos(d*x
+ c) + b*sin(d*x + c))/cos(d*x + c))^n/((b^5*d*n^5 + 15*b^5*d*n^4 + 85*b^5*
d*n^3 + 225*b^5*d*n^2 + 274*b^5*d*n + 120*b^5*d)*cos(d*x + c)^5)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(b\tan\left(dx+c\right) + a\right)^n \sec\left(dx+c\right)^6\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+b*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((b*tan(d*x + c) + a)^n*sec(d*x + c)^6, x)
```

maple [F] time = 0.87, size = 0, normalized size = 0.00

$$\int \left(\sec^6\left(dx+c\right)\right)\left(a + b\tan\left(dx+c\right)\right)^n\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^6*(a+b*tan(d*x+c))^n,x)
```

```
[Out] int(sec(d*x+c)^6*(a+b*tan(d*x+c))^n,x)
```

maxima [A] time = 0.34, size = 286, normalized size = 1.78

$$\frac{\left(b\tan\left(dx+c\right)+a\right)^{n+1}}{b(n+1)} + \frac{2\left(\left(n^2+3n+2\right)b^3\tan\left(dx+c\right)^3+\left(n^2+n\right)ab^2\tan\left(dx+c\right)^2-2a^2bn\tan\left(dx+c\right)+2a^3\right)\left(b\tan\left(dx+c\right)+a\right)^n}{\left(n^3+6n^2+11n+6\right)b^3} + \frac{\left(\left(n^4+10n^3+35n^2+50n+2\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^6*(a+b*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] ((b*tan(d*x + c) + a)^(n + 1)/(b*(n + 1)) + 2*((n^2 + 3*n + 2)*b^3*tan(d*x
+ c)^3 + (n^2 + n)*a*b^2*tan(d*x + c)^2 - 2*a^2*b*n*tan(d*x + c) + 2*a^3)*(
b*tan(d*x + c) + a)^n/((n^3 + 6*n^2 + 11*n + 6)*b^3) + ((n^4 + 10*n^3 + 35*
```

```
n^2 + 50*n + 24)*b^5*tan(d*x + c)^5 + (n^4 + 6*n^3 + 11*n^2 + 6*n)*a*b^4*ta
n(d*x + c)^4 - 4*(n^3 + 3*n^2 + 2*n)*a^2*b^3*tan(d*x + c)^3 + 12*(n^2 + n)*
a^3*b^2*tan(d*x + c)^2 - 24*a^4*b*n*tan(d*x + c) + 24*a^5)*(b*tan(d*x + c)
+ a)^n/((n^5 + 15*n^4 + 85*n^3 + 225*n^2 + 274*n + 120)*b^5))/d
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\tan(c+dx))^n}{\cos(c+dx)^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))^n/cos(c + d*x)^6,x)
```

```
[Out] int((a + b*tan(c + d*x))^n/cos(c + d*x)^6, x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**6*(a+b*tan(d*x+c))**n,x)
```

```
[Out] Timed out
```

3.647 $\int \sec^4(c+dx)(a+b\tan(c+dx))^n\,dx$

Optimal. Leaf size=88

$$\frac{(a^2+b^2)\,(a+b\tan(c+dx))^{n+1}}{b^3d(n+1)}-\frac{2a(a+b\tan(c+dx))^{n+2}}{b^3d(n+2)}+\frac{(a+b\tan(c+dx))^{n+3}}{b^3d(n+3)}$$

```
[Out] (a^2+b^2)*(a+b*tan(d*x+c))^(1+n)/b^3/d/(1+n)-2*a*(a+b*tan(d*x+c))^(2+n)/b^3
/d/(2+n)+(a+b*tan(d*x+c))^(3+n)/b^3/d/(3+n)
```

Rubi [A] time = 0.08, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {3506, 697}

$$\frac{(a^2+b^2)\,(a+b\tan(c+dx))^{n+1}}{b^3d(n+1)}-\frac{2a(a+b\tan(c+dx))^{n+2}}{b^3d(n+2)}+\frac{(a+b\tan(c+dx))^{n+3}}{b^3d(n+3)}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^4*(a + b*Tan[c + d*x])^n,x]
```

```
[Out] ((a^2 + b^2)*(a + b*Tan[c + d*x])^(1 + n))/(b^3*d*(1 + n)) - (2*a*(a + b*Ta
n[c + d*x])^(2 + n))/(b^3*d*(2 + n)) + (a + b*Tan[c + d*x])^(3 + n)/(b^3*d*
(3 + n))
```

Rule 697

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(d + e*x)^m*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m},
 x] && NeQ[c*d^2 + a*e^2, 0] && IGtQ[p, 0]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^4(c+dx)(a+b\tan(c+dx))^n\,dx&=\frac{\text{Subst}\left(\int (a+x)^n\left(1+\frac{x^2}{b^2}\right)dx,x,b\tan(c+dx)\right)}{bd}\\&=\frac{\text{Subst}\left(\int\left(\frac{(a^2+b^2)(a+x)^n}{b^2}-\frac{2a(a+x)^{1+n}}{b^2}+\frac{(a+x)^{2+n}}{b^2}\right)dx,x,b\tan(c+dx)\right)}{bd}\\&=\frac{(a^2+b^2)\,(a+b\tan(c+dx))^{1+n}}{b^3d(1+n)}-\frac{2a(a+b\tan(c+dx))^{2+n}}{b^3d(2+n)}+\frac{(a+b\tan(c+dx))^{3+n}}{b^3d(3+n)}\end{aligned}$$

Mathematica [A] time = 0.24, size = 71, normalized size = 0.81

$$\frac{(a+b\tan(c+dx))^{n+1}\left(\frac{a^2+b^2}{n+1}+\frac{(a+b\tan(c+dx))^2}{n+3}-\frac{2a(a+b\tan(c+dx))}{n+2}\right)}{b^3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^4*(a + b*Tan[c + d*x])^n,x]
```

```
[Out] ((a + b*Tan[c + d*x])^(1 + n)*((a^2 + b^2)/(1 + n) - (2*a*(a + b*Tan[c + d*
x]))/(2 + n) + (a + b*Tan[c + d*x])^2/(3 + n)))/(b^3*d)
```

fricas [A] time = 0.89, size = 176, normalized size = 2.00

$$\frac{\left(2\left(2\,ab^2n + a^3 + 3\,ab^2\right)\cos\left(dx+c\right)^3 + \left(ab^2n^2 + ab^2n\right)\cos\left(dx+c\right) + \left(b^3n^2 + 3\,b^3n + 2\,b^3 + 2\left(2\,b^3 - \left(a^2b - \right.\right.\right.}{\left(b^3dn^3 + 6\,b^3dn^2 + 11\,b^3dn + 6\,b^3d\right)\cos\left(dx+c\right)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+b*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] (2*(2*a*b^2*n + a^3 + 3*a*b^2)*cos(d*x + c)^3 + (a*b^2*n^2 + a*b^2*n)*cos(d
*x + c) + (b^3*n^2 + 3*b^3*n + 2*b^3 + 2*(2*b^3 - (a^2*b - b^3)*n)*cos(d*x
+ c)^2)*sin(d*x + c))*((a*cos(d*x + c) + b*sin(d*x + c))/cos(d*x + c))^n/((
b^3*d*n^3 + 6*b^3*d*n^2 + 11*b^3*d*n + 6*b^3*d)*cos(d*x + c)^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(b\tan\left(dx+c\right)+a\right)^n \sec\left(dx+c\right)^4\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+b*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((b*tan(d*x + c) + a)^n*sec(d*x + c)^4, x)
```

maple [F] time = 0.70, size = 0, normalized size = 0.00

$$\int \left(\sec^4\left(dx+c\right)\right)\left(a+b\tan\left(dx+c\right)\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^4*(a+b*tan(d*x+c))^n,x)
```

```
[Out] int(sec(d*x+c)^4*(a+b*tan(d*x+c))^n,x)
```

maxima [A] time = 0.39, size = 116, normalized size = 1.32

$$\frac{\frac{\left(b\tan\left(dx+c\right)+a\right)^{n+1}}{b(n+1)} + \frac{\left(\left(n^2+3\,n+2\right)b^3\tan\left(dx+c\right)^3+\left(n^2+n\right)ab^2\tan\left(dx+c\right)^2-2\,a^2bn\tan\left(dx+c\right)+2\,a^3\right)\left(b\tan\left(dx+c\right)+a\right)^n}{\left(n^3+6\,n^2+11\,n+6\right)b^3}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^4*(a+b*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] ((b*tan(d*x + c) + a)^(n + 1)/(b*(n + 1)) + ((n^2 + 3*n + 2)*b^3*tan(d*x +
c)^3 + (n^2 + n)*a*b^2*tan(d*x + c)^2 - 2*a^2*b*n*tan(d*x + c) + 2*a^3)*(b*
tan(d*x + c) + a)^n/((n^3 + 6*n^2 + 11*n + 6)*b^3))/d
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\tan\left(c+d\,x\right)\right)^n}{\cos\left(c+d\,x\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))^n/cos(c + d*x)^4,x)
```

```
[Out] int((a + b*tan(c + d*x))^n/cos(c + d*x)^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a + b\tan (c + dx))^n \sec^4 (c + dx)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**4*(a+b*tan(d*x+c))**n,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**n*sec(c + d*x)**4, x)
```

3.648 $\int \sec^2(c+dx)(a+b\tan(c+dx))^n\,dx$

Optimal. Leaf size=26

$$\frac{(a+b\tan(c+dx))^{n+1}}{bd(n+1)}$$

```
[Out] (a+b*tan(d*x+c))^(1+n)/b/d/(1+n)
```

Rubi [A] time = 0.04, antiderivative size = 26, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.095$, Rules used = {3506, 32}

$$\frac{(a+b\tan(c+dx))^{n+1}}{bd(n+1)}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^2*(a + b*Tan[c + d*x])^n,x]
```

```
[Out] (a + b*Tan[c + d*x])^(1 + n)/(b*d*(1 + n))
```

Rule 32

```
Int[((a_.) + (b_.)*(x_))^(m_), x_Symbol] :> Simp[(a + b*x)^(m + 1)/(b*(m +
1)), x] /; FreeQ[{a, b, m}, x] && NeQ[m, -1]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\begin{aligned}\int \sec^2(c+dx)(a+b\tan(c+dx))^n\,dx &= \frac{\text{Subst}\left(\int (a+x)^n\,dx, x, b\tan(c+dx)\right)}{bd}\\ &= \frac{(a+b\tan(c+dx))^{1+n}}{bd(1+n)}\end{aligned}$$

Mathematica [A] time = 0.18, size = 26, normalized size = 1.00

$$\frac{(a+b\tan(c+dx))^{n+1}}{bd(n+1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sec[c + d*x]^2*(a + b*Tan[c + d*x])^n,x]
```

```
[Out] (a + b*Tan[c + d*x])^(1 + n)/(b*d*(1 + n))
```

fricas [B] time = 0.45, size = 64, normalized size = 2.46

$$\frac{(a\cos(dx+c)+b\sin(dx+c))\left(\frac{a\cos(dx+c)+b\sin(dx+c)}{\cos(dx+c)}\right)^n}{(bdn+bd)\cos(dx+c)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+b*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] (a*cos(d*x + c) + b*sin(d*x + c))*((a*cos(d*x + c) + b*sin(d*x + c))/cos(d*
x + c))^n/((b*d*n + b*d)*cos(d*x + c))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\tan(dx+c)+a)^n \sec(dx+c)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+b*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((b*tan(d*x + c) + a)^n*sec(d*x + c)^2, x)
```

maple [A] time = 0.15, size = 27, normalized size = 1.04

$$\frac{(a+b\tan(dx+c))^{1+n}}{bd\,(1+n)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^2*(a+b*tan(d*x+c))^n,x)
```

```
[Out] (a+b*tan(d*x+c))^(1+n)/b/d/(1+n)
```

maxima [A] time = 0.45, size = 26, normalized size = 1.00

$$\frac{(b\tan(dx+c)+a)^{n+1}}{bd(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^2*(a+b*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] (b*tan(d*x + c) + a)^(n + 1)/(b*d*(n + 1))
```

mupad [B] time = 4.31, size = 51, normalized size = 1.96

$$\begin{cases} \frac{\ln(a+b\tan(c+d\,x))}{b\,d} & \text{if } n=-1 \\ \frac{(a+b\tan(c+d\,x))^{n+1}}{b\,d\,(n+1)} & \text{if } n\neq -1 \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))^n/cos(c + d*x)^2,x)
```

```
[Out] piecewise(n == -1, log(a + b*tan(c + d*x))/(b*d), n ~= -1, (a + b*tan(c + d
*x))^(n + 1)/(b*d*(n + 1)))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+b\tan(c+dx))^n \sec^2(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**2*(a+b*tan(d*x+c))**n,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**n*sec(c + d*x)**2, x)
```

3.649 $\int \cos^2(c+dx)(a+b\tan(c+dx))^n\,dx$

Optimal. Leaf size=272

$$-\frac{\left(\sqrt{-b^2}\left(\frac{a^2}{b^2}-n+1\right)-an\right)(a+b\tan(c+dx))^{n+1}\,{}_2F_1\left(1,n+1;n+2;\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}}\right)}{4bd(n+1)\left(\frac{a^2}{b^2}+1\right)\left(a-\sqrt{-b^2}\right)}+\frac{b\left(\sqrt{-b^2}\left(\frac{a^2}{b^2}-n+1\right)+a\right.}{}$$

```
[Out] -1/4*hypergeom([1, 1+n],[2+n],(a+b*tan(d*x+c))/(a-(-b^2)^(1/2)))*(-a*n+(1+a
^2/b^2-n)*(-b^2)^(1/2))*(a+b*tan(d*x+c))^(1+n)/(1+a^2/b^2)/b/d/(1+n)/(a-(-b
^2)^(1/2))+1/4*b*hypergeom([1, 1+n],[2+n],(a+b*tan(d*x+c))/(a+(-b^2)^(1/2))
)*(a*n+(1+a^2/b^2-n)*(-b^2)^(1/2))*(a+b*tan(d*x+c))^(1+n)/(a^2+b^2)/d/(1+n)
/(a+(-b^2)^(1/2))+1/2*cos(d*x+c)^2*(b+a*tan(d*x+c))*(a+b*tan(d*x+c))^(1+n)/
(a^2+b^2)/d
```

Rubi [A] time = 0.46, antiderivative size = 272, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used = {3506, 741, 831, 68}

$$-\frac{\left(\sqrt{-b^2}\left(\frac{a^2}{b^2}-n+1\right)-an\right)(a+b\tan(c+dx))^{n+1}\,{}_2F_1\left(1,n+1;n+2;\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}}\right)}{4bd(n+1)\left(\frac{a^2}{b^2}+1\right)\left(a-\sqrt{-b^2}\right)}+\frac{b\left(\sqrt{-b^2}\left(\frac{a^2}{b^2}-n+1\right)+a\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^2*(a + b*Tan[c + d*x])^n,x]
```

```
[Out] -((Sqrt[-b^2]*(1 + a^2/b^2 - n) - a*n)*Hypergeometric2F1[1, 1 + n, 2 + n, (
a + b*Tan[c + d*x])/(a - Sqrt[-b^2])]*(a + b*Tan[c + d*x])^(1 + n))/(4*(1 +
 a^2/b^2)*b*(a - Sqrt[-b^2])*d*(1 + n)) + (b*(Sqrt[-b^2]*(1 + a^2/b^2 - n)
+ a*n)*Hypergeometric2F1[1, 1 + n, 2 + n, (a + b*Tan[c + d*x])/(a + Sqrt[-b
^2])]*(a + b*Tan[c + d*x])^(1 + n))/(4*(a^2 + b^2)*(a + Sqrt[-b^2])*d*(1 +
n)) + (Cos[c + d*x]^2*(b + a*Tan[c + d*x])*(a + b*Tan[c + d*x])^(1 + n))/(2
*(a^2 + b^2)*d)
```

Rule 68

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a
+ b*x))/(b*c - a*d))])/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]
 && NeQ[b*c - a*d, 0] &&  !IntegerQ[m] && IntegerQ[n]
```

Rule 741

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(a*e + c*d*x)*(a + c*x^2)^(p + 1))/(2*a*(p + 1)*(c*d^2
+ a*e^2)), x] + Dist[1/(2*a*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*Simp[
c*d^2*(2*p + 3) + a*e^2*(m + 2*p + 3) + c*e*d*(m + 2*p + 4)*x, x]*(a + c*x^
2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] &&
 LtQ[p, -1] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 831

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_) + (c_.)*(x_)^2),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m, (f + g*x)/(a + c*x^2), x], x
] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !RationalQ[m
]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^2(c+dx)(a+b\tan(c+dx))^n\,dx = \frac{\text{Subst}\left(\int \frac{(a+x)^n}{\left(1+\frac{x^2}{b^2}\right)^2}\,dx, x, b\tan(c+dx)\right)}{bd}$$

$$= \frac{\cos^2(c+dx)(b+a\tan(c+dx))(a+b\tan(c+dx))^{1+n}}{2\left(a^2+b^2\right)d} - \frac{b\,\text{Subst}\left(\int \frac{(a+x)}{\ldots}\right.}{\ldots}$$

$$= \frac{\cos^2(c+dx)(b+a\tan(c+dx))(a+b\tan(c+dx))^{1+n}}{2\left(a^2+b^2\right)d} - \frac{b\,\text{Subst}\left(\int\left(\frac{(-a}{\ldots}\right.\right.}{\ldots}$$

$$= \frac{\cos^2(c+dx)(b+a\tan(c+dx))(a+b\tan(c+dx))^{1+n}}{2\left(a^2+b^2\right)d} + \frac{\left(b\left(\sqrt{-b^2}\left(1+\ldots\right.\right.\right.}{\ldots}$$

$$= -\frac{b\left(\sqrt{-b^2}\left(1+\frac{a^2}{b^2}-n\right)-an\right)\,{}_2F_1\left(1,1+n;2+n;\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}}\right)(a+b\tan\ldots}{4\left(a^2+b^2\right)\left(a-\sqrt{-b^2}\right)d(1+n)}$$

Mathematica [A] time = 1.27, size = 225, normalized size = 0.83

$$\frac{(a+b\tan(c+dx))^{n+1}\left(-\frac{\left(\sqrt{-b^2}\left(a^2-b^2(n-1)\right)-ab^2n\right){}_2F_1\left(1,n+1;n+2;\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}}\right)}{(n+1)\left(a-\sqrt{-b^2}\right)}+\frac{\left(a^2\sqrt{-b^2}+ab^2n+\left(-b^2\right)^{3/2}(n-1)\right){}_2F_1\left(1,n+1;n+2;\frac{a+b\tan\ldots}{a+\ldots}\right.}{(n+1)\left(a+\sqrt{-b^2}\right)}\ldots}{4bd\left(a^2+b^2\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^2*(a + b*Tan[c + d*x])^n,x]
```

```
[Out] ((a + b*Tan[c + d*x])^(1 + n)*(-(((Sqrt[-b^2]*(a^2 - b^2*(-1 + n)) - a*b^2*
n)*Hypergeometric2F1[1, 1 + n, 2 + n, (a + b*Tan[c + d*x])/(a - Sqrt[-b^2])
])/((a - Sqrt[-b^2])*(1 + n))) + ((a^2*Sqrt[-b^2] + (-b^2)^(3/2)*(-1 + n) +
 a*b^2*n)*Hypergeometric2F1[1, 1 + n, 2 + n, (a + b*Tan[c + d*x])/(a + Sqrt
[-b^2])])/((a + Sqrt[-b^2])*(1 + n)) + 2*b*Cos[c + d*x]^2*(b + a*Tan[c + d*
x])))/(4*b*(a^2 + b^2)*d)
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left((b\tan(dx+c)+a)^n\cos(dx+c)^2, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+b*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral((b*tan(d*x + c) + a)^n*cos(d*x + c)^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\tan(dx+c)+a)^n\cos(dx+c)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+b*tan(d*x+c))^n,x, algorithm="giac")
[Out] integrate((b*tan(d*x + c) + a)^n*cos(d*x + c)^2, x)
```

maple [F] time = 1.18, size = 0, normalized size = 0.00

$$\int \left(\cos^2(dx+c)\right)(a+b\tan(dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^2*(a+b*tan(d*x+c))^n,x)
[Out] int(cos(d*x+c)^2*(a+b*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\tan(dx+c)+a)^n\cos(dx+c)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^2*(a+b*tan(d*x+c))^n,x, algorithm="maxima")
[Out] integrate((b*tan(d*x + c) + a)^n*cos(d*x + c)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \cos(c+d\,x)^2\,(a+b\tan(c+d\,x))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^2*(a + b*tan(c + d*x))^n,x)
[Out] int(cos(c + d*x)^2*(a + b*tan(c + d*x))^n, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+b\tan(c+dx))^n\cos^2(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**2*(a+b*tan(d*x+c))**n,x)
[Out] Integral((a + b*tan(c + d*x))**n*cos(c + d*x)**2, x)
```

3.650 $\int \cos^4(c+dx)(a+b\tan(c+dx))^n\,dx$

Optimal. Leaf size=434

$$\frac{\cos^4(c+dx)(a\tan(c+dx)+b)(a+b\tan(c+dx))^{n+1}}{4d\left(a^2+b^2\right)}+\frac{b\cos^2(c+dx)\left(ab\left(\frac{3a^2}{b^2}-2n+5\right)\tan(c+dx)+a^2(n+1)\right.}{8d\left(a^2+b^2\right)^2}$$

```
[Out] 1/16*b*hypergeom([1, 1+n],[2+n],(a+b*tan(d*x+c))/(a-(-b^2)^(1/2)))*(a*(5+3*
a^2/b^2-2*n)*n/b^2-(3*a^4+a^2*b^2*(-n^2-2*n+6)+b^4*(n^2-4*n+3))*(-b^2)^(1/2
)/b^6)*(a+b*tan(d*x+c))^(1+n)/(1+a^2/b^2)^2/d/(1+n)/(a-(-b^2)^(1/2))+1/16*b
*hypergeom([1, 1+n],[2+n],(a+b*tan(d*x+c))/(a+(-b^2)^(1/2)))*(a*(5+3*a^2/b^
2-2*n)*n/b^2+(3*a^4+a^2*b^2*(-n^2-2*n+6)+b^4*(n^2-4*n+3))*(-b^2)^(1/2)/b^6)
*(a+b*tan(d*x+c))^(1+n)/(1+a^2/b^2)^2/d/(1+n)/(a+(-b^2)^(1/2))+1/4*cos(d*x+
c)^4*(b+a*tan(d*x+c))*(a+b*tan(d*x+c))^(1+n)/(a^2+b^2)/d+1/8*b*cos(d*x+c)^2
*(a+b*tan(d*x+c))^(1+n)*(b^2*(3-n)+a^2*(1+n)+a*b*(5+3*a^2/b^2-2*n)*tan(d*x+
c))/(a^2+b^2)^2/d
```

Rubi [A] time = 0.69, antiderivative size = 434, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {3506, 741, 823, 831, 68}

$$\frac{b\left(\frac{an\left(\frac{3a^2}{b^2}-2n+5\right)}{b^2}-\frac{\sqrt{-b^2}\left(a^2b^2\left(-n^2-2n+6\right)+3a^4+b^4\left(n^2-4n+3\right)\right)}{b^6}\right)(a+b\tan(c+dx))^{n+1}\,{}_2F_1\left(1,n+1;n+2;\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}}\right)}{16d(n+1)\left(\frac{a^2}{b^2}+1\right)^2\left(a-\sqrt{-b^2}\right)}+\frac{b\left(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^4*(a + b*Tan[c + d*x])^n,x]
```

```
[Out] (b*((a*(5 + (3*a^2)/b^2 - 2*n)*n)/b^2 - (Sqrt[-b^2]*(3*a^4 + a^2*b^2*(6 - 2
*n - n^2) + b^4*(3 - 4*n + n^2)))/b^6)*Hypergeometric2F1[1, 1 + n, 2 + n, (
a + b*Tan[c + d*x])/(a - Sqrt[-b^2])]*(a + b*Tan[c + d*x])^(1 + n))/(16*(1
+ a^2/b^2)^2*(a - Sqrt[-b^2])*d*(1 + n)) + (b*((a*(5 + (3*a^2)/b^2 - 2*n)*n
)/b^2 + (Sqrt[-b^2]*(3*a^4 + a^2*b^2*(6 - 2*n - n^2) + b^4*(3 - 4*n + n^2))
)/b^6)*Hypergeometric2F1[1, 1 + n, 2 + n, (a + b*Tan[c + d*x])/(a + Sqrt[-b
^2])]*(a + b*Tan[c + d*x])^(1 + n))/(16*(1 + a^2/b^2)^2*(a + Sqrt[-b^2])*d*
(1 + n)) + (Cos[c + d*x]^4*(b + a*Tan[c + d*x])*(a + b*Tan[c + d*x])^(1 + n
))/(4*(a^2 + b^2)*d) + (b*Cos[c + d*x]^2*(a + b*Tan[c + d*x])^(1 + n)*(b^2*
(3 - n) + a^2*(1 + n) + a*b*(5 + (3*a^2)/b^2 - 2*n)*Tan[c + d*x]))/(8*(a^2
+ b^2)^2*d)
```

Rule 68

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a
+ b*x))/(b*c - a*d))])/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]
 && NeQ[b*c - a*d, 0] &&  !IntegerQ[m] && IntegerQ[n]
```

Rule 741

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> -Simp
[((d + e*x)^(m + 1)*(a*e + c*d*x)*(a + c*x^2)^(p + 1))/(2*a*(p + 1)*(c*d^2
+ a*e^2)), x] + Dist[1/(2*a*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*Simp[
c*d^2*(2*p + 3) + a*e^2*(m + 2*p + 3) + c*e*d*(m + 2*p + 4)*x, x]*(a + c*x^
2)^(p + 1), x], x] /; FreeQ[{a, c, d, e, m}, x] && NeQ[c*d^2 + a*e^2, 0] &&
```

```
LtQ[p, -1] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 823

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p
_), x_Symbol] :> -Simp[((d + e*x)^(m + 1)*(f*a*c*e - a*g*c*d + c*(c*d*f + a
*e*g)*x)*(a + c*x^2)^(p + 1))/(2*a*c*(p + 1)*(c*d^2 + a*e^2)), x] + Dist[1/
(2*a*c*(p + 1)*(c*d^2 + a*e^2)), Int[(d + e*x)^m*(a + c*x^2)^(p + 1)*Simp[f
*(c^2*d^2*(2*p + 3) + a*c*e^2*(m + 2*p + 3)) - a*c*d*e*g*m + c*e*(c*d*f + a
*e*g)*(m + 2*p + 4)*x, x], x], x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*
d^2 + a*e^2, 0] && LtQ[p, -1] && (IntegerQ[m] || IntegerQ[p] || IntegersQ[2
*m, 2*p])
```

Rule 831

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_) + (c_.)*(x_)^2),
 x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m, (f + g*x)/(a + c*x^2), x], x
] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !RationalQ[m
]
```

Rule 3506

```
Int[sec[(e_.) + (f_.)*(x_)]^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(n_
), x_Symbol] :> Dist[1/(b*f), Subst[Int[(a + x)^n*(1 + x^2/b^2)^(m/2 - 1),
x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, e, f, n}, x] && NeQ[a^2 + b^2, 0
] && IntegerQ[m/2]
```

Rubi steps

$$\int \cos^4(c+dx)(a+b\tan(c+dx))^n\,dx = \frac{\text{Subst}\left(\int \frac{(a+x)^n}{\left(1+\frac{x^2}{b^2}\right)^3}\,dx, x, b\tan(c+dx)\right)}{bd}$$

$$= \frac{\cos^4(c+dx)(b+a\tan(c+dx))(a+b\tan(c+dx))^{1+n}}{4\left(a^2+b^2\right)d} - \frac{b\,\text{Subst}\left(\int \frac{(a+x}{}\right.}{}$$

$$= \frac{\cos^4(c+dx)(b+a\tan(c+dx))(a+b\tan(c+dx))^{1+n}}{4\left(a^2+b^2\right)d} + \frac{b\cos^2(c+dx)(}{}$$

$$= \frac{\cos^4(c+dx)(b+a\tan(c+dx))(a+b\tan(c+dx))^{1+n}}{4\left(a^2+b^2\right)d} + \frac{b\cos^2(c+dx)(}{}$$

$$= \frac{\cos^4(c+dx)(b+a\tan(c+dx))(a+b\tan(c+dx))^{1+n}}{4\left(a^2+b^2\right)d} + \frac{b\cos^2(c+dx)(}{}$$

$$= \frac{b^5\left(\frac{a\left(5+\frac{3a^2}{b^2}-2n\right)n}{b^2} - \frac{\sqrt{-b^2}\left(3a^4+a^2b^2\left(6-2n-n^2\right)+b^4\left(3-4n+n^2\right)\right)}{b^6}\right){}_2F_1\left(1,1+n;2+\right.}{16\left(a^2+b^2\right)^2\left(a-\sqrt{-b^2}\right)d(1+n)}$$

Mathematica [A] time = 4.58, size = 360, normalized size = 0.83

$$\frac{(a+b\tan(c+dx))^{n+1}\left(-\frac{2b\cos^2(c+dx)\left(-a\left(3a^2+b^2(5-2n)\right)\tan(c+dx)-a^2b(n+1)+b^3(n-3)\right)}{a^2+b^2} + \frac{\left(ab^2n\left(3a^2+b^2(5-2n)\right)+\sqrt{-b^2}\left(-3a^4+a^2b^2\left(n^2+2n-6\right)-\right.\right.}{a-\sqrt{-b^2}}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Cos[c + d*x]^4*(a + b*Tan[c + d*x])^n,x]
```

```
[Out] ((a + b*Tan[c + d*x])^(1 + n)*((((a*b^2*(3*a^2 + b^2*(5 - 2*n))*n + Sqrt[-b
^2]*(-3*a^4 - b^4*(3 - 4*n + n^2) + a^2*b^2*(-6 + 2*n + n^2)))*Hypergeometr
ic2F1[1, 1 + n, 2 + n, (a + b*Tan[c + d*x])/(a - Sqrt[-b^2])])/(a - Sqrt[-b
^2]) + ((a*b^2*(3*a^2 + b^2*(5 - 2*n))*n + Sqrt[-b^2]*(3*a^4 + b^4*(3 - 4*n
 + n^2) - a^2*b^2*(-6 + 2*n + n^2)))*Hypergeometric2F1[1, 1 + n, 2 + n, (a
+ b*Tan[c + d*x])/(a + Sqrt[-b^2])])/(a + Sqrt[-b^2]))/((a^2 + b^2)*(1 + n)
) + 4*b*Cos[c + d*x]^4*(b + a*Tan[c + d*x]) - (2*b*Cos[c + d*x]^2*(b^3*(-3
```

```
+ n) - a^2*b*(1 + n) - a*(3*a^2 + b^2*(5 - 2*n))*Tan[c + d*x]))/(a^2 + b^2)
))/(16*b*(a^2 + b^2)*d)
```

fricas [F] time = 0.57, size = 0, normalized size = 0.00

$$\text{integral}\left((b\tan(dx+c)+a)^{n}\cos(dx+c)^{4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+b*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral((b*tan(d*x + c) + a)^n*cos(d*x + c)^4, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+b*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:Evaluation time: 0.45Unable to divide, perha
ps due to rounding error%%%{1048576,[2,0,10,17,20,20]%%%}+%%%{-10485760,[2,
0,10,17,20,18]%%%}+%%%{47185920,[2,0,10,17,20,16]%%%}+%%%{-125829120,[2,0,1
0,17,20,14]%%%}+%%%{220200960,[2,0,10,17,20,12]%%%}+%%%{-264241152,[2,0,10,
17,20,10]%%%}+%%%{220200960,[2,0,10,17,20,8]%%%}+%%%{-125829120,[2,0,10,17,
20,6]%%%}+%%%{47185920,[2,0,10,17,20,4]%%%}+%%%{-10485760,[2,0,10,17,20,2]%
%%}+%%%{1048576,[2,0,10,17,20,0]%%%}+%%%{3145728*i,[2,0,10,16,21,20]%%%}+%%
%{-31457280*i,[2,0,10,16,21,18]%%%}+%%%{141557760*i,[2,0,10,16,21,16]%%%}+%
%%{-377487360*i,[2,0,10,16,21,14]%%%}+%%%{660602880*i,[2,0,10,16,21,12]%%%}
+%%%{-792723456*i,[2,0,10,16,21,10]%%%}+%%%{660602880*i,[2,0,10,16,21,8]%%%
}+%%%{-377487360*i,[2,0,10,16,21,6]%%%}+%%%{141557760*i,[2,0,10,16,21,4]%%%
}+%%%{-31457280*i,[2,0,10,16,21,2]%%%}+%%%{3145728*i,[2,0,10,16,21,0]%%%}+%
%%{4194304,[2,0,10,15,22,20]%%%}+%%%{-41943040,[2,0,10,15,22,18]%%%}+%%%{18
8743680,[2,0,10,15,22,16]%%%}+%%%{-503316480,[2,0,10,15,22,14]%%%}+%%%{8808
03840,[2,0,10,15,22,12]%%%}+%%%{-1056964608,[2,0,10,15,22,10]%%%}+%%%{88080
3840,[2,0,10,15,22,8]%%%}+%%%{-503316480,[2,0,10,15,22,6]%%%}+%%%{188743680
,[2,0,10,15,22,4]%%%}+%%%{-41943040,[2,0,10,15,22,2]%%%}+%%%{4194304,[2,0,1
0,15,22,0]%%%}+%%%{20971520*i,[2,0,10,14,23,20]%%%}+%%%{-209715200*i,[2,0,1
0,14,23,18]%%%}+%%%{943718400*i,[2,0,10,14,23,16]%%%}+%%%{-2516582400*i,[2,
0,10,14,23,14]%%%}+%%%{4404019200*i,[2,0,10,14,23,12]%%%}+%%%{-5284823040*i
,[2,0,10,14,23,10]%%%}+%%%{4404019200*i,[2,0,10,14,23,8]%%%}+%%%{-251658240
0*i,[2,0,10,14,23,6]%%%}+%%%{943718400*i,[2,0,10,14,23,4]%%%}+%%%{-20971520
0*i,[2,0,10,14,23,2]%%%}+%%%{20971520*i,[2,0,10,14,23,0]%%%}+%%%{58720256*i
,[2,0,10,12,25,20]%%%}+%%%{-587202560*i,[2,0,10,12,25,18]%%%}+%%%{264241152
0*i,[2,0,10,12,25,16]%%%}+%%%{-7046430720*i,[2,0,10,12,25,14]%%%}+%%%{12331
253760*i,[2,0,10,12,25,12]%%%}+%%%{-14797504512*i,[2,0,10,12,25,10]%%%}+%%%
{12331253760*i,[2,0,10,12,25,8]%%%}+%%%{-7046430720*i,[2,0,10,12,25,6]%%%}+
%%%{2642411520*i,[2,0,10,12,25,4]%%%}+%%%{-587202560*i,[2,0,10,12,25,2]%%%}
+%%%{58720256*i,[2,0,10,12,25,0]%%%}+%%%{-29360128,[2,0,10,11,26,20]%%%}+%%
%{293601280,[2,0,10,11,26,18]%%%}+%%%{-1321205760,[2,0,10,11,26,16]%%%}+%%%
{3523215360,[2,0,10,11,26,14]%%%}+%%%{-6165626880,[2,0,10,11,26,12]%%%}+%%%
{7398752256,[2,0,10,11,26,10]%%%}+%%%{-6165626880,[2,0,10,11,26,8]%%%}+%%%{
3523215360,[2,0,10,11,26,6]%%%}+%%%{-1321205760,[2,0,10,11,26,4]%%%}+%%%{29
3601280,[2,0,10,11,26,2]%%%}+%%%{-29360128,[2,0,10,11,26,0]%%%}+%%%{8808038
4*i,[2,0,10,10,27,20]%%%}+%%%{-880803840*i,[2,0,10,10,27,18]%%%}+%%%{396361
7280*i,[2,0,10,10,27,16]%%%}+%%%{-10569646080*i,[2,0,10,10,27,14]%%%}+%%%{1
8496880640*i,[2,0,10,10,27,12]%%%}+%%%{-22196256768*i,[2,0,10,10,27,10]%%%}
+%%%{18496880640*i,[2,0,10,10,27,8]%%%}+%%%{-10569646080*i,[2,0,10,10,27,6]
%%%}+%%%{3963617280*i,[2,0,10,10,27,4]%%%}+%%%{-880803840*i,[2,0,10,10,27,2
```

]%%%}+%%%{88080384*i,[2,0,10,10,27,0]%%%}+%%%{-73400320,[2,0,10,9,28,20]%%%
}+%%%{734003200,[2,0,10,9,28,18]%%%}+%%%{-3303014400,[2,0,10,9,28,16]%%%}+%
%%{8808038400,[2,0,10,9,28,14]%%%}+%%%{-15414067200,[2,0,10,9,28,12]%%%}+%%
%{18496880640,[2,0,10,9,28,10]%%%}+%%%{-15414067200,[2,0,10,9,28,8]%%%}+%%%
{8808038400,[2,0,10,9,28,6]%%%}+%%%{-3303014400,[2,0,10,9,28,4]%%%}+%%%{734
003200,[2,0,10,9,28,2]%%%}+%%%{-73400320,[2,0,10,9,28,0]%%%}+%%%{73400320*i
,[2,0,10,8,29,20]%%%}+%%%{-734003200*i,[2,0,10,8,29,18]%%%}+%%%{3303014400*
i,[2,0,10,8,29,16]%%%}+%%%{-8808038400*i,[2,0,10,8,29,14]%%%}+%%%{154140672
00*i,[2,0,10,8,29,12]%%%}+%%%{-18496880640*i,[2,0,10,8,29,10]%%%}+%%%{15414
067200*i,[2,0,10,8,29,8]%%%}+%%%{-8808038400*i,[2,0,10,8,29,6]%%%}+%%%{3303
014400*i,[2,0,10,8,29,4]%%%}+%%%{-734003200*i,[2,0,10,8,29,2]%%%}+%%%{73400
320*i,[2,0,10,8,29,0]%%%}+%%%{-88080384,[2,0,10,7,30,20]%%%}+%%%{880803840,
[2,0,10,7,30,18]%%%}+%%%{-3963617280,[2,0,10,7,30,16]%%%}+%%%{10569646080,[
2,0,10,7,30,14]%%%}+%%%{-18496880640,[2,0,10,7,30,12]%%%}+%%%{22196256768,[
2,0,10,7,30,10]%%%}+%%%{-18496880640,[2,0,10,7,30,8]%%%}+%%%{10569646080,[2
,0,10,7,30,6]%%%}+%%%{-3963617280,[2,0,10,7,30,4]%%%}+%%%{880803840,[2,0,10
,7,30,2]%%%}+%%%{-88080384,[2,0,10,7,30,0]%%%}+%%%{29360128*i,[2,0,10,6,31,
20]%%%}+%%%{-293601280*i,[2,0,10,6,31,18]%%%}+%%%{1321205760*i,[2,0,10,6,31
,16]%%%}+%%%{-3523215360*i,[2,0,10,6,31,14]%%%}+%%%{6165626880*i,[2,0,10,6,
31,12]%%%}+%%%{-7398752256*i,[2,0,10,6,31,10]%%%}+%%%{6165626880*i,[2,0,10,
6,31,8]%%%}+%%%{-3523215360*i,[2,0,10,6,31,6]%%%}+%%%{1321205760*i,[2,0,10,
6,31,4]%%%}+%%%{-293601280*i,[2,0,10,6,31,2]%%%}+%%%{29360128*i,[2,0,10,6,3
1,0]%%%}+%%%{-58720256,[2,0,10,5,32,20]%%%}+%%%{587202560,[2,0,10,5,32,18]%
%%}+%%%{-2642411520,[2,0,10,5,32,16]%%%}+%%%{7046430720,[2,0,10,5,32,14]%%%
}+%%%{-12331253760,[2,0,10,5,32,12]%%%}+%%%{14797504512,[2,0,10,5,32,10]%%%
}+%%%{-12331253760,[2,0,10,5,32,8]%%%}+%%%{7046430720,[2,0,10,5,32,6]%%%}+%
%%{-2642411520,[2,0,10,5,32,4]%%%}+%%%{587202560,[2,0,10,5,32,2]%%%}+%%%{-5
8720256,[2,0,10,5,32,0]%%%}+%%%{-20971520,[2,0,10,3,34,20]%%%}+%%%{20971520
0,[2,0,10,3,34,18]%%%}+%%%{-943718400,[2,0,10,3,34,16]%%%}+%%%{2516582400,[
2,0,10,3,34,14]%%%}+%%%{-4404019200,[2,0,10,3,34,12]%%%}+%%%{5284823040,[2,
0,10,3,34,10]%%%}+%%%{-4404019200,[2,0,10,3,34,8]%%%}+%%%{2516582400,[2,0,1
0,3,34,6]%%%}+%%%{-943718400,[2,0,10,3,34,4]%%%}+%%%{209715200,[2,0,10,3,34
,2]%%%}+%%%{-20971520,[2,0,10,3,34,0]%%%}+%%%{-4194304*i,[2,0,10,2,35,20]%%
%}+%%%{41943040*i,[2,0,10,2,35,18]%%%}+%%%{-188743680*i,[2,0,10,2,35,16]%%%
}+%%%{503316480*i,[2,0,10,2,35,14]%%%}+%%%{-880803840*i,[2,0,10,2,35,12]%%%
}+%%%{1056964608*i,[2,0,10,2,35,10]%%%}+%%%{-880803840*i,[2,0,10,2,35,8]%%%
}+%%%{503316480*i,[2,0,10,2,35,6]%%%}+%%%{-188743680*i,[2,0,10,2,35,4]%%%}+
%%%{41943040*i,[2,0,10,2,35,2]%%%}+%%%{-4194304*i,[2,0,10,2,35,0]%%%}+%%%{-
3145728,[2,0,10,1,36,20]%%%}+%%%{31457280,[2,0,10,1,36,18]%%%}+%%%{-1415577
60,[2,0,10,1,36,16]%%%}+%%%{377487360,[2,0,10,1,36,14]%%%}+%%%{-660602880,[
2,0,10,1,36,12]%%%}+%%%{792723456,[2,0,10,1,36,10]%%%}+%%%{-660602880,[2,0,
10,1,36,8]%%%}+%%%{377487360,[2,0,10,1,36,6]%%%}+%%%{-141557760,[2,0,10,1,3
6,4]%%%}+%%%{31457280,[2,0,10,1,36,2]%%%}+%%%{-3145728,[2,0,10,1,36,0]%%%}+
%%%{-1048576*i,[2,0,10,0,37,20]%%%}+%%%{10485760*i,[2,0,10,0,37,18]%%%}+%%%
{-47185920*i,[2,0,10,0,37,16]%%%}+%%%{125829120*i,[2,0,10,0,37,14]%%%}+%%%{
-220200960*i,[2,0,10,0,37,12]%%%}+%%%{264241152*i,[2,0,10,0,37,10]%%%}+%%%{
-220200960*i,[2,0,10,0,37,8]%%%}+%%%{125829120*i,[2,0,10,0,37,6]%%%}+%%%{-4
7185920*i,[2,0,10,0,37,4]%%%}+%%%{10485760*i,[2,0,10,0,37,2]%%%}+%%%{-10485
76*i,[2,0,10,0,37,0]%%%}+%%%{2097152,[1,0,10,17,20,20]%%%}+%%%{-20971520,[1
,0,10,17,20,18]%%%}+%%%{94371840,[1,0,10,17,20,16]%%%}+%%%{-251658240,[1,0,
10,17,20,14]%%%}+%%%{440401920,[1,0,10,17,20,12]%%%}+%%%{-528482304,[1,0,10
,17,20,10]%%%}+%%%{440401920,[1,0,10,17,20,8]%%%}+%%%{-251658240,[1,0,10,17
,20,6]%%%}+%%%{94371840,[1,0,10,17,20,4]%%%}+%%%{-20971520,[1,0,10,17,20,2]
%%%}+%%%{2097152,[1,0,10,17,20,0]%%%}+%%%{4194304*i,[1,0,10,16,21,20]%%%}+%
%%{-41943040*i,[1,0,10,16,21,18]%%%}+%%%{188743680*i,[1,0,10,16,21,16]%%%}+
%%%{-503316480*i,[1,0,10,16,21,14]%%%}+%%%{880803840*i,[1,0,10,16,21,12]%%%
}+%%%{-1056964608*i,[1,0,10,16,21,10]%%%}+%%%{880803840*i,[1,0,10,16,21,8]%
%%}+%%%{-503316480*i,[1,0,10,16,21,6]%%%}+%%%{188743680*i,[1,0,10,16,21,4]%
%%}+%%%{-41943040*i,[1,0,10,16,21,2]%%%}+%%%{4194304*i,[1,0,10,16,21,0]%%%}

+%%%{16777216,[1,0,10,15,22,20]%%%}+%%%{-167772160,[1,0,10,15,22,18]%%%}+%%
%{754974720,[1,0,10,15,22,16]%%%}+%%%{-2013265920,[1,0,10,15,22,14]%%%}+%%%
{3523215360,[1,0,10,15,22,12]%%%}+%%%{-4227858432,[1,0,10,15,22,10]%%%}+%%%
{3523215360,[1,0,10,15,22,8]%%%}+%%%{-2013265920,[1,0,10,15,22,6]%%%}+%%%{7
54974720,[1,0,10,15,22,4]%%%}+%%%{-167772160,[1,0,10,15,22,2]%%%}+%%%{16777
216,[1,0,10,15,22,0]%%%}+%%%{41943040*i,[1,0,10,14,23,20]%%%}+%%%{-41943040
0*i,[1,0,10,14,23,18]%%%}+%%%{1887436800*i,[1,0,10,14,23,16]%%%}+%%%{-50331
64800*i,[1,0,10,14,23,14]%%%}+%%%{8808038400*i,[1,0,10,14,23,12]%%%}+%%%{-1
0569646080*i,[1,0,10,14,23,10]%%%}+%%%{8808038400*i,[1,0,10,14,23,8]%%%}+%%
%{-5033164800*i,[1,0,10,14,23,6]%%%}+%%%{1887436800*i,[1,0,10,14,23,4]%%%}+
%%%{-419430400*i,[1,0,10,14,23,2]%%%}+%%%{41943040*i,[1,0,10,14,23,0]%%%}+%
%%{41943040,[1,0,10,13,24,20]%%%}+%%%{-419430400,[1,0,10,13,24,18]%%%}+%%%{
1887436800,[1,0,10,13,24,16]%%%}+%%%{-5033164800,[1,0,10,13,24,14]%%%}+%%%{
8808038400,[1,0,10,13,24,12]%%%}+%%%{-10569646080,[1,0,10,13,24,10]%%%}+%%%
{8808038400,[1,0,10,13,24,8]%%%}+%%%{-5033164800,[1,0,10,13,24,6]%%%}+%%%{1
887436800,[1,0,10,13,24,4]%%%}+%%%{-419430400,[1,0,10,13,24,2]%%%}+%%%{4194
3040,[1,0,10,13,24,0]%%%}+%%%{159383552*i,[1,0,10,12,25,20]%%%}+%%%{-159383
5520*i,[1,0,10,12,25,18]%%%}+%%%{7172259840*i,[1,0,10,12,25,16]%%%}+%%%{-19
126026240*i,[1,0,10,12,25,14]%%%}+%%%{33470545920*i,[1,0,10,12,25,12]%%%}+%
%%{-40164655104*i,[1,0,10,12,25,10]%%%}+%%%{33470545920*i,[1,0,10,12,25,8]%
%%}+%%%{-19126026240*i,[1,0,10,12,25,6]%%%}+%%%{7172259840*i,[1,0,10,12,25,
4]%%%}+%%%{-1593835520*i,[1,0,10,12,25,2]%%%}+%%%{159383552*i,[1,0,10,12,25
,0]%%%}+%%%{16777216,[1,0,10,11,26,20]%%%}+%%%{-167772160,[1,0,10,11,26,18]
%%%}+%%%{754974720,[1,0,10,11,26,16]%%%}+%%%{-2013265920,[1,0,10,11,26,14]%
%%}+%%%{3523215360,[1,0,10,11,26,12]%%%}+%%%{-4227858432,[1,0,10,11,26,10]%
%%}+%%%{3523215360,[1,0,10,11,26,8]%%%}+%%%{-2013265920,[1,0,10,11,26,6]%%%
}+%%%{754974720,[1,0,10,11,26,4]%%%}+%%%{-167772160,[1,0,10,11,26,2]%%%}+%%
%{16777216,[1,0,10,11,26,0]%%%}+%%%{310378496*i,[1,0,10,10,27,20]%%%}+%%%{-
3103784960*i,[1,0,10,10,27,18]%%%}+%%%{13967032320*i,[1,0,10,10,27,16]%%%}+
%%%{-37245419520*i,[1,0,10,10,27,14]%%%}+%%%{65179484160*i,[1,0,10,10,27,12
]%%%}+%%%{-78215380992*i,[1,0,10,10,27,10]%%%}+%%%{65179484160*i,[1,0,10,10
,27,8]%%%}+%%%{-37245419520*i,[1,0,10,10,27,6]%%%}+%%%{13967032320*i,[1,0,1
0,10,27,4]%%%}+%%%{-3103784960*i,[1,0,10,10,27,2]%%%}+%%%{310378496*i,[1,0,
10,10,27,0]%%%}+%%%{-104857600,[1,0,10,9,28,20]%%%}+%%%{1048576000,[1,0,10,
9,28,18]%%%}+%%%{-4718592000,[1,0,10,9,28,16]%%%}+%%%{12582912000,[1,0,10,9
,28,14]%%%}+%%%{-22020096000,[1,0,10,9,28,12]%%%}+%%%{26424115200,[1,0,10,9
,28,10]%%%}+%%%{-22020096000,[1,0,10,9,28,8]%%%}+%%%{12582912000,[1,0,10,9,
28,6]%%%}+%%%{-4718592000,[1,0,10,9,28,4]%%%}+%%%{1048576000,[1,0,10,9,28,2
]%%%}+%%%{-104857600,[1,0,10,9,28,0]%%%}+%%%{335544320*i,[1,0,10,8,29,20]%%
%}+%%%{-3355443200*i,[1,0,10,8,29,18]%%%}+%%%{15099494400*i,[1,0,10,8,29,16
]%%%}+%%%{-40265318400*i,[1,0,10,8,29,14]%%%}+%%%{70464307200*i,[1,0,10,8,2
9,12]%%%}+%%%{-84557168640*i,[1,0,10,8,29,10]%%%}+%%%{70464307200*i,[1,0,10
,8,29,8]%%%}+%%%{-40265318400*i,[1,0,10,8,29,6]%%%}+%%%{15099494400*i,[1,0,
10,8,29,4]%%%}+%%%{-3355443200*i,[1,0,10,8,29,2]%%%}+%%%{335544320*i,[1,0,1
0,8,29,0]%%%}+%%%{-218103808,[1,0,10,7,30,20]%%%}+%%%{2181038080,[1,0,10,7,
30,18]%%%}+%%%{-9814671360,[1,0,10,7,30,16]%%%}+%%%{26172456960,[1,0,10,7,3
0,14]%%%}+%%%{-45801799680,[1,0,10,7,30,12]%%%}+%%%{54962159616,[1,0,10,7,3
0,10]%%%}+%%%{-45801799680,[1,0,10,7,30,8]%%%}+%%%{26172456960,[1,0,10,7,30
,6]%%%}+%%%{-9814671360,[1,0,10,7,30,4]%%%}+%%%{2181038080,[1,0,10,7,30,2]%
%%}+%%%{-218103808,[1,0,10,7,30,0]%%%}+%%%{192937984*i,[1,0,10,6,31,20]%%%}
+%%%{-1929379840*i,[1,0,10,6,31,18]%%%}+%%%{8682209280*i,[1,0,10,6,31,16]%%
%}+%%%{-23152558080*i,[1,0,10,6,31,14]%%%}+%%%{40516976640*i,[1,0,10,6,31,1
2]%%%}+%%%{-48620371968*i,[1,0,10,6,31,10]%%%}+%%%{40516976640*i,[1,0,10,6,
31,8]%%%}+%%%{-23152558080*i,[1,0,10,6,31,6]%%%}+%%%{8682209280*i,[1,0,10,6
,31,4]%%%}+%%%{-1929379840*i,[1,0,10,6,31,2]%%%}+%%%{192937984*i,[1,0,10,6,
31,0]%%%}+%%%{-192937984,[1,0,10,5,32,20]%%%}+%%%{1929379840,[1,0,10,5,32,1
8]%%%}+%%%{-8682209280,[1,0,10,5,32,16]%%%}+%%%{23152558080,[1,0,10,5,32,14
]%%%}+%%%{-40516976640,[1,0,10,5,32,12]%%%}+%%%{48620371968,[1,0,10,5,32,10
]%%%}+%%%{-40516976640,[1,0,10,5,32,8]%%%}+%%%{23152558080,[1,0,10,5,32,6]%

%%}+%%%{-8682209280,[1,0,10,5,32,4]%%%}+%%%{1929379840,[1,0,10,5,32,2]%%%}+
%%%{-192937984,[1,0,10,5,32,0]%%%}+%%%{41943040*i,[1,0,10,4,33,20]%%%}+%%%{
-419430400*i,[1,0,10,4,33,18]%%%}+%%%{1887436800*i,[1,0,10,4,33,16]%%%}+%%%
{-5033164800*i,[1,0,10,4,33,14]%%%}+%%%{8808038400*i,[1,0,10,4,33,12]%%%}+%
%%{-10569646080*i,[1,0,10,4,33,10]%%%}+%%%{8808038400*i,[1,0,10,4,33,8]%%%}
+%%%{-5033164800*i,[1,0,10,4,33,6]%%%}+%%%{1887436800*i,[1,0,10,4,33,4]%%%}
+%%%{-419430400*i,[1,0,10,4,33,2]%%%}+%%%{41943040*i,[1,0,10,4,33,0]%%%}+%%
%{-83886080,[1,0,10,3,34,20]%%%}+%%%{838860800,[1,0,10,3,34,18]%%%}+%%%{-37
74873600,[1,0,10,3,34,16]%%%}+%%%{10066329600,[1,0,10,3,34,14]%%%}+%%%{-176
16076800,[1,0,10,3,34,12]%%%}+%%%{21139292160,[1,0,10,3,34,10]%%%}+%%%{-176
16076800,[1,0,10,3,34,8]%%%}+%%%{10066329600,[1,0,10,3,34,6]%%%}+%%%{-37748
73600,[1,0,10,3,34,4]%%%}+%%%{838860800,[1,0,10,3,34,2]%%%}+%%%{-83886080,[
1,0,10,3,34,0]%%%}+%%%{-8388608*i,[1,0,10,2,35,20]%%%}+%%%{83886080*i,[1,0,
10,2,35,18]%%%}+%%%{-377487360*i,[1,0,10,2,35,16]%%%}+%%%{1006632960*i,[1,0
,10,2,35,14]%%%}+%%%{-1761607680*i,[1,0,10,2,35,12]%%%}+%%%{2113929216*i,[1
,0,10,2,35,10]%%%}+%%%{-1761607680*i,[1,0,10,2,35,8]%%%}+%%%{1006632960*i,[
1,0,10,2,35,6]%%%}+%%%{-377487360*i,[1,0,10,2,35,4]%%%}+%%%{83886080*i,[1,0
,10,2,35,2]%%%}+%%%{-8388608*i,[1,0,10,2,35,0]%%%}+%%%{-14680064,[1,0,10,1,
36,20]%%%}+%%%{146800640,[1,0,10,1,36,18]%%%}+%%%{-660602880,[1,0,10,1,36,1
6]%%%}+%%%{1761607680,[1,0,10,1,36,14]%%%}+%%%{-3082813440,[1,0,10,1,36,12]
%%%}+%%%{3699376128,[1,0,10,1,36,10]%%%}+%%%{-3082813440,[1,0,10,1,36,8]%%%
}+%%%{1761607680,[1,0,10,1,36,6]%%%}+%%%{-660602880,[1,0,10,1,36,4]%%%}+%%%
{146800640,[1,0,10,1,36,2]%%%}+%%%{-14680064,[1,0,10,1,36,0]%%%}+%%%{-41943
04*i,[1,0,10,0,37,20]%%%}+%%%{41943040*i,[1,0,10,0,37,18]%%%}+%%%{-18874368
0*i,[1,0,10,0,37,16]%%%}+%%%{503316480*i,[1,0,10,0,37,14]%%%}+%%%{-88080384
0*i,[1,0,10,0,37,12]%%%}+%%%{1056964608*i,[1,0,10,0,37,10]%%%}+%%%{-8808038
40*i,[1,0,10,0,37,8]%%%}+%%%{503316480*i,[1,0,10,0,37,6]%%%}+%%%{-188743680
*i,[1,0,10,0,37,4]%%%}+%%%{41943040*i,[1,0,10,0,37,2]%%%}+%%%{-4194304*i,[1
,0,10,0,37,0]%%%}+%%%{1048576,[0,0,10,17,20,20]%%%}+%%%{-10485760,[0,0,10,1
7,20,18]%%%}+%%%{47185920,[0,0,10,17,20,16]%%%}+%%%{-125829120,[0,0,10,17,2
0,14]%%%}+%%%{220200960,[0,0,10,17,20,12]%%%}+%%%{-264241152,[0,0,10,17,20,
10]%%%}+%%%{220200960,[0,0,10,17,20,8]%%%}+%%%{-125829120,[0,0,10,17,20,6]%
%%}+%%%{47185920,[0,0,10,17,20,4]%%%}+%%%{-10485760,[0,0,10,17,20,2]%%%}+%%
%{1048576,[0,0,10,17,20,0]%%%}+%%%{1048576*i,[0,0,10,16,21,20]%%%}+%%%{-104
85760*i,[0,0,10,16,21,18]%%%}+%%%{47185920*i,[0,0,10,16,21,16]%%%}+%%%{-125
829120*i,[0,0,10,16,21,14]%%%}+%%%{220200960*i,[0,0,10,16,21,12]%%%}+%%%{-2
64241152*i,[0,0,10,16,21,10]%%%}+%%%{220200960*i,[0,0,10,16,21,8]%%%}+%%%{-
125829120*i,[0,0,10,16,21,6]%%%}+%%%{47185920*i,[0,0,10,16,21,4]%%%}+%%%{-1
0485760*i,[0,0,10,16,21,2]%%%}+%%%{1048576*i,[0,0,10,16,21,0]%%%}+%%%{83886
08,[0,0,10,15,22,20]%%%}+%%%{8388608,[0,0,10,15,22,19]%%%}+%%%{-92274688,[0
,0,10,15,22,18]%%%}+%%%{-75497472,[0,0,10,15,22,17]%%%}+%%%{452984832,[0,0,
10,15,22,16]%%%}+%%%{301989888,[0,0,10,15,22,15]%%%}+%%%{-1308622848,[0,0,1
0,15,22,14]%%%}+%%%{-704643072,[0,0,10,15,22,13]%%%}+%%%{2466250752,[0,0,10
,15,22,12]%%%}+%%%{1056964608,[0,0,10,15,22,11]%%%}+%%%{-3170893824,[0,0,10
,15,22,10]%%%}+%%%{-1056964608,[0,0,10,15,22,9]%%%}+%%%{2818572288,[0,0,10,
15,22,8]%%%}+%%%{704643072,[0,0,10,15,22,7]%%%}+%%%{-1711276032,[0,0,10,15,
22,6]%%%}+%%%{-301989888,[0,0,10,15,22,5]%%%}+%%%{679477248,[0,0,10,15,22,4
]%%%}+%%%{75497472,[0,0,10,15,22,3]%%%}+%%%{-159383552,[0,0,10,15,22,2]%%%}
+%%%{-8388608,[0,0,10,15,22,1]%%%}+%%%{16777216,[0,0,10,15,22,0]%%%}+%%%{83
88608*i,[0,0,10,14,23,20]%%%}+%%%{25165824*i,[0,0,10,14,23,19]%%%}+%%%{-109
051904*i,[0,0,10,14,23,18]%%%}+%%%{-226492416*i,[0,0,10,14,23,17]%%%}+%%%{6
03979776*i,[0,0,10,14,23,16]%%%}+%%%{905969664*i,[0,0,10,14,23,15]%%%}+%%%{
-1912602624*i,[0,0,10,14,23,14]%%%}+%%%{-2113929216*i,[0,0,10,14,23,13]%%%}
+%%%{3875536896*i,[0,0,10,14,23,12]%%%}+%%%{3170893824*i,[0,0,10,14,23,11]%
%%}+%%%{-5284823040*i,[0,0,10,14,23,10]%%%}+%%%{-3170893824*i,[0,0,10,14,23
,9]%%%}+%%%{4932501504*i,[0,0,10,14,23,8]%%%}+%%%{2113929216*i,[0,0,10,14,2
3,7]%%%}+%%%{-3120562176*i,[0,0,10,14,23,6]%%%}+%%%{-905969664*i,[0,0,10,14
,23,5]%%%}+%%%{1283457024*i,[0,0,10,14,23,4]%%%}+%%%{226492416*i,[0,0,10,14
,23,3]%%%}+%%%{-310378496*i,[0,0,10,14,23,2]%%%}+%%%{-25165824*i,[0,0,10,14

,23,1]%%%}+%%%{33554432*i,[0,0,10,14,23,0]%%%}+%%%{29360128,[0,0,10,13,24,2
0]%%%}+%%%{25165824,[0,0,10,13,24,19]%%%}+%%%{-318767104,[0,0,10,13,24,18]%
%%}+%%%{-226492416,[0,0,10,13,24,17]%%%}+%%%{1547698176,[0,0,10,13,24,16]%%
%}+%%%{905969664,[0,0,10,13,24,15]%%%}+%%%{-4429185024,[0,0,10,13,24,14]%%%
}+%%%{-2113929216,[0,0,10,13,24,13]%%%}+%%%{8279556096,[0,0,10,13,24,12]%%%
}+%%%{3170893824,[0,0,10,13,24,11]%%%}+%%%{-10569646080,[0,0,10,13,24,10]%%
%}+%%%{-3170893824,[0,0,10,13,24,9]%%%}+%%%{9336520704,[0,0,10,13,24,8]%%%}
+%%%{2113929216,[0,0,10,13,24,7]%%%}+%%%{-5637144576,[0,0,10,13,24,6]%%%}+%
%%{-905969664,[0,0,10,13,24,5]%%%}+%%%{2227175424,[0,0,10,13,24,4]%%%}+%%%{
226492416,[0,0,10,13,24,3]%%%}+%%%{-520093696,[0,0,10,13,24,2]%%%}+%%%{-251
65824,[0,0,10,13,24,1]%%%}+%%%{54525952,[0,0,10,13,24,0]%%%}+%%%{29360128*i
,[0,0,10,12,25,20]%%%}+%%%{142606336*i,[0,0,10,12,25,19]%%%}+%%%{-436207616
*i,[0,0,10,12,25,18]%%%}+%%%{-1283457024*i,[0,0,10,12,25,17]%%%}+%%%{260466
2784*i,[0,0,10,12,25,16]%%%}+%%%{5133828096*i,[0,0,10,12,25,15]%%%}+%%%{-86
57043456*i,[0,0,10,12,25,14]%%%}+%%%{-11978932224*i,[0,0,10,12,25,13]%%%}+%
%%{18144559104*i,[0,0,10,12,25,12]%%%}+%%%{17968398336*i,[0,0,10,12,25,11]%
%%}+%%%{-25367150592*i,[0,0,10,12,25,10]%%%}+%%%{-17968398336*i,[0,0,10,12,
25,9]%%%}+%%%{24134025216*i,[0,0,10,12,25,8]%%%}+%%%{11978932224*i,[0,0,10,
12,25,7]%%%}+%%%{-15502147584*i,[0,0,10,12,25,6]%%%}+%%%{-5133828096*i,[0,0
,10,12,25,5]%%%}+%%%{6455033856*i,[0,0,10,12,25,4]%%%}+%%%{1283457024*i,[0,
0,10,12,25,3]%%%}+%%%{-1577058304*i,[0,0,10,12,25,2]%%%}+%%%{-142606336*i,[
0,0,10,12,25,1]%%%}+%%%{171966464*i,[0,0,10,12,25,0]%%%}+%%%{58720256,[0,0,
10,11,26,20]%%%}+%%%{-25165824,[0,0,10,11,26,19]%%%}+%%%{-562036736,[0,0,10
,11,26,18]%%%}+%%%{226492416,[0,0,10,11,26,17]%%%}+%%%{2415919104,[0,0,10,1
1,26,16]%%%}+%%%{-905969664,[0,0,10,11,26,15]%%%}+%%%{-6140461056,[0,0,10,1
1,26,14]%%%}+%%%{2113929216,[0,0,10,11,26,13]%%%}+%%%{10217324544,[0,0,10,1
1,26,12]%%%}+%%%{-3170893824,[0,0,10,11,26,11]%%%}+%%%{-11626610688,[0,0,10
,11,26,10]%%%}+%%%{3170893824,[0,0,10,11,26,9]%%%}+%%%{9160359936,[0,0,10,1
1,26,8]%%%}+%%%{-2113929216,[0,0,10,11,26,7]%%%}+%%%{-4932501504,[0,0,10,11
,26,6]%%%}+%%%{905969664,[0,0,10,11,26,5]%%%}+%%%{1736441856,[0,0,10,11,26,
4]%%%}+%%%{-226492416,[0,0,10,11,26,3]%%%}+%%%{-360710144,[0,0,10,11,26,2]%
%%}+%%%{25165824,[0,0,10,11,26,1]%%%}+%%%{33554432,[0,0,10,11,26,0]%%%}+%%%
{58720256*i,[0,0,10,10,27,20]%%%}+%%%{327155712*i,[0,0,10,10,27,19]%%%}+%%%
{-914358272*i,[0,0,10,10,27,18]%%%}+%%%{-2944401408*i,[0,0,10,10,27,17]%%%}
+%%%{5586812928*i,[0,0,10,10,27,16]%%%}+%%%{11777605632*i,[0,0,10,10,27,15]
%%%}+%%%{-18824036352*i,[0,0,10,10,27,14]%%%}+%%%{-27481079808*i,[0,0,10,10
,27,13]%%%}+%%%{39812333568*i,[0,0,10,10,27,12]%%%}+%%%{41221619712*i,[0,0,
10,10,27,11]%%%}+%%%{-56019124224*i,[0,0,10,10,27,10]%%%}+%%%{-41221619712*
i,[0,0,10,10,27,9]%%%}+%%%{53552873472*i,[0,0,10,10,27,8]%%%}+%%%{274810798
08*i,[0,0,10,10,27,7]%%%}+%%%{-34527510528*i,[0,0,10,10,27,6]%%%}+%%%{-1177
7605632*i,[0,0,10,10,27,5]%%%}+%%%{14420017152*i,[0,0,10,10,27,4]%%%}+%%%{2
944401408*i,[0,0,10,10,27,3]%%%}+%%%{-3531603968*i,[0,0,10,10,27,2]%%%}+%%%
{-327155712*i,[0,0,10,10,27,1]%%%}+%%%{385875968*i,[0,0,10,10,27,0]%%%}+%%%
{73400320,[0,0,10,9,28,20]%%%}+%%%{-209715200,[0,0,10,9,28,19]%%%}+%%%{-524
288000,[0,0,10,9,28,18]%%%}+%%%{1887436800,[0,0,10,9,28,17]%%%}+%%%{1415577
600,[0,0,10,9,28,16]%%%}+%%%{-7549747200,[0,0,10,9,28,15]%%%}+%%%{-12582912
00,[0,0,10,9,28,14]%%%}+%%%{17616076800,[0,0,10,9,28,13]%%%}+%%%{-220200960
0,[0,0,10,9,28,12]%%%}+%%%{-26424115200,[0,0,10,9,28,11]%%%}+%%%{7927234560
,[0,0,10,9,28,10]%%%}+%%%{26424115200,[0,0,10,9,28,9]%%%}+%%%{-11010048000,
[0,0,10,9,28,8]%%%}+%%%{-17616076800,[0,0,10,9,28,7]%%%}+%%%{8808038400,[0,
0,10,9,28,6]%%%}+%%%{7549747200,[0,0,10,9,28,5]%%%}+%%%{-4246732800,[0,0,10
,9,28,4]%%%}+%%%{-1887436800,[0,0,10,9,28,3]%%%}+%%%{1153433600,[0,0,10,9,2
8,2]%%%}+%%%{209715200,[0,0,10,9,28,1]%%%}+%%%{-136314880,[0,0,10,9,28,0]%%
%}+%%%{73400320*i,[0,0,10,8,29,20]%%%}+%%%{377487360*i,[0,0,10,8,29,19]%%%}
+%%%{-1111490560*i,[0,0,10,8,29,18]%%%}+%%%{-3397386240*i,[0,0,10,8,29,17]%
%%}+%%%{6700400640*i,[0,0,10,8,29,16]%%%}+%%%{13589544960*i,[0,0,10,8,29,15
]%%%}+%%%{-22397583360*i,[0,0,10,8,29,14]%%%}+%%%{-31708938240*i,[0,0,10,8,
29,13]%%%}+%%%{47123005440*i,[0,0,10,8,29,12]%%%}+%%%{47563407360*i,[0,0,10
,8,29,11]%%%}+%%%{-66060288000*i,[0,0,10,8,29,10]%%%}+%%%{-47563407360*i,[0

,0,10,8,29,9]%%%}+%%%{62977474560*i,[0,0,10,8,29,8]%%%}+%%%{31708938240*i,[
0,0,10,8,29,7]%%%}+%%%{-40516976640*i,[0,0,10,8,29,6]%%%}+%%%{-13589544960*
i,[0,0,10,8,29,5]%%%}+%%%{16892559360*i,[0,0,10,8,29,4]%%%}+%%%{3397386240*
i,[0,0,10,8,29,3]%%%}+%%%{-4131389440*i,[0,0,10,8,29,2]%%%}+%%%{-377487360*
i,[0,0,10,8,29,1]%%%}+%%%{450887680*i,[0,0,10,8,29,0]%%%}+%%%{58720256,[0,0
,10,7,30,20]%%%}+%%%{-377487360,[0,0,10,7,30,19]%%%}+%%%{-209715200,[0,0,10
,7,30,18]%%%}+%%%{3397386240,[0,0,10,7,30,17]%%%}+%%%{-754974720,[0,0,10,7,
30,16]%%%}+%%%{-13589544960,[0,0,10,7,30,15]%%%}+%%%{6543114240,[0,0,10,7,3
0,14]%%%}+%%%{31708938240,[0,0,10,7,30,13]%%%}+%%%{-19377684480,[0,0,10,7,3
0,12]%%%}+%%%{-47563407360,[0,0,10,7,30,11]%%%}+%%%{32765902848,[0,0,10,7,3
0,10]%%%}+%%%{47563407360,[0,0,10,7,30,9]%%%}+%%%{-35232153600,[0,0,10,7,30
,8]%%%}+%%%{-31708938240,[0,0,10,7,30,7]%%%}+%%%{24662507520,[0,0,10,7,30,6
]%%%}+%%%{13589544960,[0,0,10,7,30,5]%%%}+%%%{-10947133440,[0,0,10,7,30,4]%
%%}+%%%{-3397386240,[0,0,10,7,30,3]%%%}+%%%{2810183680,[0,0,10,7,30,2]%%%}+
%%%{377487360,[0,0,10,7,30,1]%%%}+%%%{-318767104,[0,0,10,7,30,0]%%%}+%%%{58
720256*i,[0,0,10,6,31,20]%%%}+%%%{209715200*i,[0,0,10,6,31,19]%%%}+%%%{-796
917760*i,[0,0,10,6,31,18]%%%}+%%%{-1887436800*i,[0,0,10,6,31,17]%%%}+%%%{45
29848320*i,[0,0,10,6,31,16]%%%}+%%%{7549747200*i,[0,0,10,6,31,15]%%%}+%%%{-
14596177920*i,[0,0,10,6,31,14]%%%}+%%%{-17616076800*i,[0,0,10,6,31,13]%%%}+
%%%{29947330560*i,[0,0,10,6,31,12]%%%}+%%%{26424115200*i,[0,0,10,6,31,11]%%
%}+%%%{-41221619712*i,[0,0,10,6,31,10]%%%}+%%%{-26424115200*i,[0,0,10,6,31,
9]%%%}+%%%{38755368960*i,[0,0,10,6,31,8]%%%}+%%%{17616076800*i,[0,0,10,6,31
,7]%%%}+%%%{-24662507520*i,[0,0,10,6,31,6]%%%}+%%%{-7549747200*i,[0,0,10,6,
31,5]%%%}+%%%{10192158720*i,[0,0,10,6,31,4]%%%}+%%%{1887436800*i,[0,0,10,6,
31,3]%%%}+%%%{-2474639360*i,[0,0,10,6,31,2]%%%}+%%%{-209715200*i,[0,0,10,6,
31,1]%%%}+%%%{268435456*i,[0,0,10,6,31,0]%%%}+%%%{29360128,[0,0,10,5,32,20]
%%%}+%%%{-327155712,[0,0,10,5,32,19]%%%}+%%%{33554432,[0,0,10,5,32,18]%%%}+
%%%{2944401408,[0,0,10,5,32,17]%%%}+%%%{-1623195648,[0,0,10,5,32,16]%%%}+%%
%{-11777605632,[0,0,10,5,32,15]%%%}+%%%{8254390272,[0,0,10,5,32,14]%%%}+%%%
{27481079808,[0,0,10,5,32,13]%%%}+%%%{-21315452928,[0,0,10,5,32,12]%%%}+%%%
{-41221619712,[0,0,10,5,32,11]%%%}+%%%{33822867456,[0,0,10,5,32,10]%%%}+%%%
{41221619712,[0,0,10,5,32,9]%%%}+%%%{-35055992832,[0,0,10,5,32,8]%%%}+%%%{-
27481079808,[0,0,10,5,32,7]%%%}+%%%{23957864448,[0,0,10,5,32,6]%%%}+%%%{117
77605632,[0,0,10,5,32,5]%%%}+%%%{-10456399872,[0,0,10,5,32,4]%%%}+%%%{-2944
401408,[0,0,10,5,32,3]%%%}+%%%{2650800128,[0,0,10,5,32,2]%%%}+%%%{327155712
,[0,0,10,5,32,1]%%%}+%%%{-297795584,[0,0,10,5,32,0]%%%}+%%%{29360128*i,[0,0
,10,4,33,20]%%%}+%%%{25165824*i,[0,0,10,4,33,19]%%%}+%%%{-318767104*i,[0,0,
10,4,33,18]%%%}+%%%{-226492416*i,[0,0,10,4,33,17]%%%}+%%%{1547698176*i,[0,0
,10,4,33,16]%%%}+%%%{905969664*i,[0,0,10,4,33,15]%%%}+%%%{-4429185024*i,[0,
0,10,4,33,14]%%%}+%%%{-2113929216*i,[0,0,10,4,33,13]%%%}+%%%{8279556096*i,[
0,0,10,4,33,12]%%%}+%%%{3170893824*i,[0,0,10,4,33,11]%%%}+%%%{-10569646080*
i,[0,0,10,4,33,10]%%%}+%%%{-3170893824*i,[0,0,10,4,33,9]%%%}+%%%{9336520704
*i,[0,0,10,4,33,8]%%%}+%%%{2113929216*i,[0,0,10,4,33,7]%%%}+%%%{-5637144576
*i,[0,0,10,4,33,6]%%%}+%%%{-905969664*i,[0,0,10,4,33,5]%%%}+%%%{2227175424*
i,[0,0,10,4,33,4]%%%}+%%%{226492416*i,[0,0,10,4,33,3]%%%}+%%%{-520093696*i,
[0,0,10,4,33,2]%%%}+%%%{-25165824*i,[0,0,10,4,33,1]%%%}+%%%{54525952*i,[0,0
,10,4,33,0]%%%}+%%%{8388608,[0,0,10,3,34,20]%%%}+%%%{-142606336,[0,0,10,3,3
4,19]%%%}+%%%{58720256,[0,0,10,3,34,18]%%%}+%%%{1283457024,[0,0,10,3,34,17]
%%%}+%%%{-905969664,[0,0,10,3,34,16]%%%}+%%%{-5133828096,[0,0,10,3,34,15]%%
%}+%%%{4127195136,[0,0,10,3,34,14]%%%}+%%%{11978932224,[0,0,10,3,34,13]%%%}
+%%%{-10217324544,[0,0,10,3,34,12]%%%}+%%%{-17968398336,[0,0,10,3,34,11]%%%
}+%%%{15854469120,[0,0,10,3,34,10]%%%}+%%%{17968398336,[0,0,10,3,34,9]%%%}+
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%%{10972299264,[0,0,10,3,34,6]%%%}+%%%{5133828096,[0,0,10,3,34,5]%%%}+%%%{-
4756340736,[0,0,10,3,34,4]%%%}+%%%{-1283457024,[0,0,10,3,34,3]%%%}+%%%{1199
570944,[0,0,10,3,34,2]%%%}+%%%{142606336,[0,0,10,3,34,1]%%%}+%%%{-134217728
,[0,0,10,3,34,0]%%%}+%%%{8388608*i,[0,0,10,2,35,20]%%%}+%%%{-25165824*i,[0,
0,10,2,35,19]%%%}+%%%{-58720256*i,[0,0,10,2,35,18]%%%}+%%%{226492416*i,[0,0
,10,2,35,17]%%%}+%%%{150994944*i,[0,0,10,2,35,16]%%%}+%%%{-905969664*i,[0,0

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,10,2,35,15]%%%}+%%%{-100663296*i,[0,0,10,2,35,14]%%%}+%%%{2113929216*i,[0,
0,10,2,35,13]%%%}+%%%{-352321536*i,[0,0,10,2,35,12]%%%}+%%%{-3170893824*i,[
0,0,10,2,35,11]%%%}+%%%{1056964608*i,[0,0,10,2,35,10]%%%}+%%%{3170893824*i,
[0,0,10,2,35,9]%%%}+%%%{-1409286144*i,[0,0,10,2,35,8]%%%}+%%%{-2113929216*i
,[0,0,10,2,35,7]%%%}+%%%{1107296256*i,[0,0,10,2,35,6]%%%}+%%%{905969664*i,[
0,0,10,2,35,5]%%%}+%%%{-528482304*i,[0,0,10,2,35,4]%%%}+%%%{-226492416*i,[0
,0,10,2,35,3]%%%}+%%%{142606336*i,[0,0,10,2,35,2]%%%}+%%%{25165824*i,[0,0,1
0,2,35,1]%%%}+%%%{-16777216*i,[0,0,10,2,35,0]%%%}+%%%{1048576,[0,0,10,1,36,
20]%%%}+%%%{-25165824,[0,0,10,1,36,19]%%%}+%%%{14680064,[0,0,10,1,36,18]%%%
}+%%%{226492416,[0,0,10,1,36,17]%%%}+%%%{-179306496,[0,0,10,1,36,16]%%%}+%%
%{-905969664,[0,0,10,1,36,15]%%%}+%%%{780140544,[0,0,10,1,36,14]%%%}+%%%{21
13929216,[0,0,10,1,36,13]%%%}+%%%{-1893728256,[0,0,10,1,36,12]%%%}+%%%{-317
0893824,[0,0,10,1,36,11]%%%}+%%%{2906652672,[0,0,10,1,36,10]%%%}+%%%{317089
3824,[0,0,10,1,36,9]%%%}+%%%{-2950692864,[0,0,10,1,36,8]%%%}+%%%{-211392921
6,[0,0,10,1,36,7]%%%}+%%%{1988100096,[0,0,10,1,36,6]%%%}+%%%{905969664,[0,0
,10,1,36,5]%%%}+%%%{-858783744,[0,0,10,1,36,4]%%%}+%%%{-226492416,[0,0,10,1
,36,3]%%%}+%%%{216006656,[0,0,10,1,36,2]%%%}+%%%{25165824,[0,0,10,1,36,1]%%
%}+%%%{-24117248,[0,0,10,1,36,0]%%%}+%%%{1048576*i,[0,0,10,0,37,20]%%%}+%%%
{-8388608*i,[0,0,10,0,37,19]%%%}+%%%{-2097152*i,[0,0,10,0,37,18]%%%}+%%%{75
497472*i,[0,0,10,0,37,17]%%%}+%%%{-28311552*i,[0,0,10,0,37,16]%%%}+%%%{-301
989888*i,[0,0,10,0,37,15]%%%}+%%%{176160768*i,[0,0,10,0,37,14]%%%}+%%%{7046
43072*i,[0,0,10,0,37,13]%%%}+%%%{-484442112*i,[0,0,10,0,37,12]%%%}+%%%{-105
6964608*i,[0,0,10,0,37,11]%%%}+%%%{792723456*i,[0,0,10,0,37,10]%%%}+%%%{105
6964608*i,[0,0,10,0,37,9]%%%}+%%%{-836763648*i,[0,0,10,0,37,8]%%%}+%%%{-704
643072*i,[0,0,10,0,37,7]%%%}+%%%{578813952*i,[0,0,10,0,37,6]%%%}+%%%{301989
888*i,[0,0,10,0,37,5]%%%}+%%%{-254803968*i,[0,0,10,0,37,4]%%%}+%%%{-7549747
2*i,[0,0,10,0,37,3]%%%}+%%%{65011712*i,[0,0,10,0,37,2]%%%}+%%%{8388608*i,[0
,0,10,0,37,1]%%%}+%%%{-7340032*i,[0,0,10,0,37,0]%%%} / %%%{1024,[0,0,5,9,10
,10]%%%}+%%%{-5120,[0,0,5,9,10,8]%%%}+%%%{10240,[0,0,5,9,10,6]%%%}+%%%{-102
40,[0,0,5,9,10,4]%%%}+%%%{5120,[0,0,5,9,10,2]%%%}+%%%{-1024,[0,0,5,9,10,0]%
%%}+%%%{1024*i,[0,0,5,8,11,10]%%%}+%%%{-5120*i,[0,0,5,8,11,8]%%%}+%%%{10240
*i,[0,0,5,8,11,6]%%%}+%%%{-10240*i,[0,0,5,8,11,4]%%%}+%%%{5120*i,[0,0,5,8,1
1,2]%%%}+%%%{-1024*i,[0,0,5,8,11,0]%%%}+%%%{4096,[0,0,5,7,12,10]%%%}+%%%{-2
0480,[0,0,5,7,12,8]%%%}+%%%{40960,[0,0,5,7,12,6]%%%}+%%%{-40960,[0,0,5,7,12
,4]%%%}+%%%{20480,[0,0,5,7,12,2]%%%}+%%%{-4096,[0,0,5,7,12,0]%%%}+%%%{4096*
i,[0,0,5,6,13,10]%%%}+%%%{-20480*i,[0,0,5,6,13,8]%%%}+%%%{40960*i,[0,0,5,6,
13,6]%%%}+%%%{-40960*i,[0,0,5,6,13,4]%%%}+%%%{20480*i,[0,0,5,6,13,2]%%%}+%%
%{-4096*i,[0,0,5,6,13,0]%%%}+%%%{6144,[0,0,5,5,14,10]%%%}+%%%{-30720,[0,0,5
,5,14,8]%%%}+%%%{61440,[0,0,5,5,14,6]%%%}+%%%{-61440,[0,0,5,5,14,4]%%%}+%%%
{30720,[0,0,5,5,14,2]%%%}+%%%{-6144,[0,0,5,5,14,0]%%%}+%%%{6144*i,[0,0,5,4,
15,10]%%%}+%%%{-30720*i,[0,0,5,4,15,8]%%%}+%%%{61440*i,[0,0,5,4,15,6]%%%}+%
%%{-61440*i,[0,0,5,4,15,4]%%%}+%%%{30720*i,[0,0,5,4,15,2]%%%}+%%%{-6144*i,[
0,0,5,4,15,0]%%%}+%%%{4096,[0,0,5,3,16,10]%%%}+%%%{-20480,[0,0,5,3,16,8]%%%
}+%%%{40960,[0,0,5,3,16,6]%%%}+%%%{-40960,[0,0,5,3,16,4]%%%}+%%%{20480,[0,0
,5,3,16,2]%%%}+%%%{-4096,[0,0,5,3,16,0]%%%}+%%%{4096*i,[0,0,5,2,17,10]%%%}+
%%%{-20480*i,[0,0,5,2,17,8]%%%}+%%%{40960*i,[0,0,5,2,17,6]%%%}+%%%{-40960*i
,[0,0,5,2,17,4]%%%}+%%%{20480*i,[0,0,5,2,17,2]%%%}+%%%{-4096*i,[0,0,5,2,17,
0]%%%}+%%%{1024,[0,0,5,1,18,10]%%%}+%%%{-5120,[0,0,5,1,18,8]%%%}+%%%{10240,
[0,0,5,1,18,6]%%%}+%%%{-10240,[0,0,5,1,18,4]%%%}+%%%{5120,[0,0,5,1,18,2]%%%
}+%%%{-1024,[0,0,5,1,18,0]%%%}+%%%{1024*i,[0,0,5,0,19,10]%%%}+%%%{-5120*i,[
0,0,5,0,19,8]%%%}+%%%{10240*i,[0,0,5,0,19,6]%%%}+%%%{-10240*i,[0,0,5,0,19,4
]%%%}+%%%{5120*i,[0,0,5,0,19,2]%%%}+%%%{-1024*i,[0,0,5,0,19,0]%%%} Error: B
ad Argument Value
```

maple [F] time = 1.28, size = 0, normalized size = 0.00

$$\int \left(\cos^4(dx+c)\right)(a+b\tan(dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^4*(a+b*tan(d*x+c))^n,x)
[Out] int(cos(d*x+c)^4*(a+b*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b \tan (dx + c) + a)^n \cos (dx + c)^4 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^4*(a+b*tan(d*x+c))^n,x, algorithm="maxima")
[Out] integrate((b*tan(d*x + c) + a)^n*cos(d*x + c)^4, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \cos (c + d\,x)^4\,(a + b\tan (c + d\,x))^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^4*(a + b*tan(c + d*x))^n,x)
[Out] int(cos(c + d*x)^4*(a + b*tan(c + d*x))^n, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**4*(a+b*tan(d*x+c))**n,x)
[Out] Timed out
```

3.651 $\int \sec^3(c+dx)(a+b\tan(c+dx))^n\,dx$

Optimal. Leaf size=159

$$\frac{\sec(c+dx)(a+b\tan(c+dx))^{n+1}F_1\left(n+1;-\frac{1}{2},-\frac{1}{2};n+2;\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}},\frac{a+b\tan(c+dx)}{a+\sqrt{-b^2}}\right)}{bd(n+1)\sqrt{1-\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}}}\sqrt{1-\frac{a+b\tan(c+dx)}{a+\sqrt{-b^2}}}}$$

```
[Out] AppellF1(1+n,-1/2,-1/2,2+n,(a+b*tan(d*x+c))/(a-(-b^2)^(1/2)),(a+b*tan(d*x+c
))/(a+(-b^2)^(1/2)))*sec(d*x+c)*(a+b*tan(d*x+c))^(1+n)/b/d/(1+n)/(1+(-a-b*t
an(d*x+c))/(a-(-b^2)^(1/2)))^(1/2)/(1+(-a-b*tan(d*x+c))/(a+(-b^2)^(1/2)))^(
1/2)
```

Rubi [A] time = 0.16, antiderivative size = 159, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {3512, 760, 133}

$$\frac{\sec(c+dx)(a+b\tan(c+dx))^{n+1}F_1\left(n+1;-\frac{1}{2},-\frac{1}{2};n+2;\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}},\frac{a+b\tan(c+dx)}{a+\sqrt{-b^2}}\right)}{bd(n+1)\sqrt{1-\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}}}\sqrt{1-\frac{a+b\tan(c+dx)}{a+\sqrt{-b^2}}}}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]^3*(a + b*Tan[c + d*x])^n,x]
```

```
[Out] (AppellF1[1 + n, -1/2, -1/2, 2 + n, (a + b*Tan[c + d*x])/(a - Sqrt[-b^2]),
(a + b*Tan[c + d*x])/(a + Sqrt[-b^2])]*Sec[c + d*x]*(a + b*Tan[c + d*x])^(1
 + n))/(b*d*(1 + n)*Sqrt[1 - (a + b*Tan[c + d*x])/(a - Sqrt[-b^2])]*Sqrt[1
- (a + b*Tan[c + d*x])/(a + Sqrt[-b^2])])
```

Rule 133

```
Int[((b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_)*((e_) + (f_.)*(x_))^(p_), x_
Symbol] :> Simp[(c^n*e^p*(b*x)^(m + 1)*AppellF1[m + 1, -n, -p, m + 2, -((d*
x)/c), -((f*x)/e)])/(b*(m + 1)), x] /; FreeQ[{b, c, d, e, f, m, n, p}, x] &
&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[c, 0] && (IntegerQ[p] || GtQ[e, 0])
```

Rule 760

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[(a + c*x^2)^p/(e*(1 - (d + e*x)/(d + (e*q)/c))^p*
(1 - (d + e*x)/(d - (e*q)/c))^p), Subst[Int[x^m*Simp[1 - x/(d + (e*q)/c), x
]^p*Simp[1 - x/(d - (e*q)/c), x]^p, x], x, d + e*x], x]] /; FreeQ[{a, c, d,
 e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IntegerQ[p]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \sec^3(c+dx)(a+b\tan(c+dx))^n\,dx = \frac{\sec(c+dx)\,\text{Subst}\left(\int (a+x)^n\sqrt{1+\frac{x^2}{b^2}}\,dx,x,b\tan(c+dx)\right)}{bd\sqrt{\sec^2(c+dx)}}$$

$$= \frac{\sec(c+dx)\,\text{Subst}\left(\int x^n\sqrt{1-\frac{x}{a-\sqrt{-b^2}}}\sqrt{1-\frac{x}{a+\sqrt{-b^2}}}\,dx,x,a+b\tan(c+d\right.}{bd\sqrt{1-\frac{a+b\tan(c+dx)}{a-\frac{b^2}{\sqrt{-b^2}}}}\sqrt{1-\frac{a+b\tan(c+dx)}{a+\frac{b^2}{\sqrt{-b^2}}}}}$$

$$= \frac{F_1\left(1+n;-\frac{1}{2},-\frac{1}{2};2+n;\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}},\frac{a+b\tan(c+dx)}{a+\sqrt{-b^2}}\right)\sec(c+dx)(a+b\tan(}{bd(1+n)\sqrt{1-\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}}}\sqrt{1-\frac{a+b\tan(c+dx)}{a+\sqrt{-b^2}}}}$$

Mathematica [C] time = 4.04, size = 306, normalized size = 1.92

$$\frac{2(n+2)(a-ib)(a+ib)\sec(c+dx)(a+b\tan(c+dx))^{n+1}}{bd(n+1)\left(2(n+2)\left(a^2+b^2\right)F_1\left(n+1;-\frac{1}{2},-\frac{1}{2};n+2;\frac{a+b\tan(c+dx)}{a-ib},\frac{a+b\tan(c+dx)}{a+ib}\right)-(a+b\tan(c+dx))\left((a-ib)F_1\left(\right.\right.\right.}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sec[c + d*x]^3*(a + b*Tan[c + d*x])^n,x]
```

```
[Out] (2*(a - I*b)*(a + I*b)*(2 + n)*AppellF1[1 + n, -1/2, -1/2, 2 + n, (a + b*Ta
n[c + d*x])/(a - I*b), (a + b*Tan[c + d*x])/(a + I*b)]*Sec[c + d*x]*(a + b*
Tan[c + d*x])^(1 + n))/(b*d*(1 + n)*(2*(a^2 + b^2)*(2 + n)*AppellF1[1 + n,
-1/2, -1/2, 2 + n, (a + b*Tan[c + d*x])/(a - I*b), (a + b*Tan[c + d*x])/(a
+ I*b)] - ((a - I*b)*AppellF1[2 + n, -1/2, 1/2, 3 + n, (a + b*Tan[c + d*x])
/(a - I*b), (a + b*Tan[c + d*x])/(a + I*b)] + (a + I*b)*AppellF1[2 + n, 1/2
, -1/2, 3 + n, (a + b*Tan[c + d*x])/(a - I*b), (a + b*Tan[c + d*x])/(a + I*
b)])*(a + b*Tan[c + d*x])))
```

fricas [F] time = 0.70, size = 0, normalized size = 0.00

$$\text{integral}\left((b\tan(dx+c)+a)^n\sec(dx+c)^3,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+b*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral((b*tan(d*x + c) + a)^n*sec(d*x + c)^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\tan(dx+c)+a)^n\sec(dx+c)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+b*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((b*tan(d*x + c) + a)^n*sec(d*x + c)^3, x)
```

maple [F] time = 0.66, size = 0, normalized size = 0.00

$$\int \left(\sec^3(dx+c)\right)(a+b\tan(dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)^3*(a+b*tan(d*x+c))^n,x)
```

```
[Out] int(sec(d*x+c)^3*(a+b*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b \tan (dx + c) + a)^n \sec (dx + c)^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)^3*(a+b*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] integrate((b*tan(d*x + c) + a)^n*sec(d*x + c)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a + b \tan (c + d\,x))^n}{\cos (c + d\,x)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))^n/cos(c + d*x)^3,x)
```

```
[Out] int((a + b*tan(c + d*x))^n/cos(c + d*x)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a + b \tan (c + dx))^n \sec^3 (c + dx) \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)**3*(a+b*tan(d*x+c))**n,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**n*sec(c + d*x)**3, x)
```

3.652 $\int \sec(c+dx)(a+b\tan(c+dx))^n\,dx$

Optimal. Leaf size=159

$$\frac{\cos(c+dx)\sqrt{1-\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}}}\sqrt{1-\frac{a+b\tan(c+dx)}{a+\sqrt{-b^2}}}\,(a+b\tan(c+dx))^{n+1}F_1\left(n+1;\frac{1}{2},\frac{1}{2};n+2;\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}},\frac{a+b\tan(c+d}{a+\sqrt{-b^2}}\right.}{bd(n+1)}$$

```
[Out] AppellF1(1+n,1/2,1/2,2+n,(a+b*tan(d*x+c))/(a-(-b^2)^(1/2)),(a+b*tan(d*x+c))
/(a+(-b^2)^(1/2)))*cos(d*x+c)*(1+(-a-b*tan(d*x+c))/(a-(-b^2)^(1/2)))^(1/2)*
(1+(-a-b*tan(d*x+c))/(a+(-b^2)^(1/2)))^(1/2)*(a+b*tan(d*x+c))^(1+n)/b/d/(1+
n)
```

Rubi [A] time = 0.11, antiderivative size = 159, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {3512, 760, 133}

$$\frac{\cos(c+dx)\sqrt{1-\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}}}\sqrt{1-\frac{a+b\tan(c+dx)}{a+\sqrt{-b^2}}}\,(a+b\tan(c+dx))^{n+1}F_1\left(n+1;\frac{1}{2},\frac{1}{2};n+2;\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}},\frac{a+b\tan(c+d}{a+\sqrt{-b^2}}\right.}{bd(n+1)}$$

Antiderivative was successfully verified.

```
[In] Int[Sec[c + d*x]*(a + b*Tan[c + d*x])^n,x]
```

```
[Out] (AppellF1[1 + n, 1/2, 1/2, 2 + n, (a + b*Tan[c + d*x])/(a - Sqrt[-b^2]), (a
 + b*Tan[c + d*x])/(a + Sqrt[-b^2])]*Cos[c + d*x]*(a + b*Tan[c + d*x])^(1 +
 n)*Sqrt[1 - (a + b*Tan[c + d*x])/(a - Sqrt[-b^2])]*Sqrt[1 - (a + b*Tan[c +
 d*x])/(a + Sqrt[-b^2])])/(b*d*(1 + n))
```

Rule 133

```
Int[((b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_)*((e_) + (f_.)*(x_))^(p_), x_
Symbol] :> Simp[(c^n*e^p*(b*x)^(m + 1)*AppellF1[m + 1, -n, -p, m + 2, -((d*
x)/c), -((f*x)/e)])/(b*(m + 1)), x] /; FreeQ[{b, c, d, e, f, m, n, p}, x] &
&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[c, 0] && (IntegerQ[p] || GtQ[e, 0])
```

Rule 760

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[(a + c*x^2)^p/(e*(1 - (d + e*x)/(d + (e*q)/c))^p*
(1 - (d + e*x)/(d - (e*q)/c))^p), Subst[Int[x^m*Simp[1 - x/(d + (e*q)/c), x
]^p*Simp[1 - x/(d - (e*q)/c), x]^p, x], x, d + e*x], x]] /; FreeQ[{a, c, d,
 e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IntegerQ[p]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \sec(c+dx)(a+b\tan(c+dx))^n\,dx = \frac{\sec(c+dx)\,\text{Subst}\left(\int \frac{(a+x)^n}{\sqrt{1+\frac{x^2}{b^2}}}dx, x, b\tan(c+dx)\right)}{bd\sqrt{\sec^2(c+dx)}}$$

$$= \frac{\left(\cos(c+dx)\sqrt{1-\frac{a+b\tan(c+dx)}{a-\frac{b^2}{\sqrt{-b^2}}}}\sqrt{1-\frac{a+b\tan(c+dx)}{a+\frac{b^2}{\sqrt{-b^2}}}}\right)\text{Subst}\left(\int \frac{x}{\sqrt{1-\frac{x}{a-\sqrt{-b^2}}}}\right.}{bd}$$

$$= \frac{F_1\left(1+n;\frac{1}{2},\frac{1}{2};2+n;\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}},\frac{a+b\tan(c+dx)}{a+\sqrt{-b^2}}\right)\cos(c+dx)(a+b\tan(c}{bd(1+n)}$$

Mathematica [C] time = 3.87, size = 340, normalized size = 2.14

$$\frac{2(n+2)\left(a^2+b^2\right)^2\cos^3(c+dx)(\tan(c+dx)-i)(\tan(c+dx)+}{bd(n+1)(a-ib)(a+ib)\left(2(n+2)\left(a^2+b^2\right)F_1\left(n+1;\frac{1}{2},\frac{1}{2};n+2;\frac{a+b\tan(c+dx)}{a-ib},\frac{a+b\tan(c+dx)}{a+ib}\right)+(a+b\tan(c+dx\right.}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sec[c + d*x]*(a + b*Tan[c + d*x])^n,x]
```

```
[Out] (2*(a^2 + b^2)^2*(2 + n)*AppellF1[1 + n, 1/2, 1/2, 2 + n, (a + b*Tan[c + d*
x])/(a - I*b), (a + b*Tan[c + d*x])/(a + I*b)]*Cos[c + d*x]^3*(-I + Tan[c +
 d*x])*(I + Tan[c + d*x])*(a + b*Tan[c + d*x])^(1 + n))/((a - I*b)*(a + I*b
)*b*d*(1 + n)*(2*(a^2 + b^2)*(2 + n)*AppellF1[1 + n, 1/2, 1/2, 2 + n, (a +
b*Tan[c + d*x])/(a - I*b), (a + b*Tan[c + d*x])/(a + I*b)] + ((a - I*b)*App
ellF1[2 + n, 1/2, 3/2, 3 + n, (a + b*Tan[c + d*x])/(a - I*b), (a + b*Tan[c
+ d*x])/(a + I*b)] + (a + I*b)*AppellF1[2 + n, 3/2, 1/2, 3 + n, (a + b*Tan[
c + d*x])/(a - I*b), (a + b*Tan[c + d*x])/(a + I*b)])*(a + b*Tan[c + d*x]))
)
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left((b\tan(dx+c)+a)^n\sec(dx+c), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+b*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral((b*tan(d*x + c) + a)^n*sec(d*x + c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\tan(dx+c)+a)^n\sec(dx+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+b*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((b*tan(d*x + c) + a)^n*sec(d*x + c), x)
```

maple [F] time = 0.93, size = 0, normalized size = 0.00

$$\int \sec(dx+c)\,(a+b\tan(dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(sec(d*x+c)*(a+b*tan(d*x+c))^n,x)
```

```
[Out] int(sec(d*x+c)*(a+b*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\tan(dx+c)+a)^n \sec(dx+c)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+b*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] integrate((b*tan(d*x + c) + a)^n*sec(d*x + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\tan(c+d\,x))^n}{\cos(c+d\,x)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*tan(c + d*x))^n/cos(c + d*x),x)
```

```
[Out] int((a + b*tan(c + d*x))^n/cos(c + d*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+b\tan(c+dx))^n \sec(c+dx)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(sec(d*x+c)*(a+b*tan(d*x+c))**n,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**n*sec(c + d*x), x)
```

3.653 $\int \cos(c+dx)(a+b\tan(c+dx))^n\,dx$

Optimal. Leaf size=161

$$\frac{\cos^3(c+dx)\left(1-\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}}\right)^{3/2}\left(1-\frac{a+b\tan(c+dx)}{a+\sqrt{-b^2}}\right)^{3/2}(a+b\tan(c+dx))^{n+1}F_1\left(n+1;\frac{3}{2},\frac{3}{2};n+2;\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}},\ldots\right.}{bd(n+1)}$$

```
[Out] AppellF1(1+n,3/2,3/2,2+n,(a+b*tan(d*x+c))/(a-(-b^2)^(1/2)),(a+b*tan(d*x+c))
/(a+(-b^2)^(1/2)))*cos(d*x+c)^3*(a+b*tan(d*x+c))^(1+n)*(1+(-a-b*tan(d*x+c))
/(a-(-b^2)^(1/2)))^(3/2)*(1+(-a-b*tan(d*x+c))/(a+(-b^2)^(1/2)))^(3/2)/b/d/(
1+n)
```

Rubi [A] time = 0.12, antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {3512, 760, 133}

$$\frac{\cos^3(c+dx)\left(1-\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}}\right)^{3/2}\left(1-\frac{a+b\tan(c+dx)}{a+\sqrt{-b^2}}\right)^{3/2}(a+b\tan(c+dx))^{n+1}F_1\left(n+1;\frac{3}{2},\frac{3}{2};n+2;\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}},\ldots\right.}{bd(n+1)}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]*(a + b*Tan[c + d*x])^n,x]
```

```
[Out] (AppellF1[1 + n, 3/2, 3/2, 2 + n, (a + b*Tan[c + d*x])/(a - Sqrt[-b^2]), (a
 + b*Tan[c + d*x])/(a + Sqrt[-b^2])]*Cos[c + d*x]^3*(a + b*Tan[c + d*x])^(1
 + n)*(1 - (a + b*Tan[c + d*x])/(a - Sqrt[-b^2]))^(3/2)*(1 - (a + b*Tan[c +
 d*x])/(a + Sqrt[-b^2]))^(3/2))/(b*d*(1 + n))
```

Rule 133

```
Int[((b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_)*((e_) + (f_.)*(x_))^(p_), x_
Symbol] :> Simp[(c^n*e^p*(b*x)^(m + 1)*AppellF1[m + 1, -n, -p, m + 2, -((d*
x)/c), -((f*x)/e)])/(b*(m + 1)), x] /; FreeQ[{b, c, d, e, f, m, n, p}, x] &
&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[c, 0] && (IntegerQ[p] || GtQ[e, 0])
```

Rule 760

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[(a + c*x^2)^p/(e*(1 - (d + e*x)/(d + (e*q)/c))^p*
(1 - (d + e*x)/(d - (e*q)/c))^p), Subst[Int[x^m*Simp[1 - x/(d + (e*q)/c), x
]^p*Simp[1 - x/(d - (e*q)/c), x]^p, x], x, d + e*x], x]] /; FreeQ[{a, c, d,
 e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IntegerQ[p]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \cos(c+dx)(a+b\tan(c+dx))^n\,dx = \frac{\left(\cos(c+dx)\sqrt{\sec^2(c+dx)}\right)\text{Subst}\left(\int \frac{(a+x)^n}{\left(1+\frac{x^2}{b^2}\right)^{3/2}}\,dx, x, b\tan(c+dx)\right)}{bd}$$
$$= \frac{\left(\cos^3(c+dx)\left(1-\frac{a+b\tan(c+dx)}{a-\frac{b^2}{\sqrt{-b^2}}}\right)^{3/2}\left(1-\frac{a+b\tan(c+dx)}{a+\frac{b^2}{\sqrt{-b^2}}}\right)^{3/2}\right)\text{Subst}\left(\int \frac{x}{\left(1-\frac{x}{a-\sqrt{-b}}\right.}\right.}{bd}$$
$$= \frac{F_1\left(1+n;\frac{3}{2},\frac{3}{2};2+n;\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}},\frac{a+b\tan(c+dx)}{a+\sqrt{-b^2}}\right)\cos^3(c+dx)(a+b\tan(c+}{bd(1+n)}$$

Mathematica [C] time = 4.95, size = 341, normalized size = 2.12

$$\frac{2(n+2)\left(a^2+b^2\right)^2\cos^5(c+dx)(\tan(c+dx)-i)(\tan(c+dx)+i)(}{bd(n+1)(a-ib)(a+ib)\left(2(n+2)\left(a^2+b^2\right)F_1\left(n+1;\frac{3}{2},\frac{3}{2};n+2;\frac{a+b\tan(c+dx)}{a-ib},\frac{a+b\tan(c+dx)}{a+ib}\right)+3(a+b\tan(c+dx))\right.}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Cos[c + d*x]*(a + b*Tan[c + d*x])^n,x]
```

```
[Out] (2*(a^2 + b^2)^2*(2 + n)*AppellF1[1 + n, 3/2, 3/2, 2 + n, (a + b*Tan[c + d*
x])/(a - I*b), (a + b*Tan[c + d*x])/(a + I*b)]*Cos[c + d*x]^5*(-I + Tan[c +
 d*x])*(I + Tan[c + d*x])*(a + b*Tan[c + d*x])^(1 + n))/((a - I*b)*(a + I*b
)*b*d*(1 + n)*(2*(a^2 + b^2)*(2 + n)*AppellF1[1 + n, 3/2, 3/2, 2 + n, (a +
b*Tan[c + d*x])/(a - I*b), (a + b*Tan[c + d*x])/(a + I*b)] + 3*((a - I*b)*A
ppellF1[2 + n, 3/2, 5/2, 3 + n, (a + b*Tan[c + d*x])/(a - I*b), (a + b*Tan[
c + d*x])/(a + I*b)] + (a + I*b)*AppellF1[2 + n, 5/2, 3/2, 3 + n, (a + b*Ta
n[c + d*x])/(a - I*b), (a + b*Tan[c + d*x])/(a + I*b)])*(a + b*Tan[c + d*x]
)))
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left((b\tan(dx+c)+a)^n\cos(dx+c), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+b*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral((b*tan(d*x + c) + a)^n*cos(d*x + c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\tan(dx+c)+a)^n\cos(dx+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+b*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((b*tan(d*x + c) + a)^n*cos(d*x + c), x)
```

maple [F] time = 0.54, size = 0, normalized size = 0.00

$$\int \cos(dx+c)(a+b\tan(dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)*(a+b*tan(d*x+c))^n,x)
```

```
[Out] int(cos(d*x+c)*(a+b*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\tan(dx+c)+a)^n\cos(dx+c)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+b*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] integrate((b*tan(d*x + c) + a)^n*cos(d*x + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \cos(c+d\,x)\,\left(a+b\tan(c+d\,x)\right)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)*(a + b*tan(c + d*x))^n,x)
```

```
[Out] int(cos(c + d*x)*(a + b*tan(c + d*x))^n, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+b\tan(c+dx))^n\cos(c+dx)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)*(a+b*tan(d*x+c))**n,x)
```

```
[Out] Integral((a + b*tan(c + d*x))**n*cos(c + d*x), x)
```

3.654 $\int \cos^3(c+dx)(a+b\tan(c+dx))^n\,dx$

Optimal. Leaf size=161

$$\frac{\cos^5(c+dx)\left(1-\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}}\right)^{5/2}\left(1-\frac{a+b\tan(c+dx)}{a+\sqrt{-b^2}}\right)^{5/2}(a+b\tan(c+dx))^{n+1}F_1\left(n+1;\frac{5}{2},\frac{5}{2};n+2;\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}},\frac{a+b\tan(c+dx)}{a+\sqrt{-b^2}}\right)}{bd(n+1)}$$

```
[Out] AppellF1(1+n,5/2,5/2,2+n,(a+b*tan(d*x+c))/(a-(-b^2)^(1/2)),(a+b*tan(d*x+c))
/(a+(-b^2)^(1/2)))*cos(d*x+c)^5*(a+b*tan(d*x+c))^(1+n)*(1+(-a-b*tan(d*x+c))
/(a-(-b^2)^(1/2)))^(5/2)*(1+(-a-b*tan(d*x+c))/(a+(-b^2)^(1/2)))^(5/2)/b/d/(
1+n)
```

Rubi [A] time = 0.13, antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {3512, 760, 133}

$$\frac{\cos^5(c+dx)\left(1-\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}}\right)^{5/2}\left(1-\frac{a+b\tan(c+dx)}{a+\sqrt{-b^2}}\right)^{5/2}(a+b\tan(c+dx))^{n+1}F_1\left(n+1;\frac{5}{2},\frac{5}{2};n+2;\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}},\frac{a+b\tan(c+dx)}{a+\sqrt{-b^2}}\right)}{bd(n+1)}$$

Antiderivative was successfully verified.

```
[In] Int[Cos[c + d*x]^3*(a + b*Tan[c + d*x])^n,x]
```

```
[Out] (AppellF1[1 + n, 5/2, 5/2, 2 + n, (a + b*Tan[c + d*x])/(a - Sqrt[-b^2]), (a
 + b*Tan[c + d*x])/(a + Sqrt[-b^2])]*Cos[c + d*x]^5*(a + b*Tan[c + d*x])^(1
 + n)*(1 - (a + b*Tan[c + d*x])/(a - Sqrt[-b^2]))^(5/2)*(1 - (a + b*Tan[c +
 d*x])/(a + Sqrt[-b^2]))^(5/2))/(b*d*(1 + n))
```

Rule 133

```
Int[((b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_)*((e_) + (f_.)*(x_))^(p_), x_
Symbol] :> Simp[(c^n*e^p*(b*x)^(m + 1)*AppellF1[m + 1, -n, -p, m + 2, -((d*
x)/c), -((f*x)/e)])/(b*(m + 1)), x] /; FreeQ[{b, c, d, e, f, m, n, p}, x] &
&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[c, 0] && (IntegerQ[p] || GtQ[e, 0])
```

Rule 760

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[(a + c*x^2)^p/(e*(1 - (d + e*x)/(d + (e*q)/c))^p*
(1 - (d + e*x)/(d - (e*q)/c))^p), Subst[Int[x^m*Simp[1 - x/(d + (e*q)/c), x
]^p*Simp[1 - x/(d - (e*q)/c), x]^p, x], x, d + e*x], x]] /; FreeQ[{a, c, d,
 e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IntegerQ[p]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rubi steps

$$\int \cos^3(c+dx)(a+b\tan(c+dx))^n\,dx = \frac{\left(\cos(c+dx)\sqrt{\sec^2(c+dx)}\right)\mathrm{Subst}\left(\int \frac{(a+x)^n}{\left(1+\frac{x^2}{b^2}\right)^{5/2}}dx, x, b\tan(c+dx)\right)}{bd}$$

$$= \frac{\left(\cos^5(c+dx)\left(1-\frac{a+b\tan(c+dx)}{a-\frac{b^2}{\sqrt{-b^2}}}\right)^{5/2}\left(1-\frac{a+b\tan(c+dx)}{a+\frac{b^2}{\sqrt{-b^2}}}\right)^{5/2}\right)\mathrm{Subst}\left(\int \frac{}{(1-}\right.}{bd}$$

$$= \frac{F_1\left(1+n;\frac{5}{2},\frac{5}{2};2+n;\frac{a+b\tan(c+dx)}{a-\sqrt{-b^2}},\frac{a+b\tan(c+dx)}{a+\sqrt{-b^2}}\right)\cos^5(c+dx)(a+b\tan}{bd(1+n)}$$

Mathematica [C] time = 6.38, size = 341, normalized size = 2.12

$$\frac{2(n+2)\left(a^2+b^2\right)^2\cos^7(c+dx)(\tan(c+dx)-i)(\tan(c+dx)+}{bd(n+1)(a-ib)(a+ib)\left(2(n+2)\left(a^2+b^2\right)F_1\left(n+1;\frac{5}{2},\frac{5}{2};n+2;\frac{a+b\tan(c+dx)}{a-ib},\frac{a+b\tan(c+dx)}{a+ib}\right)+5(a+b\tan(c+}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Cos[c + d*x]^3*(a + b*Tan[c + d*x])^n,x]
```

```
[Out] (2*(a^2 + b^2)^2*(2 + n)*AppellF1[1 + n, 5/2, 5/2, 2 + n, (a + b*Tan[c + d*
x])/(a - I*b), (a + b*Tan[c + d*x])/(a + I*b)]*Cos[c + d*x]^7*(-I + Tan[c +
 d*x])*(I + Tan[c + d*x])*(a + b*Tan[c + d*x])^(1 + n))/((a - I*b)*(a + I*b
)*b*d*(1 + n)*(2*(a^2 + b^2)*(2 + n)*AppellF1[1 + n, 5/2, 5/2, 2 + n, (a +
b*Tan[c + d*x])/(a - I*b), (a + b*Tan[c + d*x])/(a + I*b)] + 5*((a - I*b)*A
ppellF1[2 + n, 5/2, 7/2, 3 + n, (a + b*Tan[c + d*x])/(a - I*b), (a + b*Tan[
c + d*x])/(a + I*b)] + (a + I*b)*AppellF1[2 + n, 7/2, 5/2, 3 + n, (a + b*Ta
n[c + d*x])/(a - I*b), (a + b*Tan[c + d*x])/(a + I*b)])*(a + b*Tan[c + d*x]
)))
```

fricas [F] time = 0.54, size = 0, normalized size = 0.00

$$\mathrm{integral}\left((b\tan(dx+c)+a)^n\cos(dx+c)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+b*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral((b*tan(d*x + c) + a)^n*cos(d*x + c)^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\tan(dx+c)+a)^n\cos(dx+c)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+b*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((b*tan(d*x + c) + a)^n*cos(d*x + c)^3, x)
```

maple [F] time = 2.07, size = 0, normalized size = 0.00

$$\int \left(\cos^3(dx+c)\right)(a+b\tan(dx+c))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(d*x+c)^3*(a+b*tan(d*x+c))^n,x)
```

```
[Out] int(cos(d*x+c)^3*(a+b*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\tan(dx+c)+a)^n \cos(dx+c)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)^3*(a+b*tan(d*x+c))^n,x, algorithm="maxima")
```

```
[Out] integrate((b*tan(d*x + c) + a)^n*cos(d*x + c)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \cos(c+d\,x)^3\,(a+b\tan(c+d\,x))^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(cos(c + d*x)^3*(a + b*tan(c + d*x))^n,x)
```

```
[Out] int(cos(c + d*x)^3*(a + b*tan(c + d*x))^n, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(cos(d*x+c)**3*(a+b*tan(d*x+c))**n,x)
```

```
[Out] Timed out
```

3.655 $\int (e\cos(c+dx))^{7/2}(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=124

$$-\frac{2ia(e\cos(c+dx))^{7/2}}{7d}+\frac{10aF\left(\frac{1}{2}(c+dx)\middle|2\right)(e\cos(c+dx))^{7/2}}{21d\cos^{\frac{7}{2}}(c+dx)}+\frac{2a\tan(c+dx)(e\cos(c+dx))^{7/2}}{7d}+\frac{10a\tan(c+d}{}$$

```
[Out] -2/7*I*a*(e*cos(d*x+c))^(7/2)/d+10/21*a*(e*cos(d*x+c))^(7/2)*(cos(1/2*d*x+1
/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d/c
os(d*x+c)^(7/2)+2/7*a*(e*cos(d*x+c))^(7/2)*tan(d*x+c)/d+10/21*a*(e*cos(d*x+
c))^(7/2)*sec(d*x+c)^2*tan(d*x+c)/d
```

Rubi [A] time = 0.14, antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {3515, 3486, 3769, 3771, 2641}

$$-\frac{2ia(e\cos(c+dx))^{7/2}}{7d}+\frac{10aF\left(\frac{1}{2}(c+dx)\middle|2\right)(e\cos(c+dx))^{7/2}}{21d\cos^{\frac{7}{2}}(c+dx)}+\frac{2a\tan(c+dx)(e\cos(c+dx))^{7/2}}{7d}+\frac{10a\tan(c+d}{}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cos[c + d*x])^(7/2)*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (((-2*I)/7)*a*(e*Cos[c + d*x])^(7/2))/d + (10*a*(e*Cos[c + d*x])^(7/2)*Elli
pticF[(c + d*x)/2, 2])/(21*d*Cos[c + d*x]^(7/2)) + (2*a*(e*Cos[c + d*x])^(7
/2)*Tan[c + d*x])/(7*d) + (10*a*(e*Cos[c + d*x])^(7/2)*Sec[c + d*x]^2*Tan[c
 + d*x])/(21*d)
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
```

```
EqQ[n^2, 1/4]
```

Rubi steps

$$\int (e\cos(c+dx))^{7/2}(a+ia\tan(c+dx))\,dx = \left((e\cos(c+dx))^{7/2}(e\sec(c+dx))^{7/2}\right)\int \frac{a+ia\tan(c+dx)}{(e\sec(c+dx))^{7/2}}\,dx$$
$$= -\frac{2ia(e\cos(c+dx))^{7/2}}{7d} + \left(a(e\cos(c+dx))^{7/2}(e\sec(c+dx))^{7/2}\right)\int \frac{}{(e\,s}$$
$$= -\frac{2ia(e\cos(c+dx))^{7/2}}{7d} + \frac{2a(e\cos(c+dx))^{7/2}\tan(c+dx)}{7d} + \frac{(5a(e\cos}{}$$
$$= -\frac{2ia(e\cos(c+dx))^{7/2}}{7d} + \frac{2a(e\cos(c+dx))^{7/2}\tan(c+dx)}{7d} + \frac{10a(e\cos}{}$$
$$= -\frac{2ia(e\cos(c+dx))^{7/2}}{7d} + \frac{2a(e\cos(c+dx))^{7/2}\tan(c+dx)}{7d} + \frac{10a(e\cos}{}$$
$$= -\frac{2ia(e\cos(c+dx))^{7/2}}{7d} + \frac{10a(e\cos(c+dx))^{7/2}F\left(\frac{1}{2}(c+dx)\middle|2\right)}{21d\cos^{\frac{7}{2}}(c+dx)} + \frac{2a(}{}$$

Mathematica [A] time = 0.68, size = 133, normalized size = 1.07

$$\frac{ae^3(\cos(dx)-i\sin(dx))\sqrt{e\cos(c+dx)}\,(\cos(c+2dx)+i\sin(c+2dx))\left(\sqrt{\cos(c+dx)}\,(5\sin(2(c+dx))+2i\cos(2(\right.}{21d\sqrt{\cos(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cos[c + d*x])^(7/2)*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (a*e^3*Sqrt[e*Cos[c + d*x]]*(Cos[d*x] - I*Sin[d*x])*(10*EllipticF[(c + d*x)
/2, 2]*(Cos[c + d*x] - I*Sin[c + d*x]) + Sqrt[Cos[c + d*x]]*(-8*I + (2*I)*C
os[2*(c + d*x)] + 5*Sin[2*(c + d*x)]))*(Cos[c + 2*d*x] + I*Sin[c + 2*d*x]))
/(21*d*Sqrt[Cos[c + d*x]])
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\frac{\left(\sqrt{\frac{1}{2}}\left(-3i\,ae^3e^{(4i\,dx+4i\,c)} - 16i\,ae^3e^{(2i\,dx+2i\,c)} + 7i\,ae^3\right)\sqrt{ee^{(2i\,dx+2i\,c)}+e}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)} + 42\,de^{(i\,dx+i\,c)}\text{integral}\left(-\frac{10i\sqrt{\frac{1}{2}}\sqrt{}}{}\right.\right.}{42\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(7/2)*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/42*(sqrt(1/2)*(-3*I*a*e^3*e^(4*I*d*x + 4*I*c) - 16*I*a*e^3*e^(2*I*d*x + 2
*I*c) + 7*I*a*e^3)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*e^(-1/2*I*d*x - 1/2*I*c)
 + 42*d*e^(I*d*x + I*c)*integral(-10/21*I*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I
*c) + e)*a*e^3*e^(-1/2*I*d*x - 1/2*I*c)/(d*e^(2*I*d*x + 2*I*c) + d), x))*e^
(-I*d*x - I*c)/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\cos(dx+c))^{\frac{7}{2}}\,(i\,a\tan(dx+c)+a)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(7/2)*(a+I*a*tan(d*x+c)),x, algorithm="giac")
[Out] integrate((e*cos(d*x + c))^(7/2)*(I*a*tan(d*x + c) + a), x)
```

maple [A] time = 5.63, size = 241, normalized size = 1.94

$$-\frac{2a\,e^{4}\left(48i\left(\sin^{9}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+48\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^{8}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-96i\left(\sin^{7}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-72\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^{6}\left(\frac{dx}{2}\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^(7/2)*(a+I*a*tan(d*x+c)),x)
[Out] -2/21/sin(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1/2*c)^2*e+e)^(1/2)*a*e^4*(48*I*si
n(1/2*d*x+1/2*c)^9+48*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8-96*I*sin(1/2*
d*x+1/2*c)^7-72*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6+72*I*sin(1/2*d*x+1/
2*c)^5+56*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-24*I*sin(1/2*d*x+1/2*c)^3
+5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(
cos(1/2*d*x+1/2*c),2^(1/2))-16*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+3*I*
sin(1/2*d*x+1/2*c))/d
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\cos(dx+c))^{\frac{7}{2}}\,(i\,a\tan(dx+c)+a)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(7/2)*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
[Out] integrate((e*cos(d*x + c))^(7/2)*(I*a*tan(d*x + c) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int (e\,\cos(c+d\,x))^{7/2}\,(a+a\tan(c+d\,x)\,1\mathrm{i})\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^(7/2)*(a + a*tan(c + d*x)*1i),x)
[Out] int((e*cos(c + d*x))^(7/2)*(a + a*tan(c + d*x)*1i), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**(7/2)*(a+I*a*tan(d*x+c)),x)
[Out] Timed out
```

3.656 $\int (e\cos(c+dx))^{5/2}(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=90

$$-\frac{2ia(e\cos(c+dx))^{5/2}}{5d}+\frac{6aE\left(\frac{1}{2}(c+dx)\middle|2\right)(e\cos(c+dx))^{5/2}}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{2a\tan(c+dx)(e\cos(c+dx))^{5/2}}{5d}$$

```
[Out] -2/5*I*a*(e*cos(d*x+c))^(5/2)/d+6/5*a*(e*cos(d*x+c))^(5/2)*(cos(1/2*d*x+1/2
*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/d/cos
(d*x+c)^(5/2)+2/5*a*(e*cos(d*x+c))^(5/2)*tan(d*x+c)/d
```

Rubi [A] time = 0.11, antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {3515, 3486, 3769, 3771, 2639}

$$-\frac{2ia(e\cos(c+dx))^{5/2}}{5d}+\frac{6aE\left(\frac{1}{2}(c+dx)\middle|2\right)(e\cos(c+dx))^{5/2}}{5d\cos^{\frac{5}{2}}(c+dx)}+\frac{2a\tan(c+dx)(e\cos(c+dx))^{5/2}}{5d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cos[c + d*x])^(5/2)*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (((-2*I)/5)*a*(e*Cos[c + d*x])^(5/2))/d + (6*a*(e*Cos[c + d*x])^(5/2)*Ellip
ticE[(c + d*x)/2, 2])/(5*d*Cos[c + d*x]^(5/2)) + (2*a*(e*Cos[c + d*x])^(5/2
)*Tan[c + d*x])/(5*d)
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] && !IntegerQ[m]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int (e\cos(c+dx))^{5/2}(a+ia\tan(c+dx))\,dx = \left((e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}\right)\int \frac{a+ia\tan(c+dx)}{(e\sec(c+dx))^{5/2}}\,dx$$

$$= -\frac{2ia(e\cos(c+dx))^{5/2}}{5d} + \left(a(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}\right)\int$$

$$= -\frac{2ia(e\cos(c+dx))^{5/2}}{5d} + \frac{2a(e\cos(c+dx))^{5/2}\tan(c+dx)}{5d} + \frac{(3a(e}{}$$

$$= -\frac{2ia(e\cos(c+dx))^{5/2}}{5d} + \frac{2a(e\cos(c+dx))^{5/2}\tan(c+dx)}{5d} + \frac{(3a(e}{}$$

$$= -\frac{2ia(e\cos(c+dx))^{5/2}}{5d} + \frac{6a(e\cos(c+dx))^{5/2}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d\cos^{\frac{5}{2}}(c+dx)} + \frac{2}{}$$

Mathematica [C] time = 12.37, size = 387, normalized size = 4.30

$$\frac{(\cos(dx)-i\sin(dx))(a+ia\tan(c+dx))(e\cos(c+dx))^{5/2}\left(\frac{2\sqrt{2}(\cot(c)-i)e^{-idx}\left(e^{2idx}\sqrt{1+e^{2i(c+dx)}}\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)+3e^{2i(c+}\right.}{}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cos[c + d*x])^(5/2)*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((e*Cos[c + d*x])^(5/2)*(Cos[d*x] - I*Sin[d*x])*((2*Sqrt[2]*(-I + Cot[c])*(
3 + 3*E^((2*I)*(c + d*x)) + 3*Sqrt[1 - I*E^(I*(c + d*x))]*Sqrt[E^(I*(c + d*
x))*(-I + E^(I*(c + d*x)))]*EllipticE[ArcSin[Sqrt[(-I)*Cos[c + d*x] + Sin[c
 + d*x]]], -1] - 3*Sqrt[1 - I*E^(I*(c + d*x))]*Sqrt[E^(I*(c + d*x))*(-I + E
^(I*(c + d*x)))]*EllipticF[ArcSin[Sqrt[(-I)*Cos[c + d*x] + Sin[c + d*x]]],
-1] + E^((2*I)*d*x)*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/2, 3/
4, 7/4, -E^((2*I)*(c + d*x))]))/(5*E^(I*d*x)*Sqrt[(1 + E^((2*I)*(c + d*x)))
/E^(I*(c + d*x))]) + (2*Sqrt[Cos[c + d*x]]*Sin[c]*(-1 + Cos[2*d*x]*(1 - I*C
ot[c]) - 6*Cot[c]^2 + I*Sin[2*d*x] + Cot[c]*(5*I + Sin[2*d*x])))/5)*(a + I*
a*Tan[c + d*x]))/(2*d*Cos[c + d*x]^(3/2))
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\frac{\sqrt{\frac{1}{2}}\left(-iae^2e^{(3idx+3ic)}+iae^2e^{(2idx+2ic)}-7iae^2e^{(idx+ic)}-5iae^2\right)\sqrt{ee^{(2idx+2ic)}+e}\,e^{\left(-\frac{1}{2}idx-\frac{1}{2}ic\right)}+5\left(de^{(idx+ic)}-d\right)\mathrm{i}}{5\left(de^{(idx+ic)}-d\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(5/2)*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/5*(sqrt(1/2)*(-I*a*e^2*e^(3*I*d*x + 3*I*c) + I*a*e^2*e^(2*I*d*x + 2*I*c)
- 7*I*a*e^2*e^(I*d*x + I*c) - 5*I*a*e^2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*e^
(-1/2*I*d*x - 1/2*I*c) + 5*(d*e^(I*d*x + I*c) - d)*integral(1/5*sqrt(1/2)*(
-6*I*a*e^2*e^(2*I*d*x + 2*I*c) - 12*I*a*e^2*e^(I*d*x + I*c) - 6*I*a*e^2)*sq
rt(e*e^(2*I*d*x + 2*I*c) + e)*e^(-1/2*I*d*x - 1/2*I*c)/(d*e^(4*I*d*x + 4*I*
c) - 2*d*e^(3*I*d*x + 3*I*c) + 2*d*e^(2*I*d*x + 2*I*c) - 2*d*e^(I*d*x + I*c
) + d), x))/(d*e^(I*d*x + I*c) - d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\cos(dx+c))^{\frac{5}{2}}(i\,a\tan(dx+c)+a)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(5/2)*(a+I*a*tan(d*x+c)),x, algorithm="giac")
[Out] integrate((e*cos(d*x + c))^(5/2)*(I*a*tan(d*x + c) + a), x)
```

maple [B] time = 5.93, size = 205, normalized size = 2.28

$$\frac{2a\,e^3\left(8i\left(\sin^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+8\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-12i\left(\sin^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-8\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\cdots\right.}{5\sin\left(\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^(5/2)*(a+I*a*tan(d*x+c)),x)
[Out] 2/5/sin(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1/2*c)^2*e+e)^(1/2)*a*e^3*(8*I*sin(1
/2*d*x+1/2*c)^7+8*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6-12*I*sin(1/2*d*x+
1/2*c)^5-8*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+6*I*sin(1/2*d*x+1/2*c)^3
+3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(
cos(1/2*d*x+1/2*c),2^(1/2))+2*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-I*sin
(1/2*d*x+1/2*c))/d
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\cos(dx+c))^{\frac{5}{2}}(i\,a\tan(dx+c)+a)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(5/2)*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
[Out] integrate((e*cos(d*x + c))^(5/2)*(I*a*tan(d*x + c) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int (e\,\cos(c+d\,x))^{5/2}\,\left(a+a\tan(c+d\,x)\,1{}\mathrm{i}\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^(5/2)*(a + a*tan(c + d*x)*1i),x)
[Out] int((e*cos(c + d*x))^(5/2)*(a + a*tan(c + d*x)*1i), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**(5/2)*(a+I*a*tan(d*x+c)),x)
[Out] Timed out
```

3.657 $\int (e\cos(c+dx))^{3/2}(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=90

$$-\frac{2ia(e\cos(c+dx))^{3/2}}{3d}+\frac{2aF\left(\frac{1}{2}(c+dx)\middle|2\right)(e\cos(c+dx))^{3/2}}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{2a\tan(c+dx)(e\cos(c+dx))^{3/2}}{3d}$$

```
[Out] -2/3*I*a*(e*cos(d*x+c))^(3/2)/d+2/3*a*(e*cos(d*x+c))^(3/2)*(cos(1/2*d*x+1/2
*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d/cos
(d*x+c)^(3/2)+2/3*a*(e*cos(d*x+c))^(3/2)*tan(d*x+c)/d
```

Rubi [A] time = 0.11, antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {3515, 3486, 3769, 3771, 2641}

$$-\frac{2ia(e\cos(c+dx))^{3/2}}{3d}+\frac{2aF\left(\frac{1}{2}(c+dx)\middle|2\right)(e\cos(c+dx))^{3/2}}{3d\cos^{\frac{3}{2}}(c+dx)}+\frac{2a\tan(c+dx)(e\cos(c+dx))^{3/2}}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cos[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (((-2*I)/3)*a*(e*Cos[c + d*x])^(3/2))/d + (2*a*(e*Cos[c + d*x])^(3/2)*Ellip
ticF[(c + d*x)/2, 2])/(3*d*Cos[c + d*x]^(3/2)) + (2*a*(e*Cos[c + d*x])^(3/2
)*Tan[c + d*x])/(3*d)
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int (e\cos(c+dx))^{3/2}(a+ia\tan(c+dx))\,dx = \left((e\cos(c+dx))^{3/2}(e\sec(c+dx))^{3/2}\right)\int \frac{a+ia\tan(c+dx)}{(e\sec(c+dx))^{3/2}}\,dx$$

$$= -\frac{2ia(e\cos(c+dx))^{3/2}}{3d} + \left(a(e\cos(c+dx))^{3/2}(e\sec(c+dx))^{3/2}\right)\int \frac{}{(e\,s}$$

$$= -\frac{2ia(e\cos(c+dx))^{3/2}}{3d} + \frac{2a(e\cos(c+dx))^{3/2}\tan(c+dx)}{3d} + \frac{\left(a(e\cos\right.}{}$$

$$= -\frac{2ia(e\cos(c+dx))^{3/2}}{3d} + \frac{2a(e\cos(c+dx))^{3/2}\tan(c+dx)}{3d} + \frac{\left(a(e\cos\right.}{}$$

$$= -\frac{2ia(e\cos(c+dx))^{3/2}}{3d} + \frac{2a(e\cos(c+dx))^{3/2}F\left(\frac{1}{2}(c+dx)\middle|2\right)}{3d\cos^{\frac{3}{2}}(c+dx)} + \frac{2a(e}{}$$

Mathematica [A] time = 0.36, size = 100, normalized size = 1.11

$$\frac{2ae\sqrt{\cos(c+dx)}(\tan(c+dx)-i)(\cos(dx)-i\sin(dx))\sqrt{e\cos(c+dx)}\left(\sqrt{\cos(c+dx)}(\cos(dx)+i\sin(dx))+(\sin(\right.}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cos[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (2*a*e*Sqrt[Cos[c + d*x]]*Sqrt[e*Cos[c + d*x]]*(EllipticF[(c + d*x)/2, 2]*(
I*Cos[c] + Sin[c]) + Sqrt[Cos[c + d*x]]*(Cos[d*x] + I*Sin[d*x]))*(Cos[d*x]
- I*Sin[d*x])*(-I + Tan[c + d*x]))/(3*d)
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\frac{-2i\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\,aee^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)} + 3\,d\text{integral}\left(-\frac{2i\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\,aee^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{3\left(de^{(2i\,dx+2i\,c)}+d\right)},x\right)}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(3/2)*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] 1/3*(-2*I*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*a*e*e^(1/2*I*d*x + 1/2*
I*c) + 3*d*integral(-2/3*I*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*a*e*e^
(-1/2*I*d*x - 1/2*I*c)/(d*e^(2*I*d*x + 2*I*c) + d), x))/d
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(3/2)*(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 5.77, size = 168, normalized size = 1.87

$$-\frac{2a\,e^2\left(4i\left(\sin^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+4\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-4i\left(\sin^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\right.\right.}\right.}{3\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right.\right.}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^(3/2)*(a+I*a*tan(d*x+c)),x)
```

```
[Out] -2/3/sin(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1/2*c)^2*e+e)^(1/2)*a*e^2*(4*I*sin(
1/2*d*x+1/2*c)^5+4*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-4*I*sin(1/2*d*x+
1/2*c)^3+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Elli
pticF(cos(1/2*d*x+1/2*c),2^(1/2))-2*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)
+I*sin(1/2*d*x+1/2*c))/d
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\cos(dx+c))^{\frac{3}{2}}\,(i\,a\tan(dx+c)+a)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(3/2)*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] integrate((e*cos(d*x + c))^(3/2)*(I*a*tan(d*x + c) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int (e\,\cos(c+d\,x))^{3/2}\,\left(a+a\tan(c+d\,x)\,1\mathrm{i}\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i),x)
```

```
[Out] int((e*cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**(3/2)*(a+I*a*tan(d*x+c)),x)
```

```
[Out] Timed out
```

3.658 $\int \sqrt{e\cos(c+dx)}\,(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=60

$$\frac{2aE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}-\frac{2ia\sqrt{e\cos(c+dx)}}{d}$$

```
[Out] -2*I*a*(e*cos(d*x+c))^(1/2)/d+2*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+
1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))*(e*cos(d*x+c))^(1/2)/d/cos(d*x
+c)^(1/2)
```

Rubi [A] time = 0.08, antiderivative size = 60, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3515, 3486, 3771, 2639}

$$\frac{2aE\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\cos(c+dx)}}{d\sqrt{\cos(c+dx)}}-\frac{2ia\sqrt{e\cos(c+dx)}}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Cos[c + d*x]]*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((-2*I)*a*Sqrt[e*Cos[c + d*x]])/d + (2*a*Sqrt[e*Cos[c + d*x]]*EllipticE[(c
+ d*x)/2, 2])/(d*Sqrt[Cos[c + d*x]])
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \sqrt{e\cos(c+dx)}\,(a+ia\tan(c+dx))\,dx = \left(\sqrt{e\cos(c+dx)}\,\sqrt{e\sec(c+dx)}\right)\int \frac{a+ia\tan(c+dx)}{\sqrt{e\sec(c+dx)}}\,dx$$
$$= -\frac{2ia\sqrt{e\cos(c+dx)}}{d} + \left(a\sqrt{e\cos(c+dx)}\,\sqrt{e\sec(c+dx)}\right)\int \frac{}{\sqrt{e\sec}}$$
$$= -\frac{2ia\sqrt{e\cos(c+dx)}}{d} + \frac{\left(a\sqrt{e\cos(c+dx)}\right)\int\sqrt{\cos(c+dx)}\,dx}{\sqrt{\cos(c+dx)}}$$
$$= -\frac{2ia\sqrt{e\cos(c+dx)}}{d} + \frac{2a\sqrt{e\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{\cos(c+dx)}}$$

Mathematica [C] time = 0.71, size = 244, normalized size = 4.07

$$\frac{ae(\cot(c)+i)e^{-i(c+dx)}\left(e^{2idx}\sqrt{1+e^{2i(c+dx)}}\;{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)-3\sqrt{1-ie^{i(c+dx)}}\sqrt{e^{i(c+dx)}\left(e^{i(c+dx)}-i\right)}F\left(\sin^{-1}\right.\right.}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Cos[c + d*x]]*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (a*e*(I + Cot[c])*(3*Sqrt[1 - I*E^(I*(c + d*x))]*Sqrt[E^(I*(c + d*x))*(-I +
 E^(I*(c + d*x)))]*EllipticE[ArcSin[Sqrt[(-I)*Cos[c + d*x] + Sin[c + d*x]]]
, -1] - 3*Sqrt[1 - I*E^(I*(c + d*x))]*Sqrt[E^(I*(c + d*x))*(-I + E^(I*(c +
d*x)))]*EllipticF[ArcSin[Sqrt[(-I)*Cos[c + d*x] + Sin[c + d*x]]], -1] + E^(
(2*I)*d*x)*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/2, 3/4, 7/4, -
E^((2*I)*(c + d*x))]))/(3*d*E^(I*(c + d*x))*Sqrt[e*Cos[c + d*x]])
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\frac{-4i\sqrt{\frac{1}{2}}\sqrt{ee^{(2idx+2ic)}+e}\,ae^{\left(\frac{1}{2}idx+\frac{1}{2}ic\right)}+\left(de^{(idx+ic)}-d\right)\mathrm{integral}\left(\frac{\sqrt{\frac{1}{2}}\left(-2iae^{(2idx+2ic)}-4iae^{(idx+ic)}-2ia\right)\sqrt{ee^{(2idx+2ic)}+e}\,e^{\left(-\frac{1}{2}i\right.}}{de^{(4idx+4ic)}-2de^{(3idx+3ic)}+2de^{(2idx+2ic)}-2de^{(idx+ic)}+}\right.}{de^{(idx+ic)}-d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(1/2)*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] (-4*I*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*a*e^(1/2*I*d*x + 1/2*I*c) +
 (d*e^(I*d*x + I*c) - d)*integral(sqrt(1/2)*(-2*I*a*e^(2*I*d*x + 2*I*c) - 4
*I*a*e^(I*d*x + I*c) - 2*I*a)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*e^(-1/2*I*d*x
 - 1/2*I*c)/(d*e^(4*I*d*x + 4*I*c) - 2*d*e^(3*I*d*x + 3*I*c) + 2*d*e^(2*I*d
*x + 2*I*c) - 2*d*e^(I*d*x + I*c) + d), x))/(d*e^(I*d*x + I*c) - d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{e\cos(dx+c)}\,(ia\tan(dx+c)+a)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(1/2)*(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*cos(d*x + c))*(I*a*tan(d*x + c) + a), x)
```

maple [A] time = 3.52, size = 108, normalized size = 1.80

$$\frac{2ae\left(2i\left(\sin^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\;\mathrm{EllipticE}\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)-i\sin\left(\frac{dx}{2}+\frac{c}{2}\right.\right.}{\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)e+e}\;d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^(1/2)*(a+I*a*tan(d*x+c)),x)
```

```
[Out] 2/sin(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1/2*c)^2*e+e)^(1/2)*a*e*(2*I*sin(1/2*d
*x+1/2*c)^3+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*E
llipticE(cos(1/2*d*x+1/2*c),2^(1/2))-I*sin(1/2*d*x+1/2*c))/d
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{e\cos(dx+c)}\,(i\,a\tan(dx+c)+a)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(1/2)*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(e*cos(d*x + c))*(I*a*tan(d*x + c) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \sqrt{e\,\cos(c+d\,x)}\,\left(a+a\tan(c+d\,x)\,1\mathrm{i}\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i),x)
```

```
[Out] int((e*cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$ia\left(\int\left(-i\sqrt{e\cos(c+dx)}\right)dx+\int\sqrt{e\cos(c+dx)}\,\tan(c+dx)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**(1/2)*(a+I*a*tan(d*x+c)),x)
```

```
[Out] I*a*(Integral(-I*sqrt(e*cos(c + d*x)), x) + Integral(sqrt(e*cos(c + d*x))*t
an(c + d*x), x))
```

3.659 $\int \frac{a+ia\tan(c+dx)}{\sqrt{e\cos(c+dx)}}\,dx$

Optimal. Leaf size=60

$$\frac{2a\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{e\cos(c+dx)}}+\frac{2ia}{d\sqrt{e\cos(c+dx)}}$$

```
[Out] 2*I*a/d/(e*cos(d*x+c))^(1/2)+2*a*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1
/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))*cos(d*x+c)^(1/2)/d/(e*cos(d*x+c
))^(1/2)
```

Rubi [A] time = 0.08, antiderivative size = 60, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.154, Rules used = {3515, 3486, 3771, 2641}

$$\frac{2a\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{e\cos(c+dx)}}+\frac{2ia}{d\sqrt{e\cos(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])/Sqrt[e*Cos[c + d*x]],x]
```

```
[Out] ((2*I)*a)/(d*Sqrt[e*Cos[c + d*x]]) + (2*a*Sqrt[Cos[c + d*x]]*EllipticF[(c +
 d*x)/2, 2])/(d*Sqrt[e*Cos[c + d*x]])
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\begin{aligned}\int \frac{a+ia\tan(c+dx)}{\sqrt{e\cos(c+dx)}}\,dx &= \frac{\int \sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))\,dx}{\sqrt{e\cos(c+dx)}\sqrt{e\sec(c+dx)}}\\ &= \frac{2ia}{d\sqrt{e\cos(c+dx)}}+\frac{a\int \sqrt{e\sec(c+dx)}\,dx}{\sqrt{e\cos(c+dx)}\sqrt{e\sec(c+dx)}}\\ &= \frac{2ia}{d\sqrt{e\cos(c+dx)}}+\frac{\left(a\sqrt{\cos(c+dx)}\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{\sqrt{e\cos(c+dx)}}\\ &= \frac{2ia}{d\sqrt{e\cos(c+dx)}}+\frac{2a\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)}{d\sqrt{e\cos(c+dx)}}\end{aligned}$$

Mathematica [C] time = 1.03, size = 143, normalized size = 2.38

$$-\frac{\sqrt{2}\,a\sin(c)(\cot(c)-i)(\tan(c+dx)-i)(\cos(dx)-i\sin(dx))\sqrt{e\cos(c+dx)}\left(\sqrt{2}\sqrt{\csc^2(c)}+i\csc(c)\cos(c+dx)\sqrt{\ldots}\right.}{de\sqrt{\csc^2(c)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + I*a*Tan[c + d*x])/Sqrt[e*Cos[c + d*x]],x]
```

```
[Out] -((Sqrt[2]*a*Sqrt[e*Cos[c + d*x]]*(-I + Cot[c])*(Sqrt[2]*Sqrt[Csc[c]^2] + I
*Cos[c + d*x]*Sqrt[1 + Cos[2*d*x - 2*ArcTan[Cot[c]]]]*Csc[c]*Hypergeometric
PFQ[{1/4, 1/2}, {5/4}, Sin[d*x - ArcTan[Cot[c]]]^2]*Sec[d*x - ArcTan[Cot[c]
]])*Sin[c]*(Cos[d*x] - I*Sin[d*x])*(-I + Tan[c + d*x]))/(d*e*Sqrt[Csc[c]^2]
))
```

fricas [F] time = 0.51, size = 0, normalized size = 0.00

$$\frac{4i\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\,ae^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}+\left(dee^{(2i\,dx+2i\,c)}+de\right)\text{integral}\left(-\frac{2i\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\,ae^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{dee^{(2i\,dx+2i\,c)}+de},x\right)}{dee^{(2i\,dx+2i\,c)}+de}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))/(e*cos(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] (4*I*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*a*e^(1/2*I*d*x + 1/2*I*c) +
(d*e*e^(2*I*d*x + 2*I*c) + d*e)*integral(-2*I*sqrt(1/2)*sqrt(e*e^(2*I*d*x +
 2*I*c) + e)*a*e^(-1/2*I*d*x - 1/2*I*c)/(d*e*e^(2*I*d*x + 2*I*c) + d*e), x)
)/(d*e*e^(2*I*d*x + 2*I*c) + d*e)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{i\,a\tan(dx+c)+a}{\sqrt{e\cos(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))/(e*cos(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)/sqrt(e*cos(d*x + c)), x)
```

maple [A] time = 5.99, size = 94, normalized size = 1.57

$$\frac{2\left(-\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\;\text{EllipticF}\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)+i\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\right)a}{\sqrt{-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)e+e}\;\sin\left(\frac{dx}{2}+\frac{c}{2}\right)d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))/(e*cos(d*x+c))^(1/2),x)
```

```
[Out] 2/(-2*sin(1/2*d*x+1/2*c)^2*e+e)^(1/2)/sin(1/2*d*x+1/2*c)*(-(sin(1/2*d*x+1/2
*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),
2^(1/2))+I*sin(1/2*d*x+1/2*c))*a/d
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{i\,a\tan\left(dx+c\right)+a}{\sqrt{e\cos\left(dx+c\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))/(e*cos(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)/sqrt(e*cos(d*x + c)), x)
```

mupad [B] time = 0.56, size = 74, normalized size = 1.23

$$\frac{2\,a\,\sqrt{\cos\left(c+d\,x\right)}\,\mathrm{F}\left(\frac{c}{2}+\frac{d\,x}{2}\middle|2\right)}{d\,\sqrt{e\,\cos\left(c+d\,x\right)}}+\frac{a\,\cos\left(c+d\,x\right)\,\sqrt{e\,\cos\left(c+d\,x\right)}\,4\mathrm{i}}{d\,e\,\left(\cos\left(2\,c+2\,d\,x\right)+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)/(e*cos(c + d*x))^(1/2),x)
```

```
[Out] (2*a*cos(c + d*x)^(1/2)*ellipticF(c/2 + (d*x)/2, 2))/(d*(e*cos(c + d*x))^(1
/2)) + (a*cos(c + d*x)*(e*cos(c + d*x))^(1/2)*4i)/(d*e*(cos(2*c + 2*d*x) +
1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$ia\left(\int\left(-\frac{i}{\sqrt{e\cos\left(c+dx\right)}}\right)dx+\int\frac{\tan\left(c+dx\right)}{\sqrt{e\cos\left(c+dx\right)}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))/(e*cos(d*x+c))**(1/2),x)
```

```
[Out] I*a*(Integral(-I/sqrt(e*cos(c + d*x)), x) + Integral(tan(c + d*x)/sqrt(e*co
s(c + d*x)), x))
```

3.660 $\int \frac{a+ia\tan(c+dx)}{(e\cos(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=89

$$\frac{2ia}{3d(e\cos(c+dx))^{3/2}}-\frac{2a\cos^{\frac{3}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d(e\cos(c+dx))^{3/2}}+\frac{2a\sin(c+dx)}{de\sqrt{e\cos(c+dx)}}$$

```
[Out] 2/3*I*a/d/(e*cos(d*x+c))^(3/2)-2*a*cos(d*x+c)^(3/2)*(cos(1/2*d*x+1/2*c)^2)^
(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/d/(e*cos(d*x
+c))^(3/2)+2*a*sin(d*x+c)/d/e/(e*cos(d*x+c))^(1/2)
```

Rubi [A] time = 0.10, antiderivative size = 92, normalized size of antiderivative = 1.03, number of steps used = 5, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {3515, 3486, 3768, 3771, 2639}

$$\frac{2ia}{3d(e\cos(c+dx))^{3/2}}-\frac{2a\cos^{\frac{3}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d(e\cos(c+dx))^{3/2}}+\frac{2a\sin(c+dx)\cos(c+dx)}{d(e\cos(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])/(e*Cos[c + d*x])^(3/2),x]
```

```
[Out] (((2*I)/3)*a)/(d*(e*Cos[c + d*x])^(3/2)) - (2*a*Cos[c + d*x]^(3/2)*Elliptic
E[(c + d*x)/2, 2])/(d*(e*Cos[c + d*x])^(3/2)) + (2*a*Cos[c + d*x]*Sin[c + d
*x])/(d*(e*Cos[c + d*x])^(3/2))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] && !IntegerQ[m]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{a+ia\tan(c+dx)}{(e\cos(c+dx))^{3/2}}\,dx = \frac{\int (e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))\,dx}{(e\cos(c+dx))^{3/2}(e\sec(c+dx))^{3/2}}$$

$$= \frac{2ia}{3d(e\cos(c+dx))^{3/2}} + \frac{a\int (e\sec(c+dx))^{3/2}\,dx}{(e\cos(c+dx))^{3/2}(e\sec(c+dx))^{3/2}}$$

$$= \frac{2ia}{3d(e\cos(c+dx))^{3/2}} + \frac{2a\cos(c+dx)\sin(c+dx)}{d(e\cos(c+dx))^{3/2}} - \frac{\left(ae^2\right)\int \frac{1}{\sqrt{e\sec(c+dx)}}\,dx}{(e\cos(c+dx))^{3/2}(e\sec(c+dx)}$$

$$= \frac{2ia}{3d(e\cos(c+dx))^{3/2}} + \frac{2a\cos(c+dx)\sin(c+dx)}{d(e\cos(c+dx))^{3/2}} - \frac{\left(a\cos^{\frac{3}{2}}(c+dx)\right)\int \sqrt{\cos(c+d}}{(e\cos(c+dx))^{3/2}}$$

$$= \frac{2ia}{3d(e\cos(c+dx))^{3/2}} - \frac{2a\cos^{\frac{3}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{d(e\cos(c+dx))^{3/2}} + \frac{2a\cos(c+dx)\sin(c+dx}{d(e\cos(c+dx))^{3/2}}$$

Mathematica [C] time = 3.79, size = 369, normalized size = 4.15

$$\frac{\cos^{\frac{5}{2}}(c+dx)(\cos(dx)-i\sin(dx))(a+ia\tan(c+dx))\left(\frac{2\sin(c)(\cot(c)-i)(3\csc(c)\cos(c+2dx)+3\cot(c)+2i)}{3\cos^{\frac{3}{2}}(c+dx)} - \frac{2\sqrt{2}(\cot(c)-i)e^{-idx}}{}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])/(e*Cos[c + d*x])^(3/2),x]
```

```
[Out] (Cos[c + d*x]^(5/2)*((-2*Sqrt[2]*(-I + Cot[c])*(3 + 3*E^((2*I)*(c + d*x)) +
 3*Sqrt[1 - I*E^(I*(c + d*x))]*Sqrt[E^(I*(c + d*x))*(-I + E^(I*(c + d*x)))]
*EllipticE[ArcSin[Sqrt[(-I)*Cos[c + d*x] + Sin[c + d*x]]], -1] - 3*Sqrt[1 -
 I*E^(I*(c + d*x))]*Sqrt[E^(I*(c + d*x))*(-I + E^(I*(c + d*x)))]*EllipticF[
ArcSin[Sqrt[(-I)*Cos[c + d*x] + Sin[c + d*x]]], -1] + E^((2*I)*d*x)*Sqrt[1
+ E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x)
)]))/(3*E^(I*d*x)*Sqrt[(1 + E^((2*I)*(c + d*x)))/E^(I*(c + d*x))]) + (2*(-I
 + Cot[c])*(2*I + 3*Cot[c] + 3*Cos[c + 2*d*x]*Csc[c])*Sin[c])/(3*Cos[c + d*
x]^(3/2)))*(Cos[d*x] - I*Sin[d*x])*(a + I*a*Tan[c + d*x]))/(2*d*(e*Cos[c +
d*x])^(3/2))
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\frac{\sqrt{\frac{1}{2}}\left(-12i\,ae^{(4i\,dx+4i\,c)} - 4i\,ae^{(2i\,dx+2i\,c)}\right)\sqrt{ee^{(2i\,dx+2i\,c)}+e}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)} + 3\left(de^2e^{(4i\,dx+4i\,c)} + 2\,de^2e^{(2i\,dx+2i\,c)} + de^2\right)\mathrm{in}}{3\left(de^2e^{(4i\,dx+4i\,c)} + 2\,de^2e^{(2i\,dx+2i\,c)} + de^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))/(e*cos(d*x+c))^(3/2),x, algorithm="fricas")
```

```
[Out] 1/3*(sqrt(1/2)*(-12*I*a*e^(4*I*d*x + 4*I*c) - 4*I*a*e^(2*I*d*x + 2*I*c))*sq
rt(e*e^(2*I*d*x + 2*I*c) + e)*e^(-1/2*I*d*x - 1/2*I*c) + 3*(d*e^2*e^(4*I*d*
x + 4*I*c) + 2*d*e^2*e^(2*I*d*x + 2*I*c) + d*e^2)*integral(2*I*sqrt(1/2)*sq
rt(e*e^(2*I*d*x + 2*I*c) + e)*a*e^(1/2*I*d*x + 1/2*I*c)/(d*e^2*e^(2*I*d*x +
 2*I*c) + d*e^2), x))/(d*e^2*e^(4*I*d*x + 4*I*c) + 2*d*e^2*e^(2*I*d*x + 2*I
*c) + d*e^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{i\,a\tan(dx+c)+a}{(e\cos(dx+c))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))/(e*cos(d*x+c))^(3/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)/(e*cos(d*x + c))^(3/2), x)
```

maple [B] time = 7.90, size = 214, normalized size = 2.40

$$-\frac{2\left(6\,\mathrm{EllipticE}\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\sqrt{2\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-12\left(\sin^{4}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cdots\right.}{3\left(2\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))/(e*cos(d*x+c))^(3/2),x)
```

```
[Out] -2/3/(2*sin(1/2*d*x+1/2*c)^2-1)/sin(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1/2*c)^2
*e+e)^(1/2)/e*(6*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*(2*sin(1/2*d*x+1/2*c
)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*sin(1/2*d*x+1/2*c)^2-12*sin(1/2*d
*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*
x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+6*sin(1/2*d*x+1/2
*c)^2*cos(1/2*d*x+1/2*c)+I*sin(1/2*d*x+1/2*c))*a/d
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{i\,a\tan\left(dx+c\right)+a}{\left(e\cos\left(dx+c\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))/(e*cos(d*x+c))^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)/(e*cos(d*x + c))^(3/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+a\tan\left(c+d\,x\right)\,1{}\mathrm{i}}{{\left(e\,\cos\left(c+d\,x\right)\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)/(e*cos(c + d*x))^(3/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)/(e*cos(c + d*x))^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$ia\left(\int\left(-\frac{i}{\left(e\cos\left(c+dx\right)\right)^{\frac{3}{2}}}\right)dx+\int\frac{\tan\left(c+dx\right)}{\left(e\cos\left(c+dx\right)\right)^{\frac{3}{2}}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))/(e*cos(d*x+c))**(3/2),x)
```

```
[Out] I*a*(Integral(-I/(e*cos(c + d*x))**(3/2), x) + Integral(tan(c + d*x)/(e*cos
(c + d*x))**(3/2), x))
```

3.661 $\int \frac{a+ia\tan(c+dx)}{(e\cos(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=96

$$\frac{2ia}{5d(e\cos(c+dx))^{5/2}}+\frac{2a\cos^{\frac{5}{2}}(c+dx)F\left(\frac{1}{2}(c+dx)\middle|2\right)}{3d(e\cos(c+dx))^{5/2}}+\frac{2a\sin(c+dx)\cos(c+dx)}{3d(e\cos(c+dx))^{5/2}}$$

```
[Out] 2/5*I*a/d/(e*cos(d*x+c))^(5/2)+2/3*a*cos(d*x+c)^(5/2)*(cos(1/2*d*x+1/2*c)^2
)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/d/(e*cos(d
*x+c))^(5/2)+2/3*a*cos(d*x+c)*sin(d*x+c)/d/(e*cos(d*x+c))^(5/2)
```

Rubi [A] time = 0.10, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {3515, 3486, 3768, 3771, 2641}

$$\frac{2ia}{5d(e\cos(c+dx))^{5/2}}+\frac{2a\cos^{\frac{5}{2}}(c+dx)F\left(\frac{1}{2}(c+dx)\middle|2\right)}{3d(e\cos(c+dx))^{5/2}}+\frac{2a\sin(c+dx)\cos(c+dx)}{3d(e\cos(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])/(e*Cos[c + d*x])^(5/2),x]
```

```
[Out] (((2*I)/5)*a)/(d*(e*Cos[c + d*x])^(5/2)) + (2*a*Cos[c + d*x]^(5/2)*Elliptic
F[(c + d*x)/2, 2])/(3*d*(e*Cos[c + d*x])^(5/2)) + (2*a*Cos[c + d*x]*Sin[c +
 d*x])/(3*d*(e*Cos[c + d*x])^(5/2))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$
\begin{aligned}
\int \frac{a+ia\tan(c+dx)}{(e\cos(c+dx))^{5/2}}\,dx &= \frac{\int (e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))\,dx}{(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}}\\
&= \frac{2ia}{5d(e\cos(c+dx))^{5/2}}+\frac{a\int (e\sec(c+dx))^{5/2}\,dx}{(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}}\\
&= \frac{2ia}{5d(e\cos(c+dx))^{5/2}}+\frac{2a\cos(c+dx)\sin(c+dx)}{3d(e\cos(c+dx))^{5/2}}+\frac{\left(ae^2\right)\int \sqrt{e\sec(c+dx)}\,dx}{3(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}}\\
&= \frac{2ia}{5d(e\cos(c+dx))^{5/2}}+\frac{2a\cos(c+dx)\sin(c+dx)}{3d(e\cos(c+dx))^{5/2}}+\frac{\left(a\cos^{\frac{5}{2}}(c+dx)\right)\int \frac{1}{\sqrt{\cos(c+dx)}}\,dx}{3(e\cos(c+dx))^{5/2}}\\
&= \frac{2ia}{5d(e\cos(c+dx))^{5/2}}+\frac{2a\cos^{\frac{5}{2}}(c+dx)F\left(\frac{1}{2}(c+dx)\middle|2\right)}{3d(e\cos(c+dx))^{5/2}}+\frac{2a\cos(c+dx)\sin(c+dx)}{3d(e\cos(c+dx))^{5/2}}
\end{aligned}
$$

Mathematica [A] time = 0.52, size = 57, normalized size = 0.59

$$\frac{a\left(5\sin(2(c+dx))+10\cos^{\frac{5}{2}}(c+dx)F\left(\frac{1}{2}(c+dx)\middle|2\right)+6i\right)}{15d(e\cos(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])/(e*Cos[c + d*x])^(5/2),x]
```

```
[Out] (a*(6*I + 10*Cos[c + d*x]^(5/2)*EllipticF[(c + d*x)/2, 2] + 5*Sin[2*(c + d*
x)]))/(15*d*(e*Cos[c + d*x])^(5/2))
```

fricas [F] time = 0.56, size = 0, normalized size = 0.00

$$\frac{\sqrt{\frac{1}{2}}\left(-20i\,ae^{(5i\,dx+5i\,c)}+48i\,ae^{(3i\,dx+3i\,c)}+20i\,ae^{(i\,dx+i\,c)}\right)\sqrt{ee^{(2i\,dx+2i\,c)}+e}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}+15\left(de^3e^{(6i\,dx+6i\,c)}+3\,de^3e^{(4i\cdots}\right.}{15\left(de^3e^{(6i\,dx+6i\,c)}+3\,de^3e^{(4i\,dx+4i\,c)}+3\,de^3e^{(2i\,dx+2\cdots}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))/(e*cos(d*x+c))^(5/2),x, algorithm="fricas")
```

```
[Out] 1/15*(sqrt(1/2)*(-20*I*a*e^(5*I*d*x + 5*I*c) + 48*I*a*e^(3*I*d*x + 3*I*c) +
 20*I*a*e^(I*d*x + I*c))*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*e^(-1/2*I*d*x - 1/
2*I*c) + 15*(d*e^3*e^(6*I*d*x + 6*I*c) + 3*d*e^3*e^(4*I*d*x + 4*I*c) + 3*d*
e^3*e^(2*I*d*x + 2*I*c) + d*e^3)*integral(-2/3*I*sqrt(1/2)*sqrt(e*e^(2*I*d*
x + 2*I*c) + e)*a*e^(-1/2*I*d*x - 1/2*I*c)/(d*e^3*e^(2*I*d*x + 2*I*c) + d*e
^3), x))/(d*e^3*e^(6*I*d*x + 6*I*c) + 3*d*e^3*e^(4*I*d*x + 4*I*c) + 3*d*e^3
*e^(2*I*d*x + 2*I*c) + d*e^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{i\,a\tan(dx+c)+a}{(e\cos(dx+c))^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))/(e*cos(d*x+c))^(5/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)/(e*cos(d*x + c))^(5/2), x)
```

maple [B] time = 10.04, size = 283, normalized size = 2.95

$$\frac{2\left(-20\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\ \mathrm{EllipticF}\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+20\sqrt{2\left(\sin^2\left(\frac{dx}{2}\right.\right.}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))/(e*cos(d*x+c))^(5/2),x)
```

```
[Out] 2/15/(4*sin(1/2*d*x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2+1)/sin(1/2*d*x+1/2*c)/(
-2*sin(1/2*d*x+1/2*c)^2*e+e)^(1/2)/e^2*(-20*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2
)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/
2*d*x+1/2*c)^4+20*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(
1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2-20*sin(1/2*
d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d
*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+10*sin(1/2*d*x+1
/2*c)^2*cos(1/2*d*x+1/2*c)+3*I*sin(1/2*d*x+1/2*c))*a/d
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{i\,a\tan\left(dx+c\right)+a}{\left(e\cos\left(dx+c\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))/(e*cos(d*x+c))^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)/(e*cos(d*x + c))^(5/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+a\tan\left(c+d\,x\right)\,1{}\mathrm{i}}{{\left(e\,\cos\left(c+d\,x\right)\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)/(e*cos(c + d*x))^(5/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)/(e*cos(c + d*x))^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.662 $\int \frac{a+ia\tan(c+dx)}{(e\cos(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=130

$$\frac{2ia}{7d(e\cos(c+dx))^{7/2}}-\frac{6a\cos^{\frac{7}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d(e\cos(c+dx))^{7/2}}+\frac{6a\sin(c+dx)\cos^3(c+dx)}{5d(e\cos(c+dx))^{7/2}}+\frac{2a\sin(c+dx)\cos(c+dx)}{5d(e\cos(c+dx))^{7/2}}$$

```
[Out] 2/7*I*a/d/(e*cos(d*x+c))^(7/2)-6/5*a*cos(d*x+c)^(7/2)*(cos(1/2*d*x+1/2*c)^2
)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/d/(e*cos(d
*x+c))^(7/2)+2/5*a*cos(d*x+c)*sin(d*x+c)/d/(e*cos(d*x+c))^(7/2)+6/5*a*cos(d
*x+c)^3*sin(d*x+c)/d/(e*cos(d*x+c))^(7/2)
```

Rubi [A] time = 0.13, antiderivative size = 130, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {3515, 3486, 3768, 3771, 2639}

$$\frac{2ia}{7d(e\cos(c+dx))^{7/2}}+\frac{6a\sin(c+dx)\cos^3(c+dx)}{5d(e\cos(c+dx))^{7/2}}-\frac{6a\cos^{\frac{7}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d(e\cos(c+dx))^{7/2}}+\frac{2a\sin(c+dx)\cos(c+dx)}{5d(e\cos(c+dx))^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + I*a*Tan[c + d*x])/(e*Cos[c + d*x])^(7/2),x]
```

```
[Out] (((2*I)/7)*a)/(d*(e*Cos[c + d*x])^(7/2)) - (6*a*Cos[c + d*x]^(7/2)*Elliptic
E[(c + d*x)/2, 2])/(5*d*(e*Cos[c + d*x])^(7/2)) + (2*a*Cos[c + d*x]*Sin[c +
 d*x])/(5*d*(e*Cos[c + d*x])^(7/2)) + (6*a*Cos[c + d*x]^3*Sin[c + d*x])/(5*
d*(e*Cos[c + d*x])^(7/2))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
```

```
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{a+ia\tan(c+dx)}{(e\cos(c+dx))^{7/2}}\,dx = \frac{\int (e\sec(c+dx))^{7/2}(a+ia\tan(c+dx))\,dx}{(e\cos(c+dx))^{7/2}(e\sec(c+dx))^{7/2}}$$

$$= \frac{2ia}{7d(e\cos(c+dx))^{7/2}} + \frac{a\int (e\sec(c+dx))^{7/2}\,dx}{(e\cos(c+dx))^{7/2}(e\sec(c+dx))^{7/2}}$$

$$= \frac{2ia}{7d(e\cos(c+dx))^{7/2}} + \frac{2a\cos(c+dx)\sin(c+dx)}{5d(e\cos(c+dx))^{7/2}} + \frac{\left(3ae^2\right)\int (e\sec(c+dx))^{3/2}\,d}{5(e\cos(c+dx))^{7/2}(e\sec(c+dx}$$

$$= \frac{2ia}{7d(e\cos(c+dx))^{7/2}} + \frac{2a\cos(c+dx)\sin(c+dx)}{5d(e\cos(c+dx))^{7/2}} + \frac{6a\cos^3(c+dx)\sin(c+dx)}{5d(e\cos(c+dx))^{7/2}} -$$

$$= \frac{2ia}{7d(e\cos(c+dx))^{7/2}} + \frac{2a\cos(c+dx)\sin(c+dx)}{5d(e\cos(c+dx))^{7/2}} + \frac{6a\cos^3(c+dx)\sin(c+dx)}{5d(e\cos(c+dx))^{7/2}} -$$

$$= \frac{2ia}{7d(e\cos(c+dx))^{7/2}} - \frac{6a\cos^{\frac{7}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5d(e\cos(c+dx))^{7/2}} + \frac{2a\cos(c+dx)\sin(c+dx}{5d(e\cos(c+dx))^{7/2}}$$

Mathematica [C] time = 6.33, size = 390, normalized size = 3.00

$$\frac{\cos^{\frac{9}{2}}(c+dx)(\cos(dx)-i\sin(dx))(a+ia\tan(c+dx))\left(\frac{(\cot(c)-i)(77\cos(c+2dx)+7\cos(3c+2dx)+21\cos(3c+4dx)+40i\sin(c)+63\cos}{70\cos^{\frac{7}{2}}(c+dx)}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + I*a*Tan[c + d*x])/(e*Cos[c + d*x])^(7/2),x]
```

```
[Out] (Cos[c + d*x]^(9/2)*((-2*Sqrt[2]*(-I + Cot[c])*(3 + 3*E^((2*I)*(c + d*x)) +
 3*Sqrt[1 - I*E^(I*(c + d*x))]*Sqrt[E^(I*(c + d*x))*(-I + E^(I*(c + d*x)))]
*EllipticE[ArcSin[Sqrt[(-I)*Cos[c + d*x] + Sin[c + d*x]]], -1] - 3*Sqrt[1 -
 I*E^(I*(c + d*x))]*Sqrt[E^(I*(c + d*x))*(-I + E^(I*(c + d*x)))]*EllipticF[
ArcSin[Sqrt[(-I)*Cos[c + d*x] + Sin[c + d*x]]], -1] + E^((2*I)*d*x)*Sqrt[1
+ E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x)
)]))/(5*E^(I*d*x)*Sqrt[(1 + E^((2*I)*(c + d*x)))/E^(I*(c + d*x))]) + ((-I +
 Cot[c])*(63*Cos[c] + 77*Cos[c + 2*d*x] + 7*Cos[3*c + 2*d*x] + 21*Cos[3*c +
 4*d*x] + (40*I)*Sin[c]))/(70*Cos[c + d*x]^(7/2)))*(Cos[d*x] - I*Sin[d*x])*
(a + I*a*Tan[c + d*x]))/(2*d*(e*Cos[c + d*x])^(7/2))
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\frac{\sqrt{\frac{1}{2}}\left(-84i\,ae^{(8i\,dx+8i\,c)} - 308i\,ae^{(6i\,dx+6i\,c)} - 92i\,ae^{(4i\,dx+4i\,c)} - 28i\,ae^{(2i\,dx+2i\,c)}\right)\sqrt{ee^{(2i\,dx+2i\,c)}+e}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)} + 35\,(d}{35\left(de^4e^{(8i\,dx+8i\,c)} + 4\,de^4e^{(6i\,dx+6i\,c)} + \right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))/(e*cos(d*x+c))^(7/2),x, algorithm="fricas")
```

```
[Out] 1/35*(sqrt(1/2)*(-84*I*a*e^(8*I*d*x + 8*I*c) - 308*I*a*e^(6*I*d*x + 6*I*c)
- 92*I*a*e^(4*I*d*x + 4*I*c) - 28*I*a*e^(2*I*d*x + 2*I*c))*sqrt(e*e^(2*I*d*
x + 2*I*c) + e)*e^(-1/2*I*d*x - 1/2*I*c) + 35*(d*e^4*e^(8*I*d*x + 8*I*c) +
```

```
4*d*e^4*e^(6*I*d*x + 6*I*c) + 6*d*e^4*e^(4*I*d*x + 4*I*c) + 4*d*e^4*e^(2*I*
d*x + 2*I*c) + d*e^4)*integral(6/5*I*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) +
 e)*a*e^(1/2*I*d*x + 1/2*I*c)/(d*e^4*e^(2*I*d*x + 2*I*c) + d*e^4), x))/(d*e
^4*e^(8*I*d*x + 8*I*c) + 4*d*e^4*e^(6*I*d*x + 6*I*c) + 6*d*e^4*e^(4*I*d*x +
 4*I*c) + 4*d*e^4*e^(2*I*d*x + 2*I*c) + d*e^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{i\,a\tan\left(dx+c\right)+a}{\left(e\cos\left(dx+c\right)\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))/(e*cos(d*x+c))^(7/2),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)/(e*cos(d*x + c))^(7/2), x)
```

maple [B] time = 16.46, size = 396, normalized size = 3.05

$$-\frac{2\left(168\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\;\mathrm{EllipticE}\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\sin^{6}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-336\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))/(e*cos(d*x+c))^(7/2),x)
```

```
[Out] -2/35/(8*sin(1/2*d*x+1/2*c)^6-12*sin(1/2*d*x+1/2*c)^4+6*sin(1/2*d*x+1/2*c)^
2-1)/sin(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1/2*c)^2*e+e)^(1/2)/e^3*(168*(sin(1
/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d
*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^6-336*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+
1/2*c)^8-252*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*(2*sin(1/2*d*x+1/2*c)^2-
1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*sin(1/2*d*x+1/2*c)^4+504*cos(1/2*d*x+
1/2*c)*sin(1/2*d*x+1/2*c)^6+126*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))*(2*si
n(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*sin(1/2*d*x+1/2*c)
^2-280*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-21*(sin(1/2*d*x+1/2*c)^2)^(1
/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+
56*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+5*I*sin(1/2*d*x+1/2*c))*a/d
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{i\,a\tan\left(dx+c\right)+a}{\left(e\cos\left(dx+c\right)\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))/(e*cos(d*x+c))^(7/2),x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)/(e*cos(d*x + c))^(7/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+a\tan\left(c+d\,x\right)\,1{}\mathrm{i}}{{\left(e\,\cos\left(c+d\,x\right)\right)}^{7/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)/(e*cos(c + d*x))^(7/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)/(e*cos(c + d*x))^(7/2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))/(e*cos(d*x+c))**(7/2),x)
```

```
[Out] Timed out
```

3.663 $\int \frac{(e\cos(c+dx))^{7/2}}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=190

$$\frac{2F\left(\frac{1}{2}(c+dx)\middle|2\right)(e\cos(c+dx))^{7/2}}{7a^2d\cos^{\frac{7}{2}}(c+dx)}+\frac{4i\cos^2(c+dx)(e\cos(c+dx))^{7/2}}{15d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{2\sin(c+dx)\cos(c+dx)(e\cos(c+dx))^{7/2}}{15a^2d}$$

```
[Out] 2/7*(e*cos(d*x+c))^(7/2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*El
lipticF(sin(1/2*d*x+1/2*c),2^(1/2))/a^2/d/cos(d*x+c)^(7/2)+2/15*cos(d*x+c)*
(e*cos(d*x+c))^(7/2)*sin(d*x+c)/a^2/d+6/35*(e*cos(d*x+c))^(7/2)*tan(d*x+c)/
a^2/d+2/7*(e*cos(d*x+c))^(7/2)*sec(d*x+c)^2*tan(d*x+c)/a^2/d+4/15*I*cos(d*x
+c)^2*(e*cos(d*x+c))^(7/2)/d/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.22, antiderivative size = 190, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used = {3515, 3500, 3769, 3771, 2641}

$$\frac{4i\cos^2(c+dx)(e\cos(c+dx))^{7/2}}{15d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{2F\left(\frac{1}{2}(c+dx)\middle|2\right)(e\cos(c+dx))^{7/2}}{7a^2d\cos^{\frac{7}{2}}(c+dx)}+\frac{2\sin(c+dx)\cos(c+dx)(e\cos(c+dx))^{7/2}}{15a^2d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cos[c + d*x])^(7/2)/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (2*(e*Cos[c + d*x])^(7/2)*EllipticF[(c + d*x)/2, 2])/(7*a^2*d*Cos[c + d*x]^
(7/2)) + (2*Cos[c + d*x]*(e*Cos[c + d*x])^(7/2)*Sin[c + d*x])/(15*a^2*d) +
(6*(e*Cos[c + d*x])^(7/2)*Tan[c + d*x])/(35*a^2*d) + (2*(e*Cos[c + d*x])^(7
/2)*Sec[c + d*x]^2*Tan[c + d*x])/(7*a^2*d) + (((4*I)/15)*Cos[c + d*x]^2*(e*
Cos[c + d*x])^(7/2))/(d*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
```

]

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\cos(c+dx))^{7/2}}{(a+ia\tan(c+dx))^2}\,dx = \left((e\cos(c+dx))^{7/2}(e\sec(c+dx))^{7/2}\right)\int \frac{1}{(e\sec(c+dx))^{7/2}(a+ia\tan(c+dx))^2}\,dx$$

$$= \frac{4i\cos^2(c+dx)(e\cos(c+dx))^{7/2}}{15d\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(11e^2(e\cos(c+dx))^{7/2}(e\sec(c+dx))^{7/2}\right)\int \frac{}{(e}}{15a^2}$$

$$= \frac{2\cos(c+dx)(e\cos(c+dx))^{7/2}\sin(c+dx)}{15a^2d} + \frac{4i\cos^2(c+dx)(e\cos(c+dx))^{7/2}}{15d\left(a^2+ia^2\tan(c+dx)\right)} +$$

$$= \frac{2\cos(c+dx)(e\cos(c+dx))^{7/2}\sin(c+dx)}{15a^2d} + \frac{6(e\cos(c+dx))^{7/2}\tan(c+dx)}{35a^2d} + \frac{4}{}$$

$$= \frac{2\cos(c+dx)(e\cos(c+dx))^{7/2}\sin(c+dx)}{15a^2d} + \frac{6(e\cos(c+dx))^{7/2}\tan(c+dx)}{35a^2d} + \frac{2}{}$$

$$= \frac{2\cos(c+dx)(e\cos(c+dx))^{7/2}\sin(c+dx)}{15a^2d} + \frac{6(e\cos(c+dx))^{7/2}\tan(c+dx)}{35a^2d} + \frac{2}{}$$

$$= \frac{2(e\cos(c+dx))^{7/2}F\left(\frac{1}{2}(c+dx)\middle|2\right)}{7a^2d\cos^{\frac{7}{2}}(c+dx)} + \frac{2\cos(c+dx)(e\cos(c+dx))^{7/2}\sin(c+dx)}{15a^2d}$$

Mathematica [A] time = 1.25, size = 156, normalized size = 0.82

$$\frac{e^3\sqrt{e\cos(c+dx)}\left(\sqrt{\cos(c+dx)}\,(134\sin(c+dx)-117\sin(3(c+dx))-11\sin(5(c+dx))-296i\cos(c+dx)+\right.}{840a^2d\cos^{\frac{5}{2}}(c+dx)(\tan(}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cos[c + d*x])^(7/2)/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (e^3*Sqrt[e*Cos[c + d*x]]*(-240*EllipticF[(c + d*x)/2, 2]*(Cos[2*(c + d*x)]
 + I*Sin[2*(c + d*x)]) + Sqrt[Cos[c + d*x]]*((-296*I)*Cos[c + d*x] + (68*I)
*Cos[3*(c + d*x)] + (4*I)*Cos[5*(c + d*x)] + 134*Sin[c + d*x] - 117*Sin[3*(
c + d*x)] - 11*Sin[5*(c + d*x)])))/(840*a^2*d*Cos[c + d*x]^(5/2)*(-I + Tan[
c + d*x])^2)
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\frac{\left(1680\,a^2de^{(7i\,dx+7i\,c)}\mathrm{integral}\left(-\frac{2i\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\,e^3e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{7\left(a^2de^{(2i\,dx+2i\,c)}+a^2d\right)},x\right)+\sqrt{\frac{1}{2}}\left(-15i\,e^3e^{(10i\,dx+10i\,c)}-185i\,e^3e^{(8i\,dx+8i\,c)}+\right.\right.}{1680\,a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/1680*(1680*a^2*d*e^(7*I*d*x + 7*I*c)*integral(-2/7*I*sqrt(1/2)*sqrt(e*e^(
2*I*d*x + 2*I*c) + e)*e^3*e^(-1/2*I*d*x - 1/2*I*c)/(a^2*d*e^(2*I*d*x + 2*I*
c) + a^2*d), x) + sqrt(1/2)*(-15*I*e^3*e^(10*I*d*x + 10*I*c) - 185*I*e^3*e^
(8*I*d*x + 8*I*c) + 430*I*e^3*e^(6*I*d*x + 6*I*c) + 162*I*e^3*e^(4*I*d*x +
4*I*c) + 49*I*e^3*e^(2*I*d*x + 2*I*c) + 7*I*e^3)*sqrt(e*e^(2*I*d*x + 2*I*c)
 + e)*e^(-1/2*I*d*x - 1/2*I*c))*e^(-7*I*d*x - 7*I*c)/(a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cos(dx+c))^{\frac{7}{2}}}{(ia\tan(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((e*cos(d*x + c))^(7/2)/(I*a*tan(d*x + c) + a)^2, x)
```

maple [B] time = 6.93, size = 387, normalized size = 2.04

$$2e^4\left(-224i\left(\sin^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-3584\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^{16}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+15680i\left(\sin^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+12544\left(\sin^{14}\left(\frac{dx}{2}+\frac{c}{2}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 2/105/a^2/sin(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1/2*c)^2*e+e)^(1/2)*e^4*(-224*
I*sin(1/2*d*x+1/2*c)^3-3584*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^16+15680*
I*sin(1/2*d*x+1/2*c)^9+12544*sin(1/2*d*x+1/2*c)^14*cos(1/2*d*x+1/2*c)+1568*
I*sin(1/2*d*x+1/2*c)^5-19264*sin(1/2*d*x+1/2*c)^12*cos(1/2*d*x+1/2*c)+25088
*I*sin(1/2*d*x+1/2*c)^13+16800*sin(1/2*d*x+1/2*c)^10*cos(1/2*d*x+1/2*c)+358
4*I*sin(1/2*d*x+1/2*c)^17-9104*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8-6272
*I*sin(1/2*d*x+1/2*c)^7+3128*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6-14336*
I*sin(1/2*d*x+1/2*c)^15-700*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-25088*I
*sin(1/2*d*x+1/2*c)^11-15*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c
)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+90*sin(1/2*d*x+1/2*c)^2*
cos(1/2*d*x+1/2*c)+14*I*sin(1/2*d*x+1/2*c))/d
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(e\cos(c+dx))^{7/2}}{(a+a\tan(c+dx)\,1\mathrm{i})^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^(7/2)/(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] int((e*cos(c + d*x))^(7/2)/(a + a*tan(c + d*x)*1i)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**(7/2)/(a+I*a*tan(d*x+c))**2,x)
[Out] Timed out
```

3.664 $\int \frac{(e\cos(c+dx))^{5/2}}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=154

$$\frac{42E\left(\frac{1}{2}(c+dx)\middle|2\right)(e\cos(c+dx))^{5/2}}{65a^2d\cos^{\frac{5}{2}}(c+dx)}+\frac{4i\cos^2(c+dx)(e\cos(c+dx))^{5/2}}{13d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{2\sin(c+dx)\cos(c+dx)(e\cos(c+dx))^{5/2}}{13a^2d}$$

```
[Out] 42/65*(e*cos(d*x+c))^(5/2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*
EllipticE(sin(1/2*d*x+1/2*c),2^(1/2))/a^2/d/cos(d*x+c)^(5/2)+2/13*cos(d*x+c
)*(e*cos(d*x+c))^(5/2)*sin(d*x+c)/a^2/d+14/65*(e*cos(d*x+c))^(5/2)*tan(d*x+
c)/a^2/d+4/13*I*cos(d*x+c)^2*(e*cos(d*x+c))^(5/2)/d/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.19, antiderivative size = 154, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {3515, 3500, 3769, 3771, 2639}

$$\frac{4i\cos^2(c+dx)(e\cos(c+dx))^{5/2}}{13d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{42E\left(\frac{1}{2}(c+dx)\middle|2\right)(e\cos(c+dx))^{5/2}}{65a^2d\cos^{\frac{5}{2}}(c+dx)}+\frac{2\sin(c+dx)\cos(c+dx)(e\cos(c+dx))^{5/2}}{13a^2d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cos[c + d*x])^(5/2)/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (42*(e*Cos[c + d*x])^(5/2)*EllipticE[(c + d*x)/2, 2])/(65*a^2*d*Cos[c + d*x
]^(5/2)) + (2*Cos[c + d*x]*(e*Cos[c + d*x])^(5/2)*Sin[c + d*x])/(13*a^2*d)
+ (14*(e*Cos[c + d*x])^(5/2)*Tan[c + d*x])/(65*a^2*d) + (((4*I)/13)*Cos[c +
 d*x]^2*(e*Cos[c + d*x])^(5/2))/(d*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\cos(c+dx))^{5/2}}{(a+ia\tan(c+dx))^2}\,dx = \left((e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}\right)\int \frac{1}{(e\sec(c+dx))^{5/2}(a+ia\tan(c+dx))^2}\,dx$$

$$= \frac{4i\cos^2(c+dx)(e\cos(c+dx))^{5/2}}{13d\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(9e^2(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}\right)\int \frac{}{(e\,\mathrm{se}}}{13a^2}$$

$$= \frac{2\cos(c+dx)(e\cos(c+dx))^{5/2}\sin(c+dx)}{13a^2d} + \frac{4i\cos^2(c+dx)(e\cos(c+dx))^{5/2}}{13d\left(a^2+ia^2\tan(c+dx)\right)} +$$

$$= \frac{2\cos(c+dx)(e\cos(c+dx))^{5/2}\sin(c+dx)}{13a^2d} + \frac{14(e\cos(c+dx))^{5/2}\tan(c+dx)}{65a^2d} +$$

$$= \frac{2\cos(c+dx)(e\cos(c+dx))^{5/2}\sin(c+dx)}{13a^2d} + \frac{14(e\cos(c+dx))^{5/2}\tan(c+dx)}{65a^2d} +$$

$$= \frac{42(e\cos(c+dx))^{5/2}E\left(\frac{1}{2}(c+dx)\middle|2\right)}{65a^2d\cos^{\frac{5}{2}}(c+dx)} + \frac{2\cos(c+dx)(e\cos(c+dx))^{5/2}\sin(c+dx)}{13a^2d}$$

Mathematica [C] time = 3.05, size = 471, normalized size = 3.06

$$(\cos(dx)+i\sin(dx))^2(e\cos(c+dx))^{5/2}\left(\frac{14\sqrt{2}\csc(c)e^{-idx}(\cos(2c)+i\sin(2c))\left(e^{2idx}\sqrt{1+e^{2i(c+dx)}}\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)+3e^{2i(c+dx)}-3\sqrt{}\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cos[c + d*x])^(5/2)/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] ((e*Cos[c + d*x])^(5/2)*(Cos[d*x] + I*Sin[d*x])^2*((14*Sqrt[2]*Csc[c]*(3 +
3*E^((2*I)*(c + d*x)) + 3*Sqrt[1 - I*E^(I*(c + d*x))]*Sqrt[E^(I*(c + d*x))*
(-I + E^(I*(c + d*x)))]*EllipticE[ArcSin[Sqrt[(-I)*Cos[c + d*x] + Sin[c + d
*x]]], -1] - 3*Sqrt[1 - I*E^(I*(c + d*x))]*Sqrt[E^(I*(c + d*x))*(-I + E^(I*
(c + d*x)))]*EllipticF[ArcSin[Sqrt[(-I)*Cos[c + d*x] + Sin[c + d*x]]], -1]
+ E^((2*I)*d*x)*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/2, 3/4, 7
/4, -E^((2*I)*(c + d*x))])*(Cos[2*c] + I*Sin[2*c]))/(65*E^(I*d*x)*Sqrt[(1 +
 E^((2*I)*(c + d*x)))/E^(I*(c + d*x))]) - (Sqrt[Cos[c + d*x]]*Csc[c]*(Cos[2
*d*x] - I*Sin[2*d*x])*(178*Cos[c + 2*d*x] + 158*Cos[3*c + 2*d*x] - 9*Cos[3*
c + 4*d*x] + 9*Cos[5*c + 4*d*x] - (88*I)*Sin[c] + (208*I)*Sin[c + 2*d*x] +
(128*I)*Sin[3*c + 2*d*x] - (4*I)*Sin[3*c + 4*d*x] + (4*I)*Sin[5*c + 4*d*x])
)/260))/(2*d*Cos[c + d*x]^(9/2)*(a + I*a*Tan[c + d*x])^2)
```

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\sqrt{\frac{1}{2}}\left(-13i\,e^2e^{(9i\,dx+9i\,c)}+13i\,e^2e^{(8i\,dx+8i\,c)}-286i\,e^2e^{(7i\,dx+7i\,c)}-386i\,e^2e^{(6i\,dx+6i\,c)}+88i\,e^2e^{(5i\,dx+5i\,c)}-88i\,e^2e^{(4i\,dx+}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/520*(sqrt(1/2)*(-13*I*e^2*e^(9*I*d*x + 9*I*c) + 13*I*e^2*e^(8*I*d*x + 8*I
*c) - 286*I*e^2*e^(7*I*d*x + 7*I*c) - 386*I*e^2*e^(6*I*d*x + 6*I*c) + 88*I*
e^2*e^(5*I*d*x + 5*I*c) - 88*I*e^2*e^(4*I*d*x + 4*I*c) + 30*I*e^2*e^(3*I*d*
x + 3*I*c) - 30*I*e^2*e^(2*I*d*x + 2*I*c) + 5*I*e^2*e^(I*d*x + I*c) - 5*I*e
^2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*e^(-1/2*I*d*x - 1/2*I*c) + 520*(a^2*d*e
^(7*I*d*x + 7*I*c) - a^2*d*e^(6*I*d*x + 6*I*c))*integral(1/65*sqrt(1/2)*(-4
2*I*e^2*e^(2*I*d*x + 2*I*c) - 84*I*e^2*e^(I*d*x + I*c) - 42*I*e^2)*sqrt(e*e
^(2*I*d*x + 2*I*c) + e)*e^(-1/2*I*d*x - 1/2*I*c)/(a^2*d*e^(4*I*d*x + 4*I*c)
 - 2*a^2*d*e^(3*I*d*x + 3*I*c) + 2*a^2*d*e^(2*I*d*x + 2*I*c) - 2*a^2*d*e^(I
*d*x + I*c) + a^2*d), x))/(a^2*d*e^(7*I*d*x + 7*I*c) - a^2*d*e^(6*I*d*x + 6
*I*c))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cos(dx+c))^{\frac{5}{2}}}{(ia\tan(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((e*cos(d*x + c))^(5/2)/(I*a*tan(d*x + c) + a)^2, x)
```

maple [B] time = 6.58, size = 351, normalized size = 2.28

$$-\frac{2e^3\left(140i\left(\sin^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1280\left(\sin^{14}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-5600i\left(\sin^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+3840\left(\sin^{12}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] -2/65/a^2/sin(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1/2*c)^2*e+e)^(1/2)*e^3*(140*I
*sin(1/2*d*x+1/2*c)^3-1280*sin(1/2*d*x+1/2*c)^14*cos(1/2*d*x+1/2*c)-5600*I*
sin(1/2*d*x+1/2*c)^9+3840*sin(1/2*d*x+1/2*c)^12*cos(1/2*d*x+1/2*c)-4480*I*s
in(1/2*d*x+1/2*c)^13-4960*sin(1/2*d*x+1/2*c)^10*cos(1/2*d*x+1/2*c)-840*I*si
n(1/2*d*x+1/2*c)^5+3520*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8+2800*I*sin(
1/2*d*x+1/2*c)^7-1496*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6+1280*I*sin(1/
2*d*x+1/2*c)^15+376*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-10*I*sin(1/2*d*
x+1/2*c)-21*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*E
llipticE(cos(1/2*d*x+1/2*c),2^(1/2))-44*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/
2*c)+6720*I*sin(1/2*d*x+1/2*c)^11)/d
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(e\,\cos(c+d\,x))^{5/2}}{(a+a\,\tan(c+d\,x)\,1{\mathrm{i}})^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^(5/2)/(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] int((e*cos(c + d*x))^(5/2)/(a + a*tan(c + d*x)*1i)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**(5/2)/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Timed out
```

3.665 $\int \frac{(e\cos(c+dx))^{3/2}}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=154

$$\frac{10F\left(\frac{1}{2}(c+dx)\middle|2\right)(e\cos(c+dx))^{3/2}}{33a^2d\cos^{\frac{3}{2}}(c+dx)}+\frac{4i\cos^2(c+dx)(e\cos(c+dx))^{3/2}}{11d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{2\sin(c+dx)\cos(c+dx)(e\cos(c+dx))^{3/2}}{11a^2d}$$

```
[Out] 10/33*(e*cos(d*x+c))^(3/2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*
EllipticF(sin(1/2*d*x+1/2*c),2^(1/2))/a^2/d/cos(d*x+c)^(3/2)+2/11*cos(d*x+c
)*(e*cos(d*x+c))^(3/2)*sin(d*x+c)/a^2/d+10/33*(e*cos(d*x+c))^(3/2)*tan(d*x+
c)/a^2/d+4/11*I*cos(d*x+c)^2*(e*cos(d*x+c))^(3/2)/d/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.20, antiderivative size = 154, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {3515, 3500, 3769, 3771, 2641}

$$\frac{4i\cos^2(c+dx)(e\cos(c+dx))^{3/2}}{11d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{10F\left(\frac{1}{2}(c+dx)\middle|2\right)(e\cos(c+dx))^{3/2}}{33a^2d\cos^{\frac{3}{2}}(c+dx)}+\frac{2\sin(c+dx)\cos(c+dx)(e\cos(c+dx))^{3/2}}{11a^2d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cos[c + d*x])^(3/2)/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (10*(e*Cos[c + d*x])^(3/2)*EllipticF[(c + d*x)/2, 2])/(33*a^2*d*Cos[c + d*x
]^(3/2)) + (2*Cos[c + d*x]*(e*Cos[c + d*x])^(3/2)*Sin[c + d*x])/(11*a^2*d)
+ (10*(e*Cos[c + d*x])^(3/2)*Tan[c + d*x])/(33*a^2*d) + (((4*I)/11)*Cos[c +
 d*x]^2*(e*Cos[c + d*x])^(3/2))/(d*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{(e\cos(c+dx))^{3/2}}{(a+ia\tan(c+dx))^2}\,dx = \left((e\cos(c+dx))^{3/2}(e\sec(c+dx))^{3/2}\right)\int \frac{1}{(e\sec(c+dx))^{3/2}(a+ia\tan(c+dx))^2}\,dx$$

$$= \frac{4i\cos^2(c+dx)(e\cos(c+dx))^{3/2}}{11d\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(7e^2(e\cos(c+dx))^{3/2}(e\sec(c+dx))^{3/2}\right)\int \frac{}{(e\,\mathrm{se}}}{11a^2}$$

$$= \frac{2\cos(c+dx)(e\cos(c+dx))^{3/2}\sin(c+dx)}{11a^2d} + \frac{4i\cos^2(c+dx)(e\cos(c+dx))^{3/2}}{11d\left(a^2+ia^2\tan(c+dx)\right)} +$$

$$= \frac{2\cos(c+dx)(e\cos(c+dx))^{3/2}\sin(c+dx)}{11a^2d} + \frac{10(e\cos(c+dx))^{3/2}\tan(c+dx)}{33a^2d} +$$

$$= \frac{2\cos(c+dx)(e\cos(c+dx))^{3/2}\sin(c+dx)}{11a^2d} + \frac{10(e\cos(c+dx))^{3/2}\tan(c+dx)}{33a^2d} +$$

$$= \frac{10(e\cos(c+dx))^{3/2}F\left(\frac{1}{2}(c+dx)\middle|2\right)}{33a^2d\cos^{\frac{3}{2}}(c+dx)} + \frac{2\cos(c+dx)(e\cos(c+dx))^{3/2}\sin(c+dx)}{11a^2d}$$

Mathematica [A] time = 0.68, size = 131, normalized size = 0.85

$$\frac{(e\cos(c+dx))^{3/2}\left(\sqrt{\cos(c+dx)}\,(13\sin(c+dx)-7\sin(3(c+dx))-28i\cos(c+dx)+4i\cos(3(c+dx)))-20F\right.}{66a^2d\cos^{\frac{7}{2}}(c+dx)(\tan(c+dx)-i)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cos[c + d*x])^(3/2)/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] ((e*Cos[c + d*x])^(3/2)*(-20*EllipticF[(c + d*x)/2, 2]*(Cos[2*(c + d*x)] +
I*Sin[2*(c + d*x)]) + Sqrt[Cos[c + d*x]]*((-28*I)*Cos[c + d*x] + (4*I)*Cos[
3*(c + d*x)] + 13*Sin[c + d*x] - 7*Sin[3*(c + d*x)])))/(66*a^2*d*Cos[c + d*
x]^(7/2)*(-I + Tan[c + d*x])^2)
```

fricas [F] time = 0.51, size = 0, normalized size = 0.00

$$\frac{\left(132\,a^2de^{(5i\,dx+5i\,c)}\mathrm{integral}\left(-\frac{10i\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\,ee^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{33\left(a^2de^{(2i\,dx+2i\,c)}+a^2d\right)},x\right)+\sqrt{\frac{1}{2}}\left(-11i\,ee^{(6i\,dx+6i\,c)}+41i\,ee^{(4i\,dx+4i\,c)}+15i\,ee\right.\right.}{132\,a^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/132*(132*a^2*d*e^(5*I*d*x + 5*I*c)*integral(-10/33*I*sqrt(1/2)*sqrt(e*e^(
2*I*d*x + 2*I*c) + e)*e*e^(-1/2*I*d*x - 1/2*I*c)/(a^2*d*e^(2*I*d*x + 2*I*c)
 + a^2*d), x) + sqrt(1/2)*(-11*I*e*e^(6*I*d*x + 6*I*c) + 41*I*e*e^(4*I*d*x
+ 4*I*c) + 15*I*e*e^(2*I*d*x + 2*I*c) + 3*I*e)*sqrt(e*e^(2*I*d*x + 2*I*c) +
 e)*e^(-1/2*I*d*x - 1/2*I*c))*e^(-5*I*d*x - 5*I*c)/(a^2*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cos(dx+c))^{\frac{3}{2}}}{(ia\tan(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
[Out] integrate((e*cos(d*x + c))^(3/2)/(I*a*tan(d*x + c) + a)^2, x)
```

maple [A] time = 6.10, size = 315, normalized size = 2.05

$$\frac{2e^2\left(384i\left(\sin^{13}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-384\left(\sin^{12}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-1152i\left(\sin^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+960\left(\sin^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\mathrm{co}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^2,x)
[Out] 2/33/a^2/sin(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1/2*c)^2*e+e)^(1/2)*e^2*(384*I*
sin(1/2*d*x+1/2*c)^13-384*sin(1/2*d*x+1/2*c)^12*cos(1/2*d*x+1/2*c)-1152*I*s
in(1/2*d*x+1/2*c)^11+960*sin(1/2*d*x+1/2*c)^10*cos(1/2*d*x+1/2*c)+1440*I*si
n(1/2*d*x+1/2*c)^9-1008*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8-960*I*sin(1
/2*d*x+1/2*c)^7+552*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6+360*I*sin(1/2*d
*x+1/2*c)^5-176*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-72*I*sin(1/2*d*x+1/
2*c)^3-5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Elli
pticF(cos(1/2*d*x+1/2*c),2^(1/2))+28*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c
)+6*I*sin(1/2*d*x+1/2*c))/d
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(e\,\cos(c+d\,x))^{3/2}}{(a+a\tan(c+d\,x)\,1\mathrm{i})^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^(3/2)/(a + a*tan(c + d*x)*1i)^2,x)
[Out] int((e*cos(c + d*x))^(3/2)/(a + a*tan(c + d*x)*1i)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**(3/2)/(a+I*a*tan(d*x+c))**2,x)
[Out] Timed out
```

3.666 $\int \frac{\sqrt{e\cos(c+dx)}}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=120

$$\frac{2i\sqrt{e\cos(c+dx)}}{9d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{2E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\cos(c+dx)}}{3a^2d\sqrt{\cos(c+dx)}}+\frac{2i\sqrt{e\cos(c+dx)}}{9d(a+ia\tan(c+dx))^2}$$

```
[Out] 2/3*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticE(sin(1/2*d*x+1
/2*c),2^(1/2))*(e*cos(d*x+c))^(1/2)/a^2/d/cos(d*x+c)^(1/2)+2/9*I*(e*cos(d*x
+c))^(1/2)/d/(a+I*a*tan(d*x+c))^2+2/9*I*(e*cos(d*x+c))^(1/2)/d/(a^2+I*a^2*t
an(d*x+c))
```

Rubi [A] time = 0.17, antiderivative size = 126, normalized size of antiderivative = 1.05, number of steps used = 5, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used = {3515, 3500, 3769, 3771, 2639}

$$\frac{4i\cos^2(c+dx)\sqrt{e\cos(c+dx)}}{9d\left(a^2+ia^2\tan(c+dx)\right)}+\frac{2\sin(c+dx)\cos(c+dx)\sqrt{e\cos(c+dx)}}{9a^2d}+\frac{2E\left(\frac{1}{2}(c+dx)\middle|2\right)\sqrt{e\cos(c+dx)}}{3a^2d\sqrt{\cos(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Cos[c + d*x]]/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (2*Sqrt[e*Cos[c + d*x]]*EllipticE[(c + d*x)/2, 2])/(3*a^2*d*Sqrt[Cos[c + d*
x]]) + (2*Cos[c + d*x]*Sqrt[e*Cos[c + d*x]]*Sin[c + d*x])/(9*a^2*d) + (((4*
I)/9)*Cos[c + d*x]^2*Sqrt[e*Cos[c + d*x]])/(d*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{\sqrt{e\cos(c+dx)}}{(a+ia\tan(c+dx))^2}\,dx = \left(\sqrt{e\cos(c+dx)}\sqrt{e\sec(c+dx)}\right)\int \frac{1}{\sqrt{e\sec(c+dx)}\,(a+ia\tan(c+dx))^2}\,dx$$

$$= \frac{4i\cos^2(c+dx)\sqrt{e\cos(c+dx)}}{9d\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(5e^2\sqrt{e\cos(c+dx)}\sqrt{e\sec(c+dx)}\right)\int \frac{1}{(e\sec(c+dx))^{5/2}}}{9a^2}$$

$$= \frac{2\cos(c+dx)\sqrt{e\cos(c+dx)}\,\sin(c+dx)}{9a^2d} + \frac{4i\cos^2(c+dx)\sqrt{e\cos(c+dx)}}{9d\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(\sqrt{e\,c\right.}}{}$$

$$= \frac{2\cos(c+dx)\sqrt{e\cos(c+dx)}\,\sin(c+dx)}{9a^2d} + \frac{4i\cos^2(c+dx)\sqrt{e\cos(c+dx)}}{9d\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\sqrt{e\cos}}{}$$

$$= \frac{2\sqrt{e\cos(c+dx)}\,E\left(\frac{1}{2}(c+dx)\middle|2\right)}{3a^2d\sqrt{\cos(c+dx)}} + \frac{2\cos(c+dx)\sqrt{e\cos(c+dx)}\,\sin(c+dx)}{9a^2d} + \frac{4i\,c}{9}$$

Mathematica [C] time = 1.72, size = 420, normalized size = 3.50

$$\frac{(\cos(dx)+i\sin(dx))^2\sqrt{e\cos(c+dx)}\left(\frac{2\sqrt{2}\,\csc(c)e^{-idx}(\cos(2c)+i\sin(2c))\left(e^{2idx}\sqrt{1+e^{2i(c+dx)}}\,{}_2F_1\left(\frac{1}{2},\frac{3}{4};\frac{7}{4};-e^{2i(c+dx)}\right)+3e^{2i(c+dx)}-3\sqrt{1-ie^{i(c+}}\right.}{}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Cos[c + d*x]]/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] (Sqrt[e*Cos[c + d*x]]*(Cos[d*x] + I*Sin[d*x])^2*((2*Sqrt[2]*Csc[c]*(3 + 3*E
^((2*I)*(c + d*x)) + 3*Sqrt[1 - I*E^(I*(c + d*x))]*Sqrt[E^(I*(c + d*x))*(-I
 + E^(I*(c + d*x)))]*EllipticE[ArcSin[Sqrt[(-I)*Cos[c + d*x] + Sin[c + d*x]
]], -1] - 3*Sqrt[1 - I*E^(I*(c + d*x))]*Sqrt[E^(I*(c + d*x))*(-I + E^(I*(c
+ d*x)))]*EllipticF[ArcSin[Sqrt[(-I)*Cos[c + d*x] + Sin[c + d*x]]], -1] + E
^((2*I)*d*x)*Sqrt[1 + E^((2*I)*(c + d*x))]*Hypergeometric2F1[1/2, 3/4, 7/4,
 -E^((2*I)*(c + d*x))])*(Cos[2*c] + I*Sin[2*c]))/(9*E^(I*d*x)*Sqrt[(1 + E^(
(2*I)*(c + d*x)))/E^(I*(c + d*x))]) - (Sqrt[Cos[c + d*x]]*Csc[c]*(Cos[2*d*x
] - I*Sin[2*d*x])*(7*Cos[c + 2*d*x] + 5*Cos[3*c + 2*d*x] - (4*I)*(Sin[c] -
2*Sin[c + 2*d*x] - Sin[3*c + 2*d*x])))/9))/(2*d*Cos[c + d*x]^(5/2)*(a + I*a
*Tan[c + d*x])^2)
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\frac{\sqrt{\frac{1}{2}}\sqrt{ee^{(2idx+2ic)}+e}\left(-9ie^{(5idx+5ic)}-15ie^{(4idx+4ic)}+4ie^{(3idx+3ic)}-4ie^{(2idx+2ic)}+ie^{(idx+ic)}-i\right)e^{\left(-\frac{1}{2}idx-\frac{1}{2}ic\right)}+18}{18\left(a^2de^{(5idx+5ic)}-a^2de^{(}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] 1/18*(sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*(-9*I*e^(5*I*d*x + 5*I*c) -
 15*I*e^(4*I*d*x + 4*I*c) + 4*I*e^(3*I*d*x + 3*I*c) - 4*I*e^(2*I*d*x + 2*I*
```

```
c) + I*e^(I*d*x + I*c) - I)*e^(-1/2*I*d*x - 1/2*I*c) + 18*(a^2*d*e^(5*I*d*x
 + 5*I*c) - a^2*d*e^(4*I*d*x + 4*I*c))*integral(1/3*sqrt(1/2)*sqrt(e*e^(2*I
*d*x + 2*I*c) + e)*(-2*I*e^(2*I*d*x + 2*I*c) - 4*I*e^(I*d*x + I*c) - 2*I)*e
^(-1/2*I*d*x - 1/2*I*c)/(a^2*d*e^(4*I*d*x + 4*I*c) - 2*a^2*d*e^(3*I*d*x + 3
*I*c) + 2*a^2*d*e^(2*I*d*x + 2*I*c) - 2*a^2*d*e^(I*d*x + I*c) + a^2*d), x))
/(a^2*d*e^(5*I*d*x + 5*I*c) - a^2*d*e^(4*I*d*x + 4*I*c))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e \cos(dx+c)}}{(i a \tan(dx+c)+a)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate(sqrt(e*cos(d*x + c))/(I*a*tan(d*x + c) + a)^2, x)
```

maple [B] time = 5.95, size = 277, normalized size = 2.31

$$-\frac{2e\left(64i\left(\sin^{11}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-64\left(\sin^{10}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)-160i\left(\sin^{9}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+128\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^{8}\left(\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] -2/9/a^2/sin(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1/2*c)^2*e+e)^(1/2)*e*(64*I*sin
(1/2*d*x+1/2*c)^11-64*sin(1/2*d*x+1/2*c)^10*cos(1/2*d*x+1/2*c)-160*I*sin(1/
2*d*x+1/2*c)^9+128*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8+160*I*sin(1/2*d*
x+1/2*c)^7-104*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6-80*I*sin(1/2*d*x+1/2
*c)^5+40*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+20*I*sin(1/2*d*x+1/2*c)^3-
3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(c
os(1/2*d*x+1/2*c),2^(1/2))-6*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-2*I*si
n(1/2*d*x+1/2*c))/d
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{e\,\cos(c+d\,x)}}{{(a+a\,\tan(c+d\,x)\,1{}\mathrm{i})}^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^(1/2)/(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] int((e*cos(c + d*x))^(1/2)/(a + a*tan(c + d*x)*1i)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{\sqrt{e \cos(c+dx)}}{\tan^2(c+dx)-2i\tan(c+dx)-1}\, dx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**(1/2)/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -Integral(sqrt(e*cos(c + d*x))/(tan(c + d*x)**2 - 2*I*tan(c + d*x) - 1), x)
/a**2
```

3.667 $\int \frac{1}{\sqrt{e\cos(c+dx)}\,(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=120

$$\frac{2i}{7d\left(a^2+ia^2\tan(c+dx)\right)\sqrt{e\cos(c+dx)}}+\frac{2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)}{7a^2d\sqrt{e\cos(c+dx)}}+\frac{2i}{7d(a+ia\tan(c+dx))^2\sqrt{e\cos(c+dx)}}$$

```
[Out] 2/7*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*EllipticF(sin(1/2*d*x+1
/2*c),2^(1/2))*cos(d*x+c)^(1/2)/a^2/d/(e*cos(d*x+c))^(1/2)+2/7*I/d/(e*cos(d
*x+c))^(1/2)/(a+I*a*tan(d*x+c))^2+2/7*I/d/(e*cos(d*x+c))^(1/2)/(a^2+I*a^2*t
an(d*x+c))
```

Rubi [A] time = 0.16, antiderivative size = 126, normalized size of antiderivative = 1.05, number of steps used = 5, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {3515, 3500, 3769, 3771, 2641}

$$\frac{4i\cos^2(c+dx)}{7d\left(a^2+ia^2\tan(c+dx)\right)\sqrt{e\cos(c+dx)}}+\frac{2\sin(c+dx)\cos(c+dx)}{7a^2d\sqrt{e\cos(c+dx)}}+\frac{2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)}{7a^2d\sqrt{e\cos(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[e*Cos[c + d*x]]*(a + I*a*Tan[c + d*x])^2),x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*EllipticF[(c + d*x)/2, 2])/(7*a^2*d*Sqrt[e*Cos[c + d*
x]]) + (2*Cos[c + d*x]*Sin[c + d*x])/(7*a^2*d*Sqrt[e*Cos[c + d*x]]) + (((4*
I)/7)*Cos[c + d*x]^2)/(d*Sqrt[e*Cos[c + d*x]]*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3769

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Csc[c + d*x])^(n + 1))/(b*d*n), x] + Dist[(n + 1)/(b^2*n), Int[(b*Csc[c +
 d*x])^(n + 2), x], x] /; FreeQ[{b, c, d}, x] && LtQ[n, -1] && IntegerQ[2*n
]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{1}{\sqrt{e\cos(c+dx)}\,(a+ia\tan(c+dx))^2}\,dx = \frac{\int \frac{\sqrt{e\sec(c+dx)}}{(a+ia\tan(c+dx))^2}\,dx}{\sqrt{e\cos(c+dx)}\,\sqrt{e\sec(c+dx)}}$$

$$= \frac{4i\cos^2(c+dx)}{7d\sqrt{e\cos(c+dx)}\,\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(3e^2\right)\int \frac{1}{(e\sec(c+dx))^{3/2}}$$

$$= \frac{2\cos(c+dx)\sin(c+dx)}{7a^2d\sqrt{e\cos(c+dx)}} + \frac{4i\cos^2(c+dx)}{7d\sqrt{e\cos(c+dx)}\,\left(a^2+ia^2\tan(c+dx)\right)}$$

$$= \frac{2\cos(c+dx)\sin(c+dx)}{7a^2d\sqrt{e\cos(c+dx)}} + \frac{4i\cos^2(c+dx)}{7d\sqrt{e\cos(c+dx)}\,\left(a^2+ia^2\tan(c+dx)\right)}$$

$$= \frac{2\sqrt{\cos(c+dx)}\,F\left(\frac{1}{2}(c+dx)\middle|2\right)}{7a^2d\sqrt{e\cos(c+dx)}} + \frac{2\cos(c+dx)\sin(c+dx)}{7a^2d\sqrt{e\cos(c+dx)}} + \frac{}{7d\sqrt{e}$$

Mathematica [A] time = 0.61, size = 158, normalized size = 1.32

$$\frac{\left(\sin\left(\frac{1}{2}(c+dx)\right)-i\cos\left(\frac{1}{2}(c+dx)\right)\right)\left(\sqrt{\cos(c+dx)}\,\left(4i\sin^3\left(\frac{1}{2}(c+dx)\right)+3\cos\left(\frac{1}{2}(c+dx)\right)+\cos\left(\frac{3}{2}(c+dx)\right)\right)+}{7a^2d\cos^{\frac{3}{2}}(c+dx)(\tan(c+dx)-i)^2\sqrt{e\cos(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[e*Cos[c + d*x]]*(a + I*a*Tan[c + d*x])^2),x]
```

```
[Out] (((-I)*Cos[(c + d*x)/2] + Sin[(c + d*x)/2])*(Sqrt[Cos[c + d*x]]*(3*Cos[(c +
 d*x)/2] + Cos[(3*(c + d*x))/2] + (4*I)*Sin[(c + d*x)/2]^3) + 2*EllipticF[(
c + d*x)/2, 2]*((-I)*Cos[(3*(c + d*x))/2] + Sin[(3*(c + d*x))/2])))/(7*a^2*
d*Cos[c + d*x]^(3/2)*Sqrt[e*Cos[c + d*x]]*(-I + Tan[c + d*x])^2)
```

fricas [F] time = 0.54, size = 0, normalized size = 0.00

$$\frac{\left(7\,a^2dee^{(3i\,dx+3i\,c)}\text{integral}\left(-\frac{2i\sqrt{\frac{1}{2}}\,\sqrt{ee^{(2i\,dx+2i\,c)}+e}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{7\left(a^2dee^{(2i\,dx+2i\,c)}+a^2de\right)},x\right)+\sqrt{\frac{1}{2}}\,\sqrt{ee^{(2i\,dx+2i\,c)}+e}\,\left(3i\,e^{(2i\,dx+2i\,c)}+i\right)e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}\right)e}{7\,a^2de}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas"
)
```

```
[Out] 1/7*(7*a^2*d*e*e^(3*I*d*x + 3*I*c)*integral(-2/7*I*sqrt(1/2)*sqrt(e*e^(2*I*
d*x + 2*I*c) + e)*e^(-1/2*I*d*x - 1/2*I*c)/(a^2*d*e*e^(2*I*d*x + 2*I*c) + a
^2*d*e), x) + sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*(3*I*e^(2*I*d*x + 2
*I*c) + I)*e^(-1/2*I*d*x - 1/2*I*c))*e^(-3*I*d*x - 3*I*c)/(a^2*d*e)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{e\cos(dx+c)}\,(i\,a\tan(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(e*cos(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")

[Out] integrate(1/(sqrt(e*cos(d*x + c))*(I*a*tan(d*x + c) + a)^2), x)

maple [A] time = 6.02, size = 240, normalized size = 2.00

$$\frac{\frac{64i\left(\sin^9\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\frac{64\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^8\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-\frac{128i\left(\sin^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+\frac{96\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}+\frac{96i\left(\sin^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{7}-8\left(\sin^4\left(\frac{dx}{2}\right.\right.}{a^2\sin\left(\frac{dx}{2}+\frac{c}{2}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(e*cos(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^2,x)

[Out] 2/7/a^2/sin(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1/2*c)^2*e+e)^(1/2)*(32*I*sin(1/2*d*x+1/2*c)^9-32*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^8-64*I*sin(1/2*d*x+1/2*c)^7+48*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6+48*I*sin(1/2*d*x+1/2*c)^5-28*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-16*I*sin(1/2*d*x+1/2*c)^3-(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))+6*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)+2*I*sin(1/2*d*x+1/2*c))/d

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(e*cos(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")

[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is undefined.

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\sqrt{e\cos\left(c+d\,x\right)}\,{\left(a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/((e*cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^2),x)

[Out] int(1/((e*cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^2), x)

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{1}{\sqrt{e\cos\left(c+dx\right)}\tan^2\left(c+dx\right)-2i\sqrt{e\cos\left(c+dx\right)}\tan\left(c+dx\right)-\sqrt{e\cos\left(c+dx\right)}}\,dx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(e*cos(d*x+c))**(1/2)/(a+I*a*tan(d*x+c))**2,x)

[Out] -Integral(1/(sqrt(e*cos(c + d*x))*tan(c + d*x)**2 - 2*I*sqrt(e*cos(c + d*x))*tan(c + d*x) - sqrt(e*cos(c + d*x))), x)/a**2

3.668 $\int \frac{1}{(e\cos(c+dx))^{3/2}(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=92

$$\frac{2\cos^{\frac{3}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^2d(e\cos(c+dx))^{3/2}}+\frac{4i\cos^2(c+dx)}{5d\left(a^2+ia^2\tan(c+dx)\right)(e\cos(c+dx))^{3/2}}$$

```
[Out] 2/5*cos(d*x+c)^(3/2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellipt
icE(sin(1/2*d*x+1/2*c),2^(1/2))/a^2/d/(e*cos(d*x+c))^(3/2)+4/5*I*cos(d*x+c)
^2/d/(e*cos(d*x+c))^(3/2)/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.15, antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {3515, 3500, 3771, 2639}

$$\frac{2\cos^{\frac{3}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^2d(e\cos(c+dx))^{3/2}}+\frac{4i\cos^2(c+dx)}{5d\left(a^2+ia^2\tan(c+dx)\right)(e\cos(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Cos[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^2),x]
```

```
[Out] (2*Cos[c + d*x]^(3/2)*EllipticE[(c + d*x)/2, 2])/(5*a^2*d*(e*Cos[c + d*x])^
(3/2)) + (((4*I)/5)*Cos[c + d*x]^2)/(d*(e*Cos[c + d*x])^(3/2)*(a^2 + I*a^2*
Tan[c + d*x]))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{1}{(e\cos(c+dx))^{3/2}(a+ia\tan(c+dx))^2}dx = \frac{\int \frac{(e\sec(c+dx))^{3/2}}{(a+ia\tan(c+dx))^2}dx}{(e\cos(c+dx))^{3/2}(e\sec(c+dx))^{3/2}}$$
$$= \frac{4i\cos^2(c+dx)}{5d(e\cos(c+dx))^{3/2}\left(a^2+ia^2\tan(c+dx)\right)} + \frac{e^2\int \frac{}{\sqrt{e\,\mathrm{se}}}}{5a^2(e\cos(c+dx))}$$
$$= \frac{4i\cos^2(c+dx)}{5d(e\cos(c+dx))^{3/2}\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\cos^{\frac{3}{2}}(c+dx)\int \sqrt{c}}{5a^2(e\cos(c}$$
$$= \frac{2\cos^{\frac{3}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^2d(e\cos(c+dx))^{3/2}} + \frac{4i\cos^2(c+dx)}{5d(e\cos(c+dx))^{3/2}\left(a^2+ia^2\right.}$$

Mathematica [B] time = 0.69, size = 244, normalized size = 2.65

$$(\sin(c+dx)+i\cos(c+dx))\left(i\sin(2(c+dx))+3\cos(2(c+dx))-2\sqrt{\sin(c+dx)-i\cos(c+dx)+1}\sqrt{\sin(c+}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Cos[c + d*x])^(3/2)*(a + I*a*Tan[c + d*x])^2),x]
```

```
[Out] ((I*Cos[c + d*x] + Sin[c + d*x])*(3 + 3*Cos[2*(c + d*x)] + 2*EllipticE[ArcS
in[Sqrt[(-I)*Cos[c + d*x] + Sin[c + d*x]]], -1]*Sqrt[1 - I*Cos[c + d*x] + S
in[c + d*x]]*Sqrt[(-I)*Cos[c + d*x] + Cos[2*(c + d*x)] + Sin[c + d*x] + I*S
in[2*(c + d*x)]] - 2*EllipticF[ArcSin[Sqrt[(-I)*Cos[c + d*x] + Sin[c + d*x]
]], -1]*Sqrt[1 - I*Cos[c + d*x] + Sin[c + d*x]]*Sqrt[(-I)*Cos[c + d*x] + Co
s[2*(c + d*x)] + Sin[c + d*x] + I*Sin[2*(c + d*x)]] + I*Sin[2*(c + d*x)]))/
(5*a^2*d*e*Sqrt[e*Cos[c + d*x]])
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\frac{\left(5\,a^2de^2e^{(2i\,dx+2i\,c)}\mathrm{integral}\left(-\frac{2i\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\,e^{\left(\frac{1}{2}i\,dx+\frac{1}{2}i\,c\right)}}{5\left(a^2de^2e^{(2i\,dx+2i\,c)}+a^2de^2\right)},x\right)+\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\left(4i\,e^{(2i\,dx+2i\,c)}+2i\right)e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}\right.}}{5\,a^2de^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas"
)
```

```
[Out] 1/5*(5*a^2*d*e^2*e^(2*I*d*x + 2*I*c)*integral(-2/5*I*sqrt(1/2)*sqrt(e*e^(2*
I*d*x + 2*I*c) + e)*e^(1/2*I*d*x + 1/2*I*c)/(a^2*d*e^2*e^(2*I*d*x + 2*I*c)
+ a^2*d*e^2), x) + sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*(4*I*e^(2*I*d*
x + 2*I*c) + 2*I)*e^(-1/2*I*d*x - 1/2*I*c))*e^(-2*I*d*x - 2*I*c)/(a^2*d*e^2
)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\cos(dx+c))^{\frac{3}{2}}(i\,a\tan(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

[Out] integrate(1/((e*cos(d*x + c))^(3/2)*(I*a*tan(d*x + c) + a)^2), x)

maple [A] time = 5.72, size = 207, normalized size = 2.25

$$-\frac{2\left(16i\left(\sin^7\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-16\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-24i\left(\sin^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+16\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}{5e\,a^2\,\mathrm{s}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(e*cos(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^2,x)

[Out] -2/5/e/a^2/sin(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1/2*c)^2*e+e)^(1/2)*(16*I*sin(1/2*d*x+1/2*c)^7-16*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6-24*I*sin(1/2*d*x+1/2*c)^5+16*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)+12*I*sin(1/2*d*x+1/2*c)^3-(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))-4*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c)-2*I*sin(1/2*d*x+1/2*c))/d

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(e*cos(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")

[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is undefined.

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(e\,\cos\left(c+d\,x\right)\right)}^{3/2}\,{\left(a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/((e*cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^2),x)

[Out] int(1/((e*cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^2), x)

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(e*cos(d*x+c))**(3/2)/(a+I*a*tan(d*x+c))**2,x)

[Out] Timed out

3.669 $\int \frac{1}{(e\cos(c+dx))^{5/2}(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=92

$$-\frac{2\cos^{\frac{5}{2}}(c+dx)F\left(\frac{1}{2}(c+dx)\middle|2\right)}{3a^2d(e\cos(c+dx))^{5/2}}+\frac{4i\cos^2(c+dx)}{3d\left(a^2+ia^2\tan(c+dx)\right)(e\cos(c+dx))^{5/2}}$$

```
[Out] -2/3*cos(d*x+c)^(5/2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellip
ticF(sin(1/2*d*x+1/2*c),2^(1/2))/a^2/d/(e*cos(d*x+c))^(5/2)+4/3*I*cos(d*x+c
)^2/d/(e*cos(d*x+c))^(5/2)/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.15, antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.143$, Rules used = {3515, 3500, 3771, 2641}

$$-\frac{2\cos^{\frac{5}{2}}(c+dx)F\left(\frac{1}{2}(c+dx)\middle|2\right)}{3a^2d(e\cos(c+dx))^{5/2}}+\frac{4i\cos^2(c+dx)}{3d\left(a^2+ia^2\tan(c+dx)\right)(e\cos(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Cos[c + d*x])^(5/2)*(a + I*a*Tan[c + d*x])^2),x]
```

```
[Out] (-2*Cos[c + d*x]^(5/2)*EllipticF[(c + d*x)/2, 2])/(3*a^2*d*(e*Cos[c + d*x])
^(5/2)) + (((4*I)/3)*Cos[c + d*x]^2)/(d*(e*Cos[c + d*x])^(5/2)*(a^2 + I*a^2
*Tan[c + d*x]))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{1}{(e\cos(c+dx))^{5/2}(a+ia\tan(c+dx))^2}dx = \frac{\int \frac{(e\sec(c+dx))^{5/2}}{(a+ia\tan(c+dx))^2}dx}{(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}}$$
$$= \frac{4i\cos^2(c+dx)}{3d(e\cos(c+dx))^{5/2}\left(a^2+ia^2\tan(c+dx)\right)} - \frac{e^2\int \sqrt{e\sec(c}}{3a^2(e\cos(c+dx))^{5/2}(}$$
$$= \frac{4i\cos^2(c+dx)}{3d(e\cos(c+dx))^{5/2}\left(a^2+ia^2\tan(c+dx)\right)} - \frac{\cos^{\frac{5}{2}}(c+dx)\int \frac{1}{\sqrt{\cos(c}}}{3a^2(e\cos(c+dx)}$$
$$= -\frac{2\cos^{\frac{5}{2}}(c+dx)F\left(\frac{1}{2}(c+dx)\middle|2\right)}{3a^2d(e\cos(c+dx))^{5/2}} + \frac{4i\cos^2(c+dx)}{3d(e\cos(c+dx))^{5/2}\left(a^2+ia^2\text{ta}\right.}$$

Mathematica [A] time = 0.39, size = 116, normalized size = 1.26

$$\frac{2\sqrt{\cos(c+dx)}(\cos(dx)+i\sin(dx))^2\left(2\sqrt{\cos(c+dx)}(\sin(c-dx)-i\cos(c-dx))+(\cos(2c)+i\sin(2c))F\left(\frac{1}{2}(c+\right.\right.}{3a^2d(\tan(c+dx)-i)^2(e\cos(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Cos[c + d*x])^(5/2)*(a + I*a*Tan[c + d*x])^2),x]
```

```
[Out] (2*Sqrt[Cos[c + d*x]]*(Cos[d*x] + I*Sin[d*x])^2*(EllipticF[(c + d*x)/2, 2]*
(Cos[2*c] + I*Sin[2*c]) + 2*Sqrt[Cos[c + d*x]]*((-I)*Cos[c - d*x] + Sin[c -
 d*x])))/(3*a^2*d*(e*Cos[c + d*x])^(5/2)*(-I + Tan[c + d*x])^2)
```

fricas [F] time = 0.52, size = 0, normalized size = 0.00

$$\frac{\left(3\,a^2de^3e^{(i\,dx+i\,c)}\text{integral}\left(\frac{2i\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{3\left(a^2de^3e^{(2i\,dx+2i\,c)}+a^2de^3\right)},x\right)+4i\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}\right)e^{(-i\,dx-i\,c)}}{3\,a^2de^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas"
)
```

```
[Out] 1/3*(3*a^2*d*e^3*e^(I*d*x + I*c)*integral(2/3*I*sqrt(1/2)*sqrt(e*e^(2*I*d*x
 + 2*I*c) + e)*e^(-1/2*I*d*x - 1/2*I*c)/(a^2*d*e^3*e^(2*I*d*x + 2*I*c) + a^
2*d*e^3), x) + 4*I*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*e^(-1/2*I*d*x
- 1/2*I*c))*e^(-I*d*x - I*c)/(a^2*d*e^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\cos(dx+c))^{\frac{5}{2}}(i\,a\tan(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((e*cos(d*x + c))^(5/2)*(I*a*tan(d*x + c) + a)^2), x)
```

maple [A] time = 5.38, size = 170, normalized size = 1.85

$$\frac{\frac{16i\left(\sin^5\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3} - \frac{16\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cos\left(\frac{dx}{2}+\frac{c}{2}\right)}{3} - \frac{16i\left(\sin^3\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{3} + \frac{2\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\ \text{EllipticF}\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)}{3} + \frac{8(\text{si}}{}}{e^2a^2\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)e+e}\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cos(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 2/3/e^2/a^2/sin(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1/2*c)^2*e+e)^(1/2)*(8*I*sin
(1/2*d*x+1/2*c)^5-8*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1/2*c)-8*I*sin(1/2*d*x
+1/2*c)^3+(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*Ell
ipticF(cos(1/2*d*x+1/2*c),2^(1/2))+4*sin(1/2*d*x+1/2*c)^2*cos(1/2*d*x+1/2*c
)+2*I*sin(1/2*d*x+1/2*c))/d
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\left(e\,\cos\left(c+d\,x\right)\right)}^{5/2}\,{\left(a+a\,\mathrm{tan}\left(c+d\,x\right)\,1{}\mathrm{i}\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cos(c + d*x))^(5/2)*(a + a*tan(c + d*x)*1i)^2),x)
```

```
[Out] int(1/((e*cos(c + d*x))^(5/2)*(a + a*tan(c + d*x)*1i)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))**(5/2)/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Timed out
```

3.670 $\int \frac{1}{(e\cos(c+dx))^{7/2}(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=122

$$\frac{6\cos^{\frac{7}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d(e\cos(c+dx))^{7/2}}-\frac{6\sin(c+dx)\cos^3(c+dx)}{a^2d(e\cos(c+dx))^{7/2}}+\frac{4i\cos^2(c+dx)}{d\left(a^2+ia^2\tan(c+dx)\right)(e\cos(c+dx))^{7/2}}$$

```
[Out] 6*cos(d*x+c)^(7/2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Elliptic
E(sin(1/2*d*x+1/2*c),2^(1/2))/a^2/d/(e*cos(d*x+c))^(7/2)-6*cos(d*x+c)^3*sin
(d*x+c)/a^2/d/(e*cos(d*x+c))^(7/2)+4*I*cos(d*x+c)^2/d/(e*cos(d*x+c))^(7/2)/
(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.17, antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {3515, 3500, 3768, 3771, 2639}

$$-\frac{6\sin(c+dx)\cos^3(c+dx)}{a^2d(e\cos(c+dx))^{7/2}}+\frac{4i\cos^2(c+dx)}{d\left(a^2+ia^2\tan(c+dx)\right)(e\cos(c+dx))^{7/2}}+\frac{6\cos^{\frac{7}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d(e\cos(c+dx))^{7/2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Cos[c + d*x])^(7/2)*(a + I*a*Tan[c + d*x])^2),x]
```

```
[Out] (6*Cos[c + d*x]^(7/2)*EllipticE[(c + d*x)/2, 2])/(a^2*d*(e*Cos[c + d*x])^(7
/2)) - (6*Cos[c + d*x]^3*Sin[c + d*x])/(a^2*d*(e*Cos[c + d*x])^(7/2)) + ((4
*I)*Cos[c + d*x]^2)/(d*(e*Cos[c + d*x])^(7/2)*(a^2 + I*a^2*Tan[c + d*x]))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{1}{(e\cos(c+dx))^{7/2}(a+ia\tan(c+dx))^2}\,dx = \frac{\int \frac{(e\sec(c+dx))^{7/2}}{(a+ia\tan(c+dx))^2}\,dx}{(e\cos(c+dx))^{7/2}(e\sec(c+dx))^{7/2}}$$

$$= \frac{4i\cos^2(c+dx)}{d(e\cos(c+dx))^{7/2}\left(a^2+ia^2\tan(c+dx)\right)} - \frac{\left(3e^2\right)\int(e\sec(c}{a^2(e\cos(c+dx))^{7/2}}$$

$$= -\frac{6\cos^3(c+dx)\sin(c+dx)}{a^2d(e\cos(c+dx))^{7/2}} + \frac{4i\cos^2(c+dx)}{d(e\cos(c+dx))^{7/2}\left(a^2+ia^2\tan(\right.}$$

$$= -\frac{6\cos^3(c+dx)\sin(c+dx)}{a^2d(e\cos(c+dx))^{7/2}} + \frac{4i\cos^2(c+dx)}{d(e\cos(c+dx))^{7/2}\left(a^2+ia^2\tan(\right.}$$

$$= \frac{6\cos^{\frac{7}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{a^2d(e\cos(c+dx))^{7/2}} - \frac{6\cos^3(c+dx)\sin(c+dx)}{a^2d(e\cos(c+dx))^{7/2}} +$$

Mathematica [B] time = 0.95, size = 255, normalized size = 2.09

$$-2\sin(c+dx)+10i\cos(c+dx)-6i(\cos(c+dx)-i\sin(c+dx))\sqrt{\sin(c+dx)-i\cos(c+dx)+1}\,\sqrt{\sin(c+dx}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Cos[c + d*x])^(7/2)*(a + I*a*Tan[c + d*x])^2),x]
```

```
[Out] ((10*I)*Cos[c + d*x] - 2*Sin[c + d*x] - (6*I)*EllipticF[ArcSin[Sqrt[(-I)*Co
s[c + d*x] + Sin[c + d*x]]], -1]*(Cos[c + d*x] - I*Sin[c + d*x])*Sqrt[1 - I
*Cos[c + d*x] + Sin[c + d*x]]*Sqrt[(-I)*Cos[c + d*x] + Cos[2*(c + d*x)] + S
in[c + d*x] + I*Sin[2*(c + d*x)]] + 6*EllipticE[ArcSin[Sqrt[(-I)*Cos[c + d*
x] + Sin[c + d*x]]], -1]*Sqrt[1 - I*Cos[c + d*x] + Sin[c + d*x]]*(I*Cos[c +
 d*x] + Sin[c + d*x])*Sqrt[(-I)*Cos[c + d*x] + Cos[2*(c + d*x)] + Sin[c + d
*x] + I*Sin[2*(c + d*x)]])/(a^2*d*e^3*Sqrt[e*Cos[c + d*x]])
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\frac{\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\left(12i\,e^{(2i\,dx+2i\,c)}+8i\right)e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}+\left(a^2de^4e^{(2i\,dx+2i\,c)}+a^2de^4\right)\text{integral}\left(-\frac{6i\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\,e^{(}}{a^2de^4e^{(2i\,dx+2i\,c)}+a}\right.}{a^2de^4e^{(2i\,dx+2i\,c)}+a^2de^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas"
)
```

```
[Out] (sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*(12*I*e^(2*I*d*x + 2*I*c) + 8*I)
*e^(-1/2*I*d*x - 1/2*I*c) + (a^2*d*e^4*e^(2*I*d*x + 2*I*c) + a^2*d*e^4)*int
egral(-6*I*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*e^(1/2*I*d*x + 1/2*I*c
)/(a^2*d*e^4*e^(2*I*d*x + 2*I*c) + a^2*d*e^4), x))/(a^2*d*e^4*e^(2*I*d*x +
2*I*c) + a^2*d*e^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(e\cos\left(dx+c\right)\right)^{\frac{7}{2}}\left(i\,a\tan\left(dx+c\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((e*cos(d*x + c))^(7/2)*(I*a*tan(d*x + c) + a)^2), x)
```

maple [A] time = 4.53, size = 135, normalized size = 1.11

$$-\frac{2\left(4i\left(\sin^{3}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-3\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\sqrt{2\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\ \mathrm{EllipticE}\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)+2\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)\cdots\right)}{e^{3}a^{2}\sin\left(\frac{dx}{2}+\frac{c}{2}\right)\sqrt{-2\left(\sin^{2}\left(\frac{dx}{2}+\frac{c}{2}\right)\right)e+e}\ d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cos(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] -2/e^3/a^2/sin(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1/2*c)^2*e+e)^(1/2)*(4*I*sin(
1/2*d*x+1/2*c)^3-3*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2-1)^
(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+2*sin(1/2*d*x+1/2*c)^2*cos(1/2*
d*x+1/2*c)-2*I*sin(1/2*d*x+1/2*c))/d
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\left(e\,\cos\left(c+d\,x\right)\right)^{7/2}\,\left(a+a\,\tan\left(c+d\,x\right)\,1{}\mathrm{i}\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cos(c + d*x))^(7/2)*(a + a*tan(c + d*x)*1i)^2),x)
```

```
[Out] int(1/((e*cos(c + d*x))^(7/2)*(a + a*tan(c + d*x)*1i)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))**(7/2)/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Timed out
```

3.671 $\int \frac{1}{(e\cos(c+dx))^{9/2}(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=126

$$\frac{10\cos^{\frac{9}{2}}(c+dx)F\left(\frac{1}{2}(c+dx)\middle|2\right)}{3a^2d(e\cos(c+dx))^{9/2}}+\frac{10\sin(c+dx)\cos^3(c+dx)}{3a^2d(e\cos(c+dx))^{9/2}}-\frac{4i\cos^2(c+dx)}{d\left(a^2+ia^2\tan(c+dx)\right)(e\cos(c+dx))^{9/2}}$$

```
[Out] 10/3*cos(d*x+c)^(9/2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ellip
ticF(sin(1/2*d*x+1/2*c),2^(1/2))/a^2/d/(e*cos(d*x+c))^(9/2)+10/3*cos(d*x+c)
^3*sin(d*x+c)/a^2/d/(e*cos(d*x+c))^(9/2)-4*I*cos(d*x+c)^2/d/(e*cos(d*x+c))^
(9/2)/(a^2+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.17, antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {3515, 3500, 3768, 3771, 2641}

$$\frac{10\sin(c+dx)\cos^3(c+dx)}{3a^2d(e\cos(c+dx))^{9/2}}-\frac{4i\cos^2(c+dx)}{d\left(a^2+ia^2\tan(c+dx)\right)(e\cos(c+dx))^{9/2}}+\frac{10\cos^{\frac{9}{2}}(c+dx)F\left(\frac{1}{2}(c+dx)\middle|2\right)}{3a^2d(e\cos(c+dx))^{9/2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Cos[c + d*x])^(9/2)*(a + I*a*Tan[c + d*x])^2),x]
```

```
[Out] (10*Cos[c + d*x]^(9/2)*EllipticF[(c + d*x)/2, 2])/(3*a^2*d*(e*Cos[c + d*x])
^(9/2)) + (10*Cos[c + d*x]^3*Sin[c + d*x])/(3*a^2*d*(e*Cos[c + d*x])^(9/2))
 - ((4*I)*Cos[c + d*x]^2)/(d*(e*Cos[c + d*x])^(9/2)*(a^2 + I*a^2*Tan[c + d*
x]))
```

Rule 2641

```
Int[1/Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticF[(1*(c -
 Pi/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{1}{(e\cos(c+dx))^{9/2}(a+ia\tan(c+dx))^2}\,dx = \frac{\int \frac{(e\sec(c+dx))^{9/2}}{(a+ia\tan(c+dx))^2}\,dx}{(e\cos(c+dx))^{9/2}(e\sec(c+dx))^{9/2}}$$

$$= -\frac{4i\cos^2(c+dx)}{d(e\cos(c+dx))^{9/2}\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(5e^2\right)\int(e\sec(c+}{a^2(e\cos(c+dx))^{9/2}(e}$$

$$= \frac{10\cos^3(c+dx)\sin(c+dx)}{3a^2d(e\cos(c+dx))^{9/2}} - \frac{4i\cos^2(c+dx)}{d(e\cos(c+dx))^{9/2}\left(a^2+ia^2\tan(c+\right.}$$

$$= \frac{10\cos^3(c+dx)\sin(c+dx)}{3a^2d(e\cos(c+dx))^{9/2}} - \frac{4i\cos^2(c+dx)}{d(e\cos(c+dx))^{9/2}\left(a^2+ia^2\tan(c+\right.}$$

$$= \frac{10\cos^{\frac{9}{2}}(c+dx)F\left(\frac{1}{2}(c+dx)\middle|2\right)}{3a^2d(e\cos(c+dx))^{9/2}} + \frac{10\cos^3(c+dx)\sin(c+dx)}{3a^2d(e\cos(c+dx))^{9/2}} - \frac{}{d}$$

Mathematica [A] time = 0.37, size = 67, normalized size = 0.53

$$\frac{2\left(-\sin(c+dx)-6i\cos(c+dx)+5\cos^{\frac{3}{2}}(c+dx)F\left(\frac{1}{2}(c+dx)\middle|2\right)\right)}{3a^2de^3(e\cos(c+dx))^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Cos[c + d*x])^(9/2)*(a + I*a*Tan[c + d*x])^2),x]
```

```
[Out] (2*((-6*I)*Cos[c + d*x] + 5*Cos[c + d*x]^(3/2)*EllipticF[(c + d*x)/2, 2] -
Sin[c + d*x]))/(3*a^2*d*e^3*(e*Cos[c + d*x])^(3/2))
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\frac{\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\left(-20i\,e^{(3i\,dx+3i\,c)}-28i\,e^{(i\,dx+i\,c)}\right)e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}+3\left(a^2de^5e^{(4i\,dx+4i\,c)}+2\,a^2de^5e^{(2i\,dx+2i\,c)}+a^2de^5\right)\text{in}}{3\left(a^2de^5e^{(4i\,dx+4i\,c)}+2\,a^2de^5e^{(2i\,dx+2i\,c)}+a^2de^5\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(9/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas"
)
```

```
[Out] 1/3*(sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*(-20*I*e^(3*I*d*x + 3*I*c) -
 28*I*e^(I*d*x + I*c))*e^(-1/2*I*d*x - 1/2*I*c) + 3*(a^2*d*e^5*e^(4*I*d*x +
 4*I*c) + 2*a^2*d*e^5*e^(2*I*d*x + 2*I*c) + a^2*d*e^5)*integral(-10/3*I*sqr
t(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*e^(-1/2*I*d*x - 1/2*I*c)/(a^2*d*e^5*
e^(2*I*d*x + 2*I*c) + a^2*d*e^5), x))/(a^2*d*e^5*e^(4*I*d*x + 4*I*c) + 2*a^
2*d*e^5*e^(2*I*d*x + 2*I*c) + a^2*d*e^5)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\cos(dx+c))^{\frac{9}{2}}\,(i\,a\tan(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(9/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((e*cos(d*x + c))^(9/2)*(I*a*tan(d*x + c) + a)^2), x)
```

maple [A] time = 7.14, size = 208, normalized size = 1.65

$$-\frac{2\left(10\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\ \mathrm{EllipticF}\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)+12i\left(\sin^3\left(\frac{dx}{2}+\right.\right.\right.}{3\left(2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cos(d*x+c))^(9/2)/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] -2/3/(2*sin(1/2*d*x+1/2*c)^2-1)/a^2/sin(1/2*d*x+1/2*c)/(-2*sin(1/2*d*x+1/2*
c)^2*e+e)^(1/2)/e^4*(10*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c
)^2)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))*sin(1/2*d*x+1/2*c)^2+12*I*
sin(1/2*d*x+1/2*c)^3-5*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*d*x+1/2*c)^2
-1)^(1/2)*EllipticF(cos(1/2*d*x+1/2*c),2^(1/2))-2*sin(1/2*d*x+1/2*c)^2*cos(
1/2*d*x+1/2*c)-6*I*sin(1/2*d*x+1/2*c))/d
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(9/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{(e\,\cos(c+d\,x))^{9/2}\,(a+a\tan(c+d\,x)\,1\mathrm{i})^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cos(c + d*x))^(9/2)*(a + a*tan(c + d*x)*1i)^2),x)
```

```
[Out] int(1/((e*cos(c + d*x))^(9/2)*(a + a*tan(c + d*x)*1i)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))**(9/2)/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Timed out
```

3.672 $\int \frac{1}{(e\cos(c+dx))^{11/2}(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=164

$$-\frac{14\cos^{\frac{11}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^2d(e\cos(c+dx))^{11/2}}+\frac{14\sin(c+dx)\cos^5(c+dx)}{5a^2d(e\cos(c+dx))^{11/2}}+\frac{14\sin(c+dx)\cos^3(c+dx)}{15a^2d(e\cos(c+dx))^{11/2}}-\frac{4i\,\mathrm{co}}{3d\left(a^2+ia^2\tan(c\right.}$$

```
[Out] -14/5*cos(d*x+c)^(11/2)*(cos(1/2*d*x+1/2*c)^2)^(1/2)/cos(1/2*d*x+1/2*c)*Ell
ipticE(sin(1/2*d*x+1/2*c),2^(1/2))/a^2/d/(e*cos(d*x+c))^(11/2)+14/15*cos(d*
x+c)^3*sin(d*x+c)/a^2/d/(e*cos(d*x+c))^(11/2)+14/5*cos(d*x+c)^5*sin(d*x+c)/
a^2/d/(e*cos(d*x+c))^(11/2)-4/3*I*cos(d*x+c)^2/d/(e*cos(d*x+c))^(11/2)/(a^2
+I*a^2*tan(d*x+c))
```

Rubi [A] time = 0.19, antiderivative size = 164, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}} = 0.179$, Rules used = {3515, 3500, 3768, 3771, 2639}

$$\frac{14\sin(c+dx)\cos^5(c+dx)}{5a^2d(e\cos(c+dx))^{11/2}}+\frac{14\sin(c+dx)\cos^3(c+dx)}{15a^2d(e\cos(c+dx))^{11/2}}-\frac{4i\cos^2(c+dx)}{3d\left(a^2+ia^2\tan(c+dx)\right)(e\cos(c+dx))^{11/2}}-\frac{14\cos^{\frac{11}{2}}(c}{5a^2d}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Cos[c + d*x])^(11/2)*(a + I*a*Tan[c + d*x])^2),x]
```

```
[Out] (-14*Cos[c + d*x]^(11/2)*EllipticE[(c + d*x)/2, 2])/(5*a^2*d*(e*Cos[c + d*x
])^(11/2)) + (14*Cos[c + d*x]^3*Sin[c + d*x])/(15*a^2*d*(e*Cos[c + d*x])^(1
1/2)) + (14*Cos[c + d*x]^5*Sin[c + d*x])/(5*a^2*d*(e*Cos[c + d*x])^(11/2))
- (((4*I)/3)*Cos[c + d*x]^2)/(d*(e*Cos[c + d*x])^(11/2)*(a^2 + I*a^2*Tan[c
+ d*x]))
```

Rule 2639

```
Int[Sqrt[sin[(c_.) + (d_.)*(x_)]], x_Symbol] :> Simp[(2*EllipticE[(1*(c - P
i/2 + d*x))/2, 2])/d, x] /; FreeQ[{c, d}, x]
```

Rule 3500

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(2*d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
 f*x])^(n + 1))/(b*f*(m + 2*n)), x] - Dist[(d^2*(m - 2))/(b^2*(m + 2*n)), I
nt[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 2), x], x] /; FreeQ[{
a, b, d, e, f, m}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, -1] && ((ILtQ[n/2, 0]
&& IGtQ[m - 1/2, 0]) || EqQ[n, -2] || IGtQ[m + n, 0] || (IntegersQ[n, m + 1
/2] && GtQ[2*m + n + 1, 0])) && IntegerQ[2*m]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3768

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> -Simp[(b*Cos[c + d*x
]*(b*Csc[c + d*x])^(n - 1))/(d*(n - 1)), x] + Dist[(b^2*(n - 2))/(n - 1), I
nt[(b*Csc[c + d*x])^(n - 2), x], x] /; FreeQ[{b, c, d}, x] && GtQ[n, 1] &&
```

```
IntegerQ[2*n]
```

Rule 3771

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Dist[(b*Csc[c + d*x]
)^n*Sin[c + d*x]^n, Int[1/Sin[c + d*x]^n, x], x] /; FreeQ[{b, c, d}, x] &&
EqQ[n^2, 1/4]
```

Rubi steps

$$\int \frac{1}{(e\cos(c+dx))^{11/2}(a+ia\tan(c+dx))^2}\,dx = \frac{\int \frac{(e\sec(c+dx))^{11/2}}{(a+ia\tan(c+dx))^2}\,dx}{(e\cos(c+dx))^{11/2}(e\sec(c+dx))^{11/2}}$$

$$= -\frac{4i\cos^2(c+dx)}{3d(e\cos(c+dx))^{11/2}\left(a^2+ia^2\tan(c+dx)\right)} + \frac{\left(7e^2\right)\int(\cdots}{3a^2(e\cos(c+\cdots}$$

$$= \frac{14\cos^3(c+dx)\sin(c+dx)}{15a^2d(e\cos(c+dx))^{11/2}} - \frac{4i\cos^2(c+dx)}{3d(e\cos(c+dx))^{11/2}\left(a^2+ia^2\tan\cdots\right.}$$

$$= \frac{14\cos^3(c+dx)\sin(c+dx)}{15a^2d(e\cos(c+dx))^{11/2}} + \frac{14\cos^5(c+dx)\sin(c+dx)}{5a^2d(e\cos(c+dx))^{11/2}} - \frac{\cdots}{3\cdots}$$

$$= \frac{14\cos^3(c+dx)\sin(c+dx)}{15a^2d(e\cos(c+dx))^{11/2}} + \frac{14\cos^5(c+dx)\sin(c+dx)}{5a^2d(e\cos(c+dx))^{11/2}} - \frac{\cdots}{3\cdots}$$

$$= -\frac{14\cos^{\frac{11}{2}}(c+dx)E\left(\frac{1}{2}(c+dx)\middle|2\right)}{5a^2d(e\cos(c+dx))^{11/2}} + \frac{14\cos^3(c+dx)\sin(c+d\cdots}{15a^2d(e\cos(c+dx))^{11/2}}$$

Mathematica [C] time = 5.69, size = 406, normalized size = 2.48

$$\frac{2\sqrt{2}\csc(c)e^{3ic+2idx}(\cos(2c)+i\sin(2c))\cos^{\frac{7}{2}}(c+dx)(\cos(dx)+i\sin(dx))^2\left(-\frac{1}{2}e^{-2ic}\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}\left(7\cdots\right.\right.}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Cos[c + d*x])^(11/2)*(a + I*a*Tan[c + d*x])^2),x]
```

```
[Out] (2*Sqrt[2]*E^((3*I)*c + (2*I)*d*x)*Cos[c + d*x]^(7/2)*Csc[c]*(-42*Sqrt[2 -
(2*I)*E^(I*(c + d*x))]*Sqrt[E^(I*(c + d*x))*(-I + E^(I*(c + d*x)))]*Cos[c +
 d*x]^(5/2)*EllipticE[ArcSin[Sqrt[(-I)*Cos[c + d*x] + Sin[c + d*x]]], -1] +
 42*Sqrt[2 - (2*I)*E^(I*(c + d*x))]*Sqrt[E^(I*(c + d*x))*(-I + E^(I*(c + d*
x)))]*Cos[c + d*x]^(5/2)*EllipticF[ArcSin[Sqrt[(-I)*Cos[c + d*x] + Sin[c +
d*x]]], -1] - (Sqrt[(1 + E^((2*I)*(c + d*x)))/E^(I*(c + d*x))]*((-1 + E^((2
*I)*c))*(47 + 56*E^((2*I)*(c + d*x)) + 21*E^((4*I)*(c + d*x))) + 7*(1 + E^(
(2*I)*(c + d*x)))^(5/2)*Hypergeometric2F1[1/2, 3/4, 7/4, -E^((2*I)*(c + d*x
))]))/(2*E^((2*I)*c)))*(Cos[2*c] + I*Sin[2*c])*(Cos[d*x] + I*Sin[d*x])^2)/(
15*d*(1 + E^((2*I)*(c + d*x)))^3*(e*Cos[c + d*x])^(11/2)*(a + I*a*Tan[c + d
*x])^2)
```

fricas [F] time = 0.62, size = 0, normalized size = 0.00

$$\frac{\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\left(-84i\,e^{(6i\,dx+6i\,c)}-224i\,e^{(4i\,dx+4i\,c)}-188i\,e^{(2i\,dx+2i\,c)}\right)e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}+15\left(a^2de^6e^{(6i\,dx+6i\,c)}+3\,a\cdots\right.}{15\left(a^2de^6e^{(6i\,dx+6i\,c)}+3\,a^2de^6e^{(4i\,dx+4i\,c)}+3\,a^2de\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(11/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas
")
```

```
[Out] 1/15*(sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*(-84*I*e^(6*I*d*x + 6*I*c)
- 224*I*e^(4*I*d*x + 4*I*c) - 188*I*e^(2*I*d*x + 2*I*c))*e^(-1/2*I*d*x - 1/
2*I*c) + 15*(a^2*d*e^6*e^(6*I*d*x + 6*I*c) + 3*a^2*d*e^6*e^(4*I*d*x + 4*I*c
) + 3*a^2*d*e^6*e^(2*I*d*x + 2*I*c) + a^2*d*e^6)*integral(14/5*I*sqrt(1/2)*
sqrt(e*e^(2*I*d*x + 2*I*c) + e)*e^(1/2*I*d*x + 1/2*I*c)/(a^2*d*e^6*e^(2*I*d
*x + 2*I*c) + a^2*d*e^6), x))/(a^2*d*e^6*e^(6*I*d*x + 6*I*c) + 3*a^2*d*e^6*
e^(4*I*d*x + 4*I*c) + 3*a^2*d*e^6*e^(2*I*d*x + 2*I*c) + a^2*d*e^6)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\cos(dx+c))^{\frac{11}{2}}\,(ia\tan(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(11/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate(1/((e*cos(d*x + c))^(11/2)*(I*a*tan(d*x + c) + a)^2), x)
```

maple [A] time = 11.39, size = 321, normalized size = 1.96

$$-\frac{\frac{56\,\mathrm{EllipticE}\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right)\sqrt{2\left(\sin^2\left(\frac{dx}{2}+\frac{c}{2}\right)\right)-1}\,\sqrt{\frac{1}{2}-\frac{\cos(dx+c)}{2}}\,\left(\sin^4\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\frac{112\cos\left(\frac{dx}{2}+\frac{c}{2}\right)\left(\sin^6\left(\frac{dx}{2}+\frac{c}{2}\right)\right)}{5}+\frac{56\,\mathrm{EllipticE}\left(\cos\left(\frac{dx}{2}+\frac{c}{2}\right),\sqrt{2}\right.}{}}{\left(4\left(\sin^4\left(\frac{dx}{2}+\right.\right.\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cos(d*x+c))^(11/2)/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] 2/15/(4*sin(1/2*d*x+1/2*c)^4-4*sin(1/2*d*x+1/2*c)^2+1)/a^2/sin(1/2*d*x+1/2*
c)/(-2*sin(1/2*d*x+1/2*c)^2*e+e)^(1/2)/e^5*(-84*EllipticE(cos(1/2*d*x+1/2*c
),2^(1/2))*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+1/2*c)^2)^(1/2)*si
n(1/2*d*x+1/2*c)^4+168*cos(1/2*d*x+1/2*c)*sin(1/2*d*x+1/2*c)^6+84*EllipticE
(cos(1/2*d*x+1/2*c),2^(1/2))*(2*sin(1/2*d*x+1/2*c)^2-1)^(1/2)*(sin(1/2*d*x+
1/2*c)^2)^(1/2)*sin(1/2*d*x+1/2*c)^2-168*sin(1/2*d*x+1/2*c)^4*cos(1/2*d*x+1
/2*c)+20*I*sin(1/2*d*x+1/2*c)^3-21*(sin(1/2*d*x+1/2*c)^2)^(1/2)*(2*sin(1/2*
d*x+1/2*c)^2-1)^(1/2)*EllipticE(cos(1/2*d*x+1/2*c),2^(1/2))+36*sin(1/2*d*x+
1/2*c)^2*cos(1/2*d*x+1/2*c)-10*I*sin(1/2*d*x+1/2*c))/d
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(11/2)/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima
")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{(e\,\cos(c+d\,x))^{11/2}\,(a+a\,\tan(c+d\,x)\,1{}\mathrm{i})^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cos(c + d*x))^(11/2)*(a + a*tan(c + d*x)*1i)^2),x)
```

```
[Out] int(1/((e*cos(c + d*x))^(11/2)*(a + a*tan(c + d*x)*1i)^2), x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))**(11/2)/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] Timed out
```

3.673 $\int (e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=179

$$-\frac{2i\sqrt{a+ia\tan(c+dx)}\,(e\cos(c+dx))^{7/2}}{7d}+\frac{32ia\sec^4(c+dx)(e\cos(c+dx))^{7/2}}{35d\sqrt{a+ia\tan(c+dx)}}-\frac{16i\sec^2(c+dx)\sqrt{a+ia\tan(c+d}}{35d}$$

```
[Out] 12/35*I*a*(e*cos(d*x+c))^(7/2)*sec(d*x+c)^2/d/(a+I*a*tan(d*x+c))^(1/2)+32/3
5*I*a*(e*cos(d*x+c))^(7/2)*sec(d*x+c)^4/d/(a+I*a*tan(d*x+c))^(1/2)-2/7*I*(e
*cos(d*x+c))^(7/2)*(a+I*a*tan(d*x+c))^(1/2)/d-16/35*I*(e*cos(d*x+c))^(7/2)*
sec(d*x+c)^2*(a+I*a*tan(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.38, antiderivative size = 179, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {3515, 3497, 3502, 3488}

$$-\frac{2i\sqrt{a+ia\tan(c+dx)}\,(e\cos(c+dx))^{7/2}}{7d}+\frac{32ia\sec^4(c+dx)(e\cos(c+dx))^{7/2}}{35d\sqrt{a+ia\tan(c+dx)}}-\frac{16i\sec^2(c+dx)\sqrt{a+ia\tan(c+d}}{35d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cos[c + d*x])^(7/2)*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((12*I)/35)*a*(e*Cos[c + d*x])^(7/2)*Sec[c + d*x]^2)/(d*Sqrt[a + I*a*Tan[c
 + d*x]]) + (((32*I)/35)*a*(e*Cos[c + d*x])^(7/2)*Sec[c + d*x]^4)/(d*Sqrt[a
 + I*a*Tan[c + d*x]]) - (((2*I)/7)*(e*Cos[c + d*x])^(7/2)*Sqrt[a + I*a*Tan[
c + d*x]])/d - (((16*I)/35)*(e*Cos[c + d*x])^(7/2)*Sec[c + d*x]^2*Sqrt[a +
I*a*Tan[c + d*x]])/d
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rubi steps

$$\int (e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}\,dx = \left((e\cos(c+dx))^{7/2}(e\sec(c+dx))^{7/2}\right)\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\sec(c+dx))^{7/2}}\,dx$$

$$= -\frac{2i(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}}{7d} + \frac{\left(6a(e\cos(c+dx))^{7/2}\right.}{}$$

$$= \frac{12ia(e\cos(c+dx))^{7/2}\sec^2(c+dx)}{35d\sqrt{a+ia\tan(c+dx)}} - \frac{2i(e\cos(c+dx))^{7/2}\sqrt{a+ia}}{7d}$$

$$= \frac{12ia(e\cos(c+dx))^{7/2}\sec^2(c+dx)}{35d\sqrt{a+ia\tan(c+dx)}} - \frac{2i(e\cos(c+dx))^{7/2}\sqrt{a+ia}}{7d}$$

$$= \frac{12ia(e\cos(c+dx))^{7/2}\sec^2(c+dx)}{35d\sqrt{a+ia\tan(c+dx)}} + \frac{32ia(e\cos(c+dx))^{7/2}\sec^4(}{35d\sqrt{a+ia\tan(c+d}}$$

Mathematica [A] time = 0.60, size = 80, normalized size = 0.45

$$\frac{e^3\sqrt{a+ia\tan(c+dx)}\sqrt{e\cos(c+dx)}\,(70\sin(c+dx)+6\sin(3(c+dx))+35i\cos(c+dx)+i\cos(3(c+dx)))}{70d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cos[c + d*x])^(7/2)*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (e^3*Sqrt[e*Cos[c + d*x]]*((35*I)*Cos[c + d*x] + I*Cos[3*(c + d*x)] + 70*Si
n[c + d*x] + 6*Sin[3*(c + d*x)])*Sqrt[a + I*a*Tan[c + d*x]])/(70*d)
```

fricas [A] time = 0.70, size = 100, normalized size = 0.56

$$\frac{\sqrt{2}\sqrt{\frac{1}{2}}\left(-5ie^3e^{(6idx+6ic)}-35ie^3e^{(4idx+4ic)}+105ie^3e^{(2idx+2ic)}+7ie^3\right)\sqrt{ee^{(2idx+2ic)}+e}\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}e^{\left(-\frac{5}{2}idx-\frac{5}{2}ic\right)}}{140\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(7/2)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="frica
s")
```

```
[Out] 1/140*sqrt(2)*sqrt(1/2)*(-5*I*e^3*e^(6*I*d*x + 6*I*c) - 35*I*e^3*e^(4*I*d*x
 + 4*I*c) + 105*I*e^3*e^(2*I*d*x + 2*I*c) + 7*I*e^3)*sqrt(e*e^(2*I*d*x + 2*
I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(-5/2*I*d*x - 5/2*I*c)/d
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(7/2)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] Timed out
```

maple [A] time = 1.50, size = 97, normalized size = 0.54

$$\frac{2\left(i\left(\cos^3(dx+c)\right)+6\left(\cos^2(dx+c)\right)\sin(dx+c)+8i\cos(dx+c)+16\sin(dx+c)\right)(e\cos(dx+c))^{\frac{7}{2}}\sqrt{\frac{a(i\sin}{}}}{35d\cos(dx+c)^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^(7/2)*(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 2/35/d*(I*cos(d*x+c)^3+6*cos(d*x+c)^2*sin(d*x+c)+8*I*cos(d*x+c)+16*sin(d*x+
c))*(e*cos(d*x+c))^(7/2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos
(d*x+c)^3
```

maxima [A] time = 0.65, size = 202, normalized size = 1.13

$$\frac{\left(7ie^3\cos\left(\frac{5}{2}dx+\frac{5}{2}c\right)-5ie^3\cos\left(\frac{7}{5}\arctan\left(\sin\left(\frac{5}{2}dx+\frac{5}{2}c\right),\cos\left(\frac{5}{2}dx+\frac{5}{2}c\right)\right)\right)-35ie^3\cos\left(\frac{3}{5}\arctan\left(\sin\left(\frac{5}{2}dx\right.\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(7/2)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxim
a")
```

```
[Out] 1/140*(7*I*e^3*cos(5/2*d*x + 5/2*c) - 5*I*e^3*cos(7/5*arctan2(sin(5/2*d*x +
 5/2*c), cos(5/2*d*x + 5/2*c))) - 35*I*e^3*cos(3/5*arctan2(sin(5/2*d*x + 5/
2*c), cos(5/2*d*x + 5/2*c))) + 105*I*e^3*cos(1/5*arctan2(sin(5/2*d*x + 5/2*
c), cos(5/2*d*x + 5/2*c))) + 7*e^3*sin(5/2*d*x + 5/2*c) + 5*e^3*sin(7/5*arc
tan2(sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 35*e^3*sin(3/5*arctan2(
sin(5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 105*e^3*sin(1/5*arctan2(sin(
5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))))*sqrt(a)*sqrt(e)/d
```

mupad [B] time = 5.17, size = 96, normalized size = 0.54

$$\frac{e^3\sqrt{e\cos(c+dx)}\sqrt{\frac{a(\cos(2c+2dx)+1+\sin(2c+2dx)\,1i)}{\cos(2c+2dx)+1}}\left(\sin(c+dx)+\frac{3\sin(3c+3dx)}{35}+\frac{\cos(c+dx)\,1i}{2}+\frac{\cos(3c+3dx)\,1i}{70}\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^(7/2)*(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] (e^3*(e*cos(c + d*x))^(1/2)*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1
))/(cos(2*c + 2*d*x) + 1))^(1/2)*((cos(c + d*x)*1i)/2 + sin(c + d*x) + (cos
(3*c + 3*d*x)*1i)/70 + (3*sin(3*c + 3*d*x))/35))/d
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**(7/2)*(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

3.674 $\int (e\cos(c+dx))^{5/2}\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=132

$$-\frac{2i\sqrt{a+ia\tan(c+dx)}\,(e\cos(c+dx))^{5/2}}{5d}-\frac{16i\sec^2(c+dx)\sqrt{a+ia\tan(c+dx)}\,(e\cos(c+dx))^{5/2}}{15d}+\frac{8ia\sec^2(c+}{15d\sqrt{a}}$$

```
[Out] 8/15*I*a*(e*cos(d*x+c))^(5/2)*sec(d*x+c)^2/d/(a+I*a*tan(d*x+c))^(1/2)-2/5*I
*(e*cos(d*x+c))^(5/2)*(a+I*a*tan(d*x+c))^(1/2)/d-16/15*I*(e*cos(d*x+c))^(5/
2)*sec(d*x+c)^2*(a+I*a*tan(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.29, antiderivative size = 132, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.133$, Rules used = {3515, 3497, 3502, 3488}

$$-\frac{2i\sqrt{a+ia\tan(c+dx)}\,(e\cos(c+dx))^{5/2}}{5d}-\frac{16i\sec^2(c+dx)\sqrt{a+ia\tan(c+dx)}\,(e\cos(c+dx))^{5/2}}{15d}+\frac{8ia\sec^2(c+}{15d\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cos[c + d*x])^(5/2)*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((8*I)/15)*a*(e*Cos[c + d*x])^(5/2)*Sec[c + d*x]^2)/(d*Sqrt[a + I*a*Tan[c
+ d*x]]) - (((2*I)/5)*(e*Cos[c + d*x])^(5/2)*Sqrt[a + I*a*Tan[c + d*x]])/d
- (((16*I)/15)*(e*Cos[c + d*x])^(5/2)*Sec[c + d*x]^2*Sqrt[a + I*a*Tan[c + d
*x]])/d
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rubi steps

$$\int (e\cos(c+dx))^{5/2}\sqrt{a+ia\tan(c+dx)}\,dx = \left((e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}\right)\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\sec(c+dx))^{5/2}}\,dx$$
$$= -\frac{2i(e\cos(c+dx))^{5/2}\sqrt{a+ia\tan(c+dx)}}{5d} + \frac{\left(4a(e\cos(c+dx))^{5/2}(e\,s\right.}{}$$
$$= \frac{8ia(e\cos(c+dx))^{5/2}\sec^2(c+dx)}{15d\sqrt{a+ia\tan(c+dx)}} - \frac{2i(e\cos(c+dx))^{5/2}\sqrt{a+ia\tan(}}{5d}$$
$$= \frac{8ia(e\cos(c+dx))^{5/2}\sec^2(c+dx)}{15d\sqrt{a+ia\tan(c+dx)}} - \frac{2i(e\cos(c+dx))^{5/2}\sqrt{a+ia\tan(}}{5d}$$

Mathematica [A] time = 0.36, size = 63, normalized size = 0.48

$$\frac{ie^2\sqrt{a+ia\tan(c+dx)}\sqrt{e\cos(c+dx)}(-4i\sin(2(c+dx))+\cos(2(c+dx))-15)}{15d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cos[c + d*x])^(5/2)*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((I/15)*e^2*Sqrt[e*Cos[c + d*x]]*(-15 + Cos[2*(c + d*x)] - (4*I)*Sin[2*(c +
 d*x)])*Sqrt[a + I*a*Tan[c + d*x]])/d
```

fricas [A] time = 0.48, size = 86, normalized size = 0.65

$$\frac{\sqrt{2}\sqrt{\frac{1}{2}}\left(-3i\,e^2e^{(4i\,dx+4i\,c)} - 30i\,e^2e^{(2i\,dx+2i\,c)} + 5i\,e^2\right)\sqrt{ee^{(2i\,dx+2i\,c)}+e}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{3}{2}i\,dx-\frac{3}{2}i\,c\right)}}{30\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(5/2)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="frica
s")
```

```
[Out] 1/30*sqrt(2)*sqrt(1/2)*(-3*I*e^2*e^(4*I*d*x + 4*I*c) - 30*I*e^2*e^(2*I*d*x
+ 2*I*c) + 5*I*e^2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*
I*c) + 1))*e^(-3/2*I*d*x - 3/2*I*c)/d
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(5/2)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:Unable to check sign: (2*pi/t_nostep/2)>(-2*
pi/t_nostep/2)Unable to check sign: (2*pi/t_nostep/2)>(-2*pi/t_nostep/2)Una
ble to check sign: (2*pi/t_nostep/2)>(-2*pi/t_nostep/2)Unable to check sign
: (2*pi/t_nostep/2)>(-2*pi/t_nostep/2)Unable to check sign: (2*pi/t_nostep/
2)>(-2*pi/t_nostep/2)Unable to check sign: (2*pi/t_nostep/2)>(-2*pi/t_noste
p/2)Simplification assuming c near 0Unable to check sign: (2*pi/x/2)>(-2*pi
/x/2)Unable to check sign: (2*pi/x/2)>(-2*pi/x/2)Simplification assuming a
near 0Simplification assuming a near 0Simplification assuming c near 0Simpl
ification assuming d near 0Simplification assuming x near 0Warning, choosin
g root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [7]Warning, choosin
```

```
g root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [-27]Warning, choos
ing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [26]Warning, choo
sing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [-89]Warning, ch
oosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [63]Warning, c
hoosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [-49]Warning,
 choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [-86]Warnin
g, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [-64]Warn
ing, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [-30]Wa
rning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [70]W
arning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [22]
Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [42
]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [5
6]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [
-9]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values
 [-13]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters value
s [46]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters valu
es [24]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters val
ues [49]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters va
lues [-6]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters v
alues [81]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters
values [18]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters
 values [-49]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at paramete
rs values [-33]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parame
ters values [-70]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at para
meters values [8]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at para
meters values [63]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at par
ameters values [-64]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at p
arameters values [2]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at p
arameters values [62]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at
parameters values [-37]Simplification assuming c near 0Unable to check sign
: (2*pi/x/2)>(-2*pi/x/2)Unable to check sign: (2*pi/x/2)>(-2*pi/x/2)Simplif
ication assuming a near 0Simplification assuming a near 0Simplification ass
uming c near 0Simplification assuming d near 0Simplification assuming x nea
r 0Simplification assuming c near 0Unable to check sign: (2*pi/x/2)>(-2*pi/
x/2)Unable to check sign: (2*pi/x/2)>(-2*pi/x/2)Simplification assuming a n
ear 0Simplification assuming a near 0Simplification assuming c near 0Simpli
fication assuming d near 0Simplification assuming x near 0Warning, choosing
 root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [-80]Warning, choosi
ng root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [-23]Warning, choo
sing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [65]Warning, cho
osing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [-85]Warning, c
hoosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [28]Warning,
choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [-44]Warning
, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [-22]Warni
ng, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [93]Warn
ing, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [91]War
ning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [31]Wa
rning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [-21]
Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [88
]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [7
6]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values [
-66]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters values
 [66]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters value
s [5]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters value
s [-23]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters val
ues [79]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters va
lues [-88]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters
values [9]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters
values [6]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameters
```

```
values [-69]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parameter
s values [-8]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at paramete
rs values [31]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at paramet
ers values [89]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parame
ters values [2]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at parame
ters values [97]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at param
eters values [-92]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at par
ameters values [80]Warning, choosing root of [1,0,0,0,%%%{-1,[1]%%%}] at pa
rameters values [-24]Simplification assuming c near 0Unable to check sign:
(2*pi/x/2)>(-2*pi/x/2)Unable to check sign: (2*pi/x/2)>(-2*pi/x/2)Simplific
ation assuming a near 0Simplification assuming a near 0Simplification assum
ing c near 0Simplification assuming d near 0Simplification assuming x near
0sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: B
ad Argument ValueEvaluation time: 5.13Done
```

maple [A] time = 1.44, size = 80, normalized size = 0.61

$$\frac{2\left(i\left(\cos^{2}(dx+c)\right)+4\cos(dx+c)\sin(dx+c)-8i\right)\left(e\cos(dx+c)\right)^{\frac{5}{2}}\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}}{15d\cos(dx+c)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^(5/2)*(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 2/15/d*(I*cos(d*x+c)^2+4*cos(d*x+c)*sin(d*x+c)-8*I)*(e*cos(d*x+c))^(5/2)*(a
*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)^2
```

maxima [A] time = 0.82, size = 148, normalized size = 1.12

$$\left(5ie^{2}\cos\left(\frac{3}{2}dx+\frac{3}{2}c\right)-3ie^{2}\cos\left(\frac{5}{3}\arctan\left(\sin\left(\frac{3}{2}dx+\frac{3}{2}c\right),\cos\left(\frac{3}{2}dx+\frac{3}{2}c\right)\right)\right)-30ie^{2}\cos\left(\frac{1}{3}\arctan\left(\sin\left(\frac{3}{2}dx\right.\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(5/2)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxim
a")
```

```
[Out] 1/30*(5*I*e^2*cos(3/2*d*x + 3/2*c) - 3*I*e^2*cos(5/3*arctan2(sin(3/2*d*x +
3/2*c), cos(3/2*d*x + 3/2*c))) - 30*I*e^2*cos(1/3*arctan2(sin(3/2*d*x + 3/2
*c), cos(3/2*d*x + 3/2*c))) + 5*e^2*sin(3/2*d*x + 3/2*c) + 3*e^2*sin(5/3*ar
ctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 30*e^2*sin(1/3*arctan2
(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))*sqrt(a)*sqrt(e)/d
```

mupad [B] time = 0.77, size = 84, normalized size = 0.64

$$\frac{e^{2}\sqrt{e\cos(c+dx)}\sqrt{\frac{a(\cos(2c+2dx)+1+\sin(2c+2dx)\,1i)}{\cos(2c+2dx)+1}}\,(\cos(2c+2dx)\,1i+4\sin(2c+2dx)-15i)}{15d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^(5/2)*(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] (e^2*(e*cos(c + d*x))^(1/2)*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1
))/(cos(2*c + 2*d*x) + 1))^(1/2)*(cos(2*c + 2*d*x)*1i + 4*sin(2*c + 2*d*x)
- 15i))/(15*d)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**(5/2)*(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

3.675 $\int (e\cos(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=85

$$\frac{4iae\sec(c+dx)\sqrt{e\cos(c+dx)}}{3d\sqrt{a+ia\tan(c+dx)}}-\frac{2i\sqrt{a+ia\tan(c+dx)}\,(e\cos(c+dx))^{3/2}}{3d}$$

```
[Out] 4/3*I*a*e*sec(d*x+c)*(e*cos(d*x+c))^(1/2)/d/(a+I*a*tan(d*x+c))^(1/2)-2/3*I*
(e*cos(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.21, antiderivative size = 86, normalized size of antiderivative = 1.01, number of steps used = 3, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {3515, 3497, 3488}

$$\frac{4ia\sec^2(c+dx)(e\cos(c+dx))^{3/2}}{3d\sqrt{a+ia\tan(c+dx)}}-\frac{2i\sqrt{a+ia\tan(c+dx)}\,(e\cos(c+dx))^{3/2}}{3d}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cos[c + d*x])^(3/2)*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((4*I)/3)*a*(e*Cos[c + d*x])^(3/2)*Sec[c + d*x]^2)/(d*Sqrt[a + I*a*Tan[c +
 d*x]]) - (((2*I)/3)*(e*Cos[c + d*x])^(3/2)*Sqrt[a + I*a*Tan[c + d*x]])/d
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] && !IntegerQ[m]
```

Rubi steps

$$\begin{aligned}\int (e\cos(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}\,dx &= \left((e\cos(c+dx))^{3/2}(e\sec(c+dx))^{3/2}\right)\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\sec(c+dx))^{3/2}}\,dx\\ &= -\frac{2i(e\cos(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}}{3d}+\frac{\left(2a(e\cos(c+dx))^{3/2}(e\,s\right.}{}\\ &= \frac{4ia(e\cos(c+dx))^{3/2}\sec^2(c+dx)}{3d\sqrt{a+ia\tan(c+dx)}}-\frac{2i(e\cos(c+dx))^{3/2}\sqrt{a+ia\tan(}}{3d}\end{aligned}$$

Mathematica [**A**] time = 0.22, size = 56, normalized size = 0.66

$$\frac{2e\sqrt{a+ia\tan(c+dx)}\sqrt{e\cos(c+dx)}(2\sin(c+dx)+i\cos(c+dx))}{3d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cos[c + d*x])^(3/2)*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (2*e*Sqrt[e*Cos[c + d*x]]*(I*Cos[c + d*x] + 2*Sin[c + d*x])*Sqrt[a + I*a*Ta
n[c + d*x]])/(3*d)
```

fricas [**A**] time = 0.41, size = 68, normalized size = 0.80

$$\frac{\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\left(-i\,ee^{(2i\,dx+2i\,c)}+3i\,e\right)\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{3\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="frica
s")
```

```
[Out] 1/3*sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*(-I*e*e^(2*I*d*x + 2*
I*c) + 3*I*e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/d
```

giac [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:Unable to check sign: (2*pi/t_nostep/2)>(-2*
pi/t_nostep/2)Unable to check sign: (2*pi/t_nostep/2)>(-2*pi/t_nostep/2)Una
ble to check sign: (2*pi/t_nostep/2)>(-2*pi/t_nostep/2)Unable to check sign
: (2*pi/t_nostep/2)>(-2*pi/t_nostep/2)Unable to check sign: (2*pi/t_nostep/
2)>(-2*pi/t_nostep/2)Unable to check sign: (2*pi/t_nostep/2)>(-2*pi/t_noste
p/2)Simplification assuming c near 0Unable to check sign: (2*pi/x/2)>(-2*pi
/x/2)Unable to check sign: (2*pi/x/2)>(-2*pi/x/2)Simplification assuming a
near 0Simplification assuming a near 0Simplification assuming c near 0Simpl
ification assuming d near 0Simplification assuming x near 0Simplification a
ssuming c near 0Unable to check sign: (2*pi/x/2)>(-2*pi/x/2)Unable to check
 sign: (2*pi/x/2)>(-2*pi/x/2)Simplification assuming a near 0Simplification
 assuming a near 0Simplification assuming c near 0Simplification assuming d
 near 0Simplification assuming x near 0sym2poly/r2sym(const gen & e,const i
ndex_m & i,const vecteur & l) Error: Bad Argument ValueSimplification assum
ing c near 0Unable to check sign: (2*pi/x/2)>(-2*pi/x/2)Unable to check sig
n: (2*pi/x/2)>(-2*pi/x/2)Simplification assuming a near 0Simplification ass
uming a near 0Simplification assuming c near 0Simplification assuming d nea
r 0Simplification assuming x near 0sym2poly/r2sym(const gen & e,const index
_m & i,const vecteur & l) Error: Bad Argument ValueEvaluation time: 0.49Don
e
```

maple [**A**] time = 1.44, size = 70, normalized size = 0.82

$$\frac{2\left(i\cos\left(dx+c\right)+2\sin\left(dx+c\right)\right)\left(e\cos\left(dx+c\right)\right)^{\frac{3}{2}}\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}}{3d\cos\left(dx+c\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 2/3/d*(I*cos(d*x+c)+2*sin(d*x+c))*(e*cos(d*x+c))^(3/2)*(a*(I*sin(d*x+c)+cos
(d*x+c))/cos(d*x+c))^(1/2)/cos(d*x+c)
```

maxima [A] time = 0.85, size = 59, normalized size = 0.69

$$\frac{\left(-i e \cos\left(\frac{3}{2} dx+\frac{3}{2} c\right)+3 i e \cos\left(\frac{1}{2} dx+\frac{1}{2} c\right)+e \sin\left(\frac{3}{2} dx+\frac{3}{2} c\right)+3 e \sin\left(\frac{1}{2} dx+\frac{1}{2} c\right)\right)\sqrt{a}\sqrt{e}}{3 d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(3/2)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxim
a")
```

```
[Out] 1/3*(-I*e*cos(3/2*d*x + 3/2*c) + 3*I*e*cos(1/2*d*x + 1/2*c) + e*sin(3/2*d*x
 + 3/2*c) + 3*e*sin(1/2*d*x + 1/2*c))*sqrt(a)*sqrt(e)/d
```

mupad [B] time = 0.53, size = 88, normalized size = 1.04

$$\frac{2 e \sqrt{e\left(2\cos\left(\frac{c}{2}+\frac{d x}{2}\right)^2-1\right)}\left(\cos\left(\frac{c}{2}+\frac{d x}{2}\right)^2 2\mathrm{i}+2 \sin(c+d x)-\mathrm{i}\right)\sqrt{\frac{a\left(2\cos(c+d x)^2+\sin(2 c+2 d x) 1\mathrm{i}\right)}{2\cos(c+d x)^2}}}{3 d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] (2*e*(e*(2*cos(c/2 + (d*x)/2)^2 - 1))^(1/2)*(2*sin(c + d*x) + cos(c/2 + (d*
x)/2)^2*2i - 1i)*((a*(sin(2*c + 2*d*x)*1i + 2*cos(c + d*x)^2))/(2*cos(c + d
*x)^2))^(1/2))/(3*d)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**(3/2)*(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

3.676 $\int \sqrt{e\cos(c+dx)}\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=36

$$-\frac{2i\sqrt{a+ia\tan(c+dx)}\sqrt{e\cos(c+dx)}}{d}$$

```
[Out] -2*I*(e*cos(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/d
```

Rubi [A] time = 0.13, antiderivative size = 36, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {3515, 3488}

$$-\frac{2i\sqrt{a+ia\tan(c+dx)}\sqrt{e\cos(c+dx)}}{d}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Cos[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((-2*I)*Sqrt[e*Cos[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]])/d
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] && !IntegerQ[m]
```

Rubi steps

$$\begin{aligned}\int \sqrt{e\cos(c+dx)}\sqrt{a+ia\tan(c+dx)}\,dx &= \left(\sqrt{e\cos(c+dx)}\sqrt{e\sec(c+dx)}\right)\int \frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\,dx\\ &= -\frac{2i\sqrt{e\cos(c+dx)}\sqrt{a+ia\tan(c+dx)}}{d}\end{aligned}$$

Mathematica [A] time = 0.17, size = 36, normalized size = 1.00

$$-\frac{2i\sqrt{a+ia\tan(c+dx)}\sqrt{e\cos(c+dx)}}{d}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Cos[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((-2*I)*Sqrt[e*Cos[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]])/d
```

fricas [A] time = 0.41, size = 52, normalized size = 1.44

$$-\frac{2i\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{ee^{(2idx+2ic)}+e}\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}e^{\left(\frac{1}{2}idx+\frac{1}{2}ic\right)}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="frica
s")
```

```
[Out] -2*I*sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x +
 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c)/d
```

giac [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:Unable to check sign: (2*pi/t_nostep/2)>(-2*
pi/t_nostep/2)Unable to check sign: (2*pi/t_nostep/2)>(-2*pi/t_nostep/2)Una
ble to check sign: (2*pi/t_nostep/2)>(-2*pi/t_nostep/2)Unable to check sign
: (2*pi/t_nostep/2)>(-2*pi/t_nostep/2)Unable to check sign: (2*pi/t_nostep/
2)>(-2*pi/t_nostep/2)Unable to check sign: (2*pi/t_nostep/2)>(-2*pi/t_noste
p/2)Simplification assuming c near 0Unable to check sign: (2*pi/x/2)>(-2*pi
/x/2)Unable to check sign: (2*pi/x/2)>(-2*pi/x/2)Simplification assuming a
near 0Simplification assuming a near 0Simplification assuming c near 0Simpl
ification assuming d near 0Simplification assuming x near 0sym2poly/r2sym(c
onst gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value
Simplification assuming c near 0Unable to check sign: (2*pi/x/2)>(-2*pi/x/2
)Unable to check sign: (2*pi/x/2)>(-2*pi/x/2)Simplification assuming a near
 0Simplification assuming a near 0Simplification assuming c near 0Simplific
ation assuming d near 0Simplification assuming x near 0sym2poly/r2sym(const
 gen & e,const index_m & i,const vecteur & l) Error: Bad Argument ValueEval
uation time: 0.46Done
```

maple [**A**] time = 1.38, size = 45, normalized size = 1.25

$$-\frac{2i\sqrt{e\cos\left(dx+c\right)}\,\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] -2*I/d*(e*cos(d*x+c))^(1/2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)
```

maxima [**B**] time = 0.79, size = 76, normalized size = 2.11

$$-\frac{2i\sqrt{a}\sqrt{e}\sqrt{-\frac{2i\sin(dx+c)}{\cos(dx+c)+1}+\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-1}}{d\sqrt{-\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxim
a")
```

```
[Out] -2*I*sqrt(a)*sqrt(e)*sqrt(-2*I*sin(d*x + c)/(cos(d*x + c) + 1) + sin(d*x +
c)^2/(cos(d*x + c) + 1)^2 - 1)/(d*sqrt(-sin(d*x + c)^2/(cos(d*x + c) + 1)^2
 - 1))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int \sqrt{e\,\cos\left(c+d\,x\right)}\,\sqrt{a+a\,\tan\left(c+d\,x\right)\,1\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^(1/2),x)
[Out] int((e*cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{e\cos\left(c+dx\right)}\sqrt{ia\left(\tan\left(c+dx\right)-i\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**(1/2)*(a+I*a*tan(d*x+c))**(1/2),x)
[Out] Integral(sqrt(e*cos(c + d*x))*sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.677 $\int \frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\cos(c+dx)}}\,dx$

Optimal. Leaf size=335

$$\frac{i\sqrt{2}\sqrt{a}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{a+ia\tan(c+dx)}\sqrt{e\cos(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{d\sqrt{e}}-\frac{i\sqrt{2}\sqrt{a}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{a+ia\tan(c+dx)}\sqrt{e\cos(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{d\sqrt{e}}-\frac{i\sqrt{a}\log\left(-\sqrt{2}\right.}{}$$

```
[Out] -1/2*I*ln(a*e^(1/2)-2^(1/2)*a^(1/2)*(e*cos(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))
^(1/2)+cos(d*x+c)*e^(1/2)*(a+I*a*tan(d*x+c)))*a^(1/2)/d*2^(1/2)/e^(1/2)+1/2
*I*ln(a*e^(1/2)+2^(1/2)*a^(1/2)*(e*cos(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^(1/
2)+cos(d*x+c)*e^(1/2)*(a+I*a*tan(d*x+c)))*a^(1/2)/d*2^(1/2)/e^(1/2)+I*arcta
n(1-2^(1/2)*(e*cos(d*x+c))^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/a^(1/2)/e^(1/2))*
2^(1/2)*a^(1/2)/d/e^(1/2)-I*arctan(1+2^(1/2)*(e*cos(d*x+c))^(1/2)*(a+I*a*ta
n(d*x+c))^(1/2)/a^(1/2)/e^(1/2))*2^(1/2)*a^(1/2)/d/e^(1/2)
```

Rubi [A] time = 0.21, antiderivative size = 335, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.233, Rules used = {3513, 297, 1162, 617, 204, 1165, 628}

$$\frac{i\sqrt{2}\sqrt{a}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{a+ia\tan(c+dx)}\sqrt{e\cos(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{d\sqrt{e}}-\frac{i\sqrt{2}\sqrt{a}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{a+ia\tan(c+dx)}\sqrt{e\cos(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{d\sqrt{e}}-\frac{i\sqrt{a}\log\left(-\sqrt{2}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a + I*a*Tan[c + d*x]]/Sqrt[e*Cos[c + d*x]],x]
```

```
[Out] (I*Sqrt[2]*Sqrt[a]*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cos[c + d*x]]*Sqrt[a + I*a*Ta
n[c + d*x]])/(Sqrt[a]*Sqrt[e])])/(d*Sqrt[e]) - (I*Sqrt[2]*Sqrt[a]*ArcTan[1
+ (Sqrt[2]*Sqrt[e*Cos[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]])/(Sqrt[a]*Sqrt[e
])])/(d*Sqrt[e]) - (I*Sqrt[a]*Log[a*Sqrt[e] - Sqrt[2]*Sqrt[a]*Sqrt[e*Cos[c
+ d*x]]*Sqrt[a + I*a*Tan[c + d*x]] + Sqrt[e]*Cos[c + d*x]*(a + I*a*Tan[c +
d*x])])/(Sqrt[2]*d*Sqrt[e]) + (I*Sqrt[a]*Log[a*Sqrt[e] + Sqrt[2]*Sqrt[a]*Sq
rt[e*Cos[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]] + Sqrt[e]*Cos[c + d*x]*(a + I
*a*Tan[c + d*x])])/(Sqrt[2]*d*Sqrt[e])
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3513

```
Int[Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]]/Sqrt[cos[(e_.) + (f_.)*(x_)]
*(d_.)], x_Symbol] :> Dist[(-4*b)/f, Subst[Int[x^2/(a^2*d^2 + x^4), x], x,
Sqrt[d*Cos[e + f*x]]*Sqrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, d, e, f}
, x] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\cos(c+dx)}}\,dx = -\frac{(4ia)\,\text{Subst}\left(\int \frac{x^2}{a^2e^2+x^4}\,dx, x, \sqrt{e\cos(c+dx)}\,\sqrt{a+ia\tan(c+dx)}\right)}{d}$$

$$= \frac{(2ia)\,\text{Subst}\left(\int \frac{ae-x^2}{a^2e^2+x^4}\,dx, x, \sqrt{e\cos(c+dx)}\,\sqrt{a+ia\tan(c+dx)}\right)}{d} - \frac{(2ia)\,\text{Subst}\Big(}{}$$

$$= -\frac{(ia)\,\text{Subst}\left(\int \frac{1}{ae-\sqrt{2}\sqrt{a}\sqrt{e}x+x^2}\,dx, x, \sqrt{e\cos(c+dx)}\,\sqrt{a+ia\tan(c+dx)}\right)}{d} - \frac{(ia)\,\text{S}}{}$$

$$= -\frac{i\sqrt{a}\log\left(a\sqrt{e}-\sqrt{2}\sqrt{a}\sqrt{e\cos(c+dx)}\,\sqrt{a+ia\tan(c+dx)}+\sqrt{e}\cos(c+dx)(a\right.}{\sqrt{2}\,d\sqrt{e}}$$

$$= \frac{i\sqrt{2}\sqrt{a}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cos(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{d\sqrt{e}} - \frac{i\sqrt{2}\sqrt{a}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e\cos(c+}}{}\right.}{d\sqrt{e}}$$

Mathematica [A] time = 0.89, size = 125, normalized size = 0.37

$$\frac{i\left(-e^{-2ic}\right)^{3/4}e^{-\frac{3}{2}idx}\left(1+e^{2i(c+dx)}\right)\sqrt{a+ia\tan(c+dx)}\left(\tan^{-1}\left(\frac{e^{\frac{idx}{2}}}{\sqrt[4]{-e^{-2ic}}}\right)-\tanh^{-1}\left(\frac{e^{\frac{idx}{2}}}{\sqrt[4]{-e^{-2ic}}}\right)\right)}{d\sqrt{e\cos(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a + I*a*Tan[c + d*x]]/Sqrt[e*Cos[c + d*x]],x]
```

```
[Out] (I*(-E^((-2*I)*c))^(3/4)*(1 + E^((2*I)*(c + d*x)))*(ArcTan[E^((I/2)*d*x)/(-
E^((-2*I)*c))^(1/4)] - ArcTanh[E^((I/2)*d*x)/(-E^((-2*I)*c))^(1/4)])*Sqrt[a
 + I*a*Tan[c + d*x]])/(d*E^(((3*I)/2)*d*x)*Sqrt[e*Cos[c + d*x]])
```

fricas [A] time = 0.48, size = 313, normalized size = 0.93

$$-\frac{1}{2}\sqrt{\frac{4ia}{d^2e}}\log\left(\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}+\frac{1}{2}i\,de\sqrt{\frac{4ia}{d^2e}}\right)+\frac{1}{2}\sqrt{\frac{4ia}{d^2e}}\log\left(\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{ee}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*cos(d*x+c))^(1/2),x, algorithm="frica
s")
```

```
[Out] -1/2*sqrt(4*I*a/(d^2*e))*log(sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) +
 e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c) + 1/2*I*d*e*
sqrt(4*I*a/(d^2*e))) + 1/2*sqrt(4*I*a/(d^2*e))*log(sqrt(2)*sqrt(1/2)*sqrt(e
*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x -
 1/2*I*c) - 1/2*I*d*e*sqrt(4*I*a/(d^2*e))) - 1/2*sqrt(-4*I*a/(d^2*e))*log(s
qrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c
) + 1))*e^(-1/2*I*d*x - 1/2*I*c) + 1/2*I*d*e*sqrt(-4*I*a/(d^2*e))) + 1/2*sq
rt(-4*I*a/(d^2*e))*log(sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sq
rt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c) - 1/2*I*d*e*sqrt(-
4*I*a/(d^2*e)))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{i\,a\tan\left(dx+c\right)+a}}{\sqrt{e\cos\left(dx+c\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*cos(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)/sqrt(e*cos(d*x + c)), x)
```

maple [A] time = 1.54, size = 226, normalized size = 0.67

$$-\frac{\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\cos\left(dx+c\right)\left(-1+\cos\left(dx+c\right)\right)\left(i\,\mathrm{arctanh}\left(\frac{\sqrt{\frac{1}{1+\cos(dx+c)}}\,(\cos(dx+c)+1+\sin(dx+c))}{2}\right)+i\,\mathrm{arctanh}\right.}{d\sin\left(dx+c\right)\sqrt{e\cos\left(dx+c\right)}\,(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^(1/2)/(e*cos(d*x+c))^(1/2),x)
```

```
[Out] -1/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*cos(d*x+c)*(-1+cos(d*x+
c))*(I*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+I*ar
ctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(-cos(d*x+c)-1+sin(d*x+c)))-arctanh(1/2*
(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+arctanh(1/2*(1/(1+cos(d
*x+c)))^(1/2)*(-cos(d*x+c)-1+sin(d*x+c))))/sin(d*x+c)/(e*cos(d*x+c))^(1/2)/
(I*sin(d*x+c)+cos(d*x+c)-1)/(1/(1+cos(d*x+c)))^(1/2)
```

maxima [B] time = 0.88, size = 1400, normalized size = 4.18

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*cos(d*x+c))^(1/2),x, algorithm="maxim
a")
```

```
[Out] 1/4*(-2*I*sqrt(2)*arctan2(sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos
(3/2*d*x + 3/2*c))) + 1, sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(
3/2*d*x + 3/2*c))) + 1) - 2*I*sqrt(2)*arctan2(sqrt(2)*cos(1/3*arctan2(sin(3
/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1, -sqrt(2)*sin(1/3*arctan2(sin(3
/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) - 2*I*sqrt(2)*arctan2(sqrt(2)*
cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 1, sqrt(2)*s
in(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) - 2*I*sqrt
(2)*arctan2(sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2
*c))) - 1, -sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2
*c))) + 1) - 2*sqrt(2)*arctan2(sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c)
, cos(3/2*d*x + 3/2*c))) + sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*
x + 3/2*c))), sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3
/2*c))) + cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1)
 + 2*sqrt(2)*arctan2(-sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2
*d*x + 3/2*c))) + sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c
))), -sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))
+ cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) + I*sqr
t(2)*log(2*sqrt(2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*
c)))*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2*(sqrt
(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1)*cos(2
/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + cos(2/3*arctan2(s
in(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*cos(1/3*arctan2(sin(3/2*d
*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + sin(2/3*arctan2(sin(3/2*d*x + 3/2*c
), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3
/2*d*x + 3/2*c)))^2 + 2*sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3
/2*d*x + 3/2*c))) + 1) - I*sqrt(2)*log(-2*sqrt(2)*sin(2/3*arctan2(sin(3/2*d
*x + 3/2*c), cos(3/2*d*x + 3/2*c)))*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), c
os(3/2*d*x + 3/2*c))) - 2*(sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), co
s(3/2*d*x + 3/2*c))) - 1)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x
 + 3/2*c))) + cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^
2 + 2*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + sin(
2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arct
an2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 - 2*sqrt(2)*cos(1/3*arct
an2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) + sqrt(2)*log(2*cos(1
/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arcta
n2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sqrt(2)*cos(1/3*arcta
n2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2*sqrt(2)*sin(1/3*arctan2
(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2) - sqrt(2)*log(2*cos(1/3*
arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2(
sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sqrt(2)*cos(1/3*arctan2(
sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 2*sqrt(2)*sin(1/3*arctan2(si
n(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2) + sqrt(2)*log(2*cos(1/3*arc
tan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2(sin
(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 - 2*sqrt(2)*cos(1/3*arctan2(sin
(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2*sqrt(2)*sin(1/3*arctan2(sin(3
/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2) - sqrt(2)*log(2*cos(1/3*arctan
2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2(sin(3/
2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 - 2*sqrt(2)*cos(1/3*arctan2(sin(3/
2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 2*sqrt(2)*sin(1/3*arctan2(sin(3/2*
d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2))*sqrt(a)/(d*sqrt(e))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\sqrt{a+a\tan(c+d\,x)\,1\mathrm{i}}}{\sqrt{e\,\cos(c+d\,x)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(1/2)/(e*cos(c + d*x))^(1/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^(1/2)/(e*cos(c + d*x))^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{ia\left(\tan\left(c+dx\right)-i\right)}}{\sqrt{e\cos\left(c+dx\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**(1/2)/(e*cos(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(I*a*(tan(c + d*x) - I))/sqrt(e*cos(c + d*x)), x)
```

3.678 $\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\cos(c+dx))^{3/2}}\,dx$

Optimal. Leaf size=524

$$-\frac{ia^{3/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{a-ia\tan(c+dx)}\sqrt{e\cos(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{\sqrt{2}\,de^{3/2}\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}+\frac{ia^{3/2}\sec(c+dx)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{a-ia\tan(c+dx)}\sqrt{e\cos(c+\cdots}}{\sqrt{a}\sqrt{e}}\right.}{\sqrt{2}\,de^{3/2}\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}\cdots}$$

```
[Out] I*a/d/(e*cos(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2)-1/2*I*a^(3/2)*arctan(1-
2^(1/2)*(e*cos(d*x+c))^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/a^(1/2)/e^(1/2))*sec(
d*x+c)/d/e^(3/2)*2^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)+
1/2*I*a^(3/2)*arctan(1+2^(1/2)*(e*cos(d*x+c))^(1/2)*(a-I*a*tan(d*x+c))^(1/2
)/a^(1/2)/e^(1/2))*sec(d*x+c)/d/e^(3/2)*2^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a
+I*a*tan(d*x+c))^(1/2)+1/4*I*a^(3/2)*ln(a-2^(1/2)*a^(1/2)*(e*cos(d*x+c))^(1
/2)*(a-I*a*tan(d*x+c))^(1/2)/e^(1/2)+cos(d*x+c)*(a-I*a*tan(d*x+c)))*sec(d*x
+c)/d/e^(3/2)*2^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)-1/4
*I*a^(3/2)*ln(a+2^(1/2)*a^(1/2)*(e*cos(d*x+c))^(1/2)*(a-I*a*tan(d*x+c))^(1/
2)/e^(1/2)+cos(d*x+c)*(a-I*a*tan(d*x+c)))*sec(d*x+c)/d/e^(3/2)*2^(1/2)/(a-I
*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)
```

Rubi [A] time = 0.59, antiderivative size = 620, normalized size of antiderivative = 1.18, number of steps used = 13, number of rules used = 10, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {3515, 3498, 3499, 3495, 297, 1162, 617, 204, 1165, 628}

$$-\frac{ia^{3/2}e^{3/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\,d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}\,(e\cos(c+dx))^{3/2}(e\sec(c+dx))^{3/2}}+\frac{ia^{3/2}e^{3/2}\sec(c\cdots}{\sqrt{2}\,d\sqrt{a-ia\tan(c+dx)}\sqrt{a\cdots}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a + I*a*Tan[c + d*x]]/(e*Cos[c + d*x])^(3/2),x]
```

```
[Out] (I*a)/(d*(e*Cos[c + d*x])^(3/2)*Sqrt[a + I*a*Tan[c + d*x]]) - (I*a^(3/2)*e^
(3/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])/(Sqrt[a]*Sqrt
[e*Sec[c + d*x]])]*Sec[c + d*x])/(Sqrt[2]*d*(e*Cos[c + d*x])^(3/2)*(e*Sec[c
 + d*x])^(3/2)*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) + (I*
a^(3/2)*e^(3/2)*ArcTan[1 + (Sqrt[2]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])/(Sq
rt[a]*Sqrt[e*Sec[c + d*x]])]*Sec[c + d*x])/(Sqrt[2]*d*(e*Cos[c + d*x])^(3/2
)*(e*Sec[c + d*x])^(3/2)*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*
x]]) + ((I/2)*a^(3/2)*e^(3/2)*Log[a - (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a - I*a
*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a - I*a*Tan[c + d*x])]
*Sec[c + d*x])/(Sqrt[2]*d*(e*Cos[c + d*x])^(3/2)*(e*Sec[c + d*x])^(3/2)*Sqr
t[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) - ((I/2)*a^(3/2)*e^(3/2
)*Log[a + (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])/Sqrt[e*Sec[c
 + d*x]] + Cos[c + d*x]*(a - I*a*Tan[c + d*x])]*Sec[c + d*x])/(Sqrt[2]*d*(e
*Cos[c + d*x])^(3/2)*(e*Sec[c + d*x])^(3/2)*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt
[a + I*a*Tan[c + d*x]])
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
```

```
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3495

```
Int[Sqrt[(d_.)*sec[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[(-4*b*d^2)/f, Subst[Int[x^2/(a^2 + d^2*x^4), x],
 x, Sqrt[a + b*Tan[e + f*x]]/Sqrt[d*Sec[e + f*x]]], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3498

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m}, x] && EqQ[a^2 + b^2, 0] && GtQ[n, 0] && NeQ[m + n - 1, 0] && IntegersQ[
2*m, 2*n]
```

Rule 3499

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(3/2)/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_
.)*(x_)]], x_Symbol] :> Dist[(d*Sec[e + f*x])/(Sqrt[a - b*Tan[e + f*x]]*Sqr
t[a + b*Tan[e + f*x]]), Int[Sqrt[d*Sec[e + f*x]]*Sqrt[a - b*Tan[e + f*x]],
x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rubi steps

$$\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\cos(c+dx))^{3/2}}\,dx = \frac{\int (e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}\,dx}{(e\cos(c+dx))^{3/2}(e\sec(c+dx))^{3/2}}$$

$$= \frac{ia}{d(e\cos(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}} + \frac{a\int \frac{(e\sec(c+dx))^{3/2}}{\sqrt{a+ia\tan(c+dx)}}\,dx}{2(e\cos(c+dx))^{3/2}(e\sec(c+dx))^{3/2}}$$

$$= \frac{ia}{d(e\cos(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}} + \frac{(ae\sec(c+dx))\int \sqrt{e\sec(c+}}{2(e\cos(c+dx))^{3/2}(e\sec(c+dx))^{3/2}\sqrt{a}}$$

$$= \frac{ia}{d(e\cos(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}} + \frac{\left(2ia^2e^3\sec(c+dx)\right)\mathrm{Subst}\left(\int\right.}{d(e\cos(c+dx))^{3/2}(e\sec(c+dx))^{3/2}\sqrt{a}}$$

$$= \frac{ia}{d(e\cos(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}} - \frac{\left(ia^2e^2\sec(c+dx)\right)\mathrm{Subst}\left(\int\right.}{d(e\cos(c+dx))^{3/2}(e\sec(c+dx))^{3/2}\sqrt{a}}$$

$$= \frac{ia}{d(e\cos(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}} + \frac{\left(ia^2e\sec(c+dx)\right)\mathrm{Subst}\left(\int \frac{}{\frac{a}{e}-}\right.}{2d(e\cos(c+dx))^{3/2}(e\sec(c+dx))^{3/2}\sqrt{a}}$$

$$= \frac{ia}{d(e\cos(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}} + \frac{ia^{3/2}e^{3/2}\log\left(a-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\right.}{2\sqrt{2}\,d(e\cos(c+dx))^{3/2}(e\sec(c+dx}$$

$$= \frac{ia}{d(e\cos(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}} - \frac{ia^{3/2}e^{3/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}}{\sqrt{a}}\right.}{\sqrt{2}\,d(e\cos(c+dx))^{3/2}(e\sec(c+dx))^{3/2}}$$

Mathematica [A] time = 3.85, size = 274, normalized size = 0.52

$$\frac{ie^{-\frac{1}{2}i(c+dx)}\cos^2(c+dx)\sqrt{a+ia\tan(c+dx)}\,(\cos(c+dx)+i\sin(c+dx))\left(-2i\sqrt{2}\sin\left(\frac{1}{2}(c+dx)\right)+2\sqrt{2}\cos\left(\frac{1}{2}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a + I*a*Tan[c + d*x]]/(e*Cos[c + d*x])^(3/2),x]
```

```
[Out] (I*Cos[c + d*x]^2*(2*Sqrt[2]*Cos[(c + d*x)/2] + 2*ArcTan[1 - Sqrt[2]*E^((I/
2)*(c + d*x))]*Cos[c + d*x] - 2*ArcTan[1 + Sqrt[2]*E^((I/2)*(c + d*x))]*Cos
[c + d*x] + Cos[c + d*x]*Log[1 - Sqrt[2]*E^((I/2)*(c + d*x)) + E^(I*(c + d*
x))] - Cos[c + d*x]*Log[1 + Sqrt[2]*E^((I/2)*(c + d*x)) + E^(I*(c + d*x))]
- (2*I)*Sqrt[2]*Sin[(c + d*x)/2])*(Cos[c + d*x] + I*Sin[c + d*x])*Sqrt[a +
I*a*Tan[c + d*x]])/(Sqrt[2]*d*E^((I/2)*(c + d*x))*(1 + E^((2*I)*(c + d*x)))
*(e*Cos[c + d*x])^(3/2))
```

fricas [A] time = 0.56, size = 470, normalized size = 0.90

$$\frac{4i\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{ee^{(2idx+2ic)}+e}\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}\,e^{\left(\frac{1}{2}idx+\frac{1}{2}ic\right)}-\left(de^2e^{(2idx+2ic)}+de^2\right)\sqrt{\frac{ia}{d^2e^3}}\log\left(de^2\sqrt{\frac{ia}{d^2e^3}}+\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{ee^{(2}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*cos(d*x+c))^(3/2),x, algorithm="frica
s")
```

```
[Out] 1/2*(4*I*sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d
*x + 2*I*c) + 1))*e^(1/2*I*d*x + 1/2*I*c) - (d*e^2*e^(2*I*d*x + 2*I*c) + d*
e^2)*sqrt(I*a/(d^2*e^3))*log(d*e^2*sqrt(I*a/(d^2*e^3)) + sqrt(2)*sqrt(1/2)*
sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I
*d*x - 1/2*I*c)) + (d*e^2*e^(2*I*d*x + 2*I*c) + d*e^2)*sqrt(I*a/(d^2*e^3))*
log(-d*e^2*sqrt(I*a/(d^2*e^3)) + sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*
c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)) + (d*e^
2*e^(2*I*d*x + 2*I*c) + d*e^2)*sqrt(-I*a/(d^2*e^3))*log(d*e^2*sqrt(-I*a/(d^
2*e^3)) + sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*
d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)) - (d*e^2*e^(2*I*d*x + 2*I*c) +
 d*e^2)*sqrt(-I*a/(d^2*e^3))*log(-d*e^2*sqrt(-I*a/(d^2*e^3)) + sqrt(2)*sqrt
(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(
-1/2*I*d*x - 1/2*I*c)))/(d*e^2*e^(2*I*d*x + 2*I*c) + d*e^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{i\, a \tan\left(dx + c\right) + a}}{\left(e \cos\left(dx + c\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*cos(d*x+c))^(3/2),x, algorithm="giac"
)
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)/(e*cos(d*x + c))^(3/2), x)
```

maple [A] time = 1.53, size = 308, normalized size = 0.59

$$\frac{\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\ \cos\left(dx+c\right)\left(-1+\cos\left(dx+c\right)\right)^{2}\left(i\cos\left(dx+c\right)\operatorname{arctanh}\left(\frac{\sqrt{\frac{1}{1+\cos(dx+c)}}\ \left(-\cos(dx+c)-1+\sin(dx+c)\right)}{2}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^(1/2)/(e*cos(d*x+c))^(3/2),x)
```

```
[Out] 1/2/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*cos(d*x+c)*(-1+cos(d*x
+c))^2*(I*cos(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(-cos(d*x+c)-1+si
n(d*x+c)))+I*cos(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+
sin(d*x+c)))+2*I*(1/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)-cos(d*x+c)*arctanh(1/2
*(1/(1+cos(d*x+c)))^(1/2)*(-cos(d*x+c)-1+sin(d*x+c)))+cos(d*x+c)*arctanh(1/
2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))-2*cos(d*x+c)*(1/(1+co
s(d*x+c)))^(1/2)-2*(1/(1+cos(d*x+c)))^(1/2))/sin(d*x+c)^3/(I*sin(d*x+c)+cos
(d*x+c)-1)/(1/(1+cos(d*x+c)))^(3/2)/(e*cos(d*x+c))^(3/2)
```

maxima [B] time = 1.40, size = 1834, normalized size = 3.50

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*cos(d*x+c))^(3/2),x, algorithm="maxim
a")
```

```
[Out] -(16*(sqrt(2)*cos(2*d*x + 2*c) + I*sqrt(2)*sin(2*d*x + 2*c) + sqrt(2))*arct
an2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1, sqrt(
2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + 16*(sqrt(2)*
cos(2*d*x + 2*c) + I*sqrt(2)*sin(2*d*x + 2*c) + sqrt(2))*arctan2(sqrt(2)*co
s(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1, -sqrt(2)*sin(1/4*ar
```

```
ctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + 16*(sqrt(2)*cos(2*d*x + 2
*c) + I*sqrt(2)*sin(2*d*x + 2*c) + sqrt(2))*arctan2(sqrt(2)*cos(1/4*arctan2
(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 1, sqrt(2)*sin(1/4*arctan2(sin(2*d*
x + 2*c), cos(2*d*x + 2*c))) + 1) + 16*(sqrt(2)*cos(2*d*x + 2*c) + I*sqrt(2
)*sin(2*d*x + 2*c) + sqrt(2))*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c))) - 1, -sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c))) + 1) + (16*I*sqrt(2)*cos(2*d*x + 2*c) - 16*sqrt(2)*sin(2*d*
x + 2*c) + 16*I*sqrt(2))*arctan2(sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c),
cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))),
sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arct
an2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (-16*I*sqrt(2)*cos(2*d*x +
2*c) + 16*sqrt(2)*sin(2*d*x + 2*c) - 16*I*sqrt(2))*arctan2(-sqrt(2)*sin(1/4
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c))), -sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) +
 8*(sqrt(2)*cos(2*d*x + 2*c) + I*sqrt(2)*sin(2*d*x + 2*c) + sqrt(2))*log(2*
sqrt(2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/4*arctan
2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2*(sqrt(2)*cos(1/4*arctan2(sin(2*d
*x + 2*c), cos(2*d*x + 2*c))) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*
d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*c
os(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin
(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), c
os(2*d*x + 2*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c))) + 1) - 8*(sqrt(2)*cos(2*d*x + 2*c) + I*sqrt(2)*sin(2*d*x + 2*c) +
 sqrt(2))*log(-2*sqrt(2)*sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
))*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 2*(sqrt(2)*cos(1/
4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 1)*cos(1/2*arctan2(sin(2*d
*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c)))^2 + 2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + si
n(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(si
n(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x
+ 2*c), cos(2*d*x + 2*c))) + 1) + (8*I*sqrt(2)*cos(2*d*x + 2*c) - 8*sqrt(2)
*sin(2*d*x + 2*c) + 8*I*sqrt(2))*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2*sqr
t(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) + (-8*I*sqrt
(2)*cos(2*d*x + 2*c) + 8*sqrt(2)*sin(2*d*x + 2*c) - 8*I*sqrt(2))*log(2*cos(
1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(
2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x +
2*c), cos(2*d*x + 2*c))) - 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(
2*d*x + 2*c))) + 2) + (8*I*sqrt(2)*cos(2*d*x + 2*c) - 8*sqrt(2)*sin(2*d*x +
 2*c) + 8*I*sqrt(2))*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*
c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sqrt(
2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2*sqrt(2)*sin(1/4
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) + (-8*I*sqrt(2)*cos(2*d*
x + 2*c) + 8*sqrt(2)*sin(2*d*x + 2*c) - 8*I*sqrt(2))*log(2*cos(1/4*arctan2(
sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c)
, cos(2*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*
d*x + 2*c))) - 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
)) + 2) - 128*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 128*I*
sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))))*sqrt(a)*sqrt(e)/((-64
*I*e^2*cos(2*d*x + 2*c) + 64*e^2*sin(2*d*x + 2*c) - 64*I*e^2)*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\sqrt{a + a \tan (c + d x) \, 1\mathrm{i}}}{(e \cos (c + d x))^{3/2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(1/2)/(e*cos(c + d*x))^(3/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^(1/2)/(e*cos(c + d*x))^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{ia\left(\tan\left(c+dx\right)-i\right)}}{\left(e\cos\left(c+dx\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**(1/2)/(e*cos(d*x+c))**(3/2),x)
```

```
[Out] Integral(sqrt(I*a*(tan(c + d*x) - I))/(e*cos(c + d*x))**(3/2), x)
```

3.679 $\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\cos(c+dx))^{5/2}}\,dx$

Optimal. Leaf size=512

$$\frac{3i\sqrt{a}\,e^{5/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{4\sqrt{2}\,d(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}}-\frac{3i\sqrt{a}\,e^{5/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{4\sqrt{2}\,d(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}}-\frac{3i\sqrt{a}\,e^{5/2}\log\left(-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{\ldots}}{\sqrt{e\sec\ldots}}\right.}{8\sqrt{2}\,d(\ldots}$$

```
[Out] 3/8*I*e^(5/2)*arctan(1-2^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*
sec(d*x+c))^(1/2))*a^(1/2)/d/(e*cos(d*x+c))^(5/2)/(e*sec(d*x+c))^(5/2)*2^(1
/2)-3/8*I*e^(5/2)*arctan(1+2^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/a^(1/2)
/(e*sec(d*x+c))^(1/2))*a^(1/2)/d/(e*cos(d*x+c))^(5/2)/(e*sec(d*x+c))^(5/2)*
2^(1/2)-3/16*I*e^(5/2)*ln(a-2^(1/2)*a^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2
)/(e*sec(d*x+c))^(1/2)+cos(d*x+c)*(a+I*a*tan(d*x+c)))*a^(1/2)/d/(e*cos(d*x+
c))^(5/2)/(e*sec(d*x+c))^(5/2)*2^(1/2)+3/16*I*e^(5/2)*ln(a+2^(1/2)*a^(1/2)*
e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2)+cos(d*x+c)*(a+I*a*tan
(d*x+c)))*a^(1/2)/d/(e*cos(d*x+c))^(5/2)/(e*sec(d*x+c))^(5/2)*2^(1/2)+1/2*I
*a/d/(e*cos(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(1/2)-3/4*I*cos(d*x+c)^2*(a+I*
a*tan(d*x+c))^(1/2)/d/(e*cos(d*x+c))^(5/2)
```

Rubi [A] time = 0.56, antiderivative size = 512, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {3515, 3498, 3501, 3495, 297, 1162, 617, 204, 1165, 628}

$$\frac{3i\sqrt{a}\,e^{5/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{4\sqrt{2}\,d(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}}-\frac{3i\sqrt{a}\,e^{5/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{4\sqrt{2}\,d(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}}-\frac{3i\sqrt{a}\,e^{5/2}\log\left(-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{\ldots}}{\sqrt{e\sec\ldots}}\right.}{8\sqrt{2}\,d(\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a + I*a*Tan[c + d*x]]/(e*Cos[c + d*x])^(5/2),x]
```

```
[Out] (((3*I)/4)*Sqrt[a]*e^(5/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e]*Sqrt[a + I*a*Tan[c +
 d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])]])/(Sqrt[2]*d*(e*Cos[c + d*x])^(5/2)*
(e*Sec[c + d*x])^(5/2)) - (((3*I)/4)*Sqrt[a]*e^(5/2)*ArcTan[1 + (Sqrt[2]*Sq
rt[e]*Sqrt[a + I*a*Tan[c + d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])]])/(Sqrt[2]
*d*(e*Cos[c + d*x])^(5/2)*(e*Sec[c + d*x])^(5/2)) - (((3*I)/8)*Sqrt[a]*e^(5
/2)*Log[a - (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]])/Sqrt[e*Sec
[c + d*x]] + Cos[c + d*x]*(a + I*a*Tan[c + d*x])]])/(Sqrt[2]*d*(e*Cos[c + d*
x])^(5/2)*(e*Sec[c + d*x])^(5/2)) + (((3*I)/8)*Sqrt[a]*e^(5/2)*Log[a + (Sqr
t[2]*Sqrt[a]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos
[c + d*x]*(a + I*a*Tan[c + d*x])]])/(Sqrt[2]*d*(e*Cos[c + d*x])^(5/2)*(e*Sec
[c + d*x])^(5/2)) + ((I/2)*a)/(d*(e*Cos[c + d*x])^(5/2)*Sqrt[a + I*a*Tan[c
+ d*x]]) - (((3*I)/4)*Cos[c + d*x]^2*Sqrt[a + I*a*Tan[c + d*x]])/(d*(e*Cos[
c + d*x])^(5/2))
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3495

```
Int[Sqrt[(d_.)*sec[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[(-4*b*d^2)/f, Subst[Int[x^2/(a^2 + d^2*x^4), x],
 x, Sqrt[a + b*Tan[e + f*x]]/Sqrt[d*Sec[e + f*x]]], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3498

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m}, x] && EqQ[a^2 + b^2, 0] && GtQ[n, 0] && NeQ[m + n - 1, 0] && IntegersQ[
2*m, 2*n]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rubi steps

$$\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\cos(c+dx))^{5/2}}\,dx = \frac{\int (e\sec(c+dx))^{5/2}\sqrt{a+ia\tan(c+dx)}\,dx}{(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}}$$

$$= \frac{ia}{2d(e\cos(c+dx))^{5/2}\sqrt{a+ia\tan(c+dx)}} + \frac{(3a)\int \frac{(e\sec(c+dx))^{5/2}}{\sqrt{a+ia\tan(c+dx)}}\,dx}{4(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}}$$

$$= \frac{ia}{2d(e\cos(c+dx))^{5/2}\sqrt{a+ia\tan(c+dx)}} - \frac{3i\cos^2(c+dx)\sqrt{a+ia\tan(c+dx)}}{4d(e\cos(c+dx))^{5/2}} +$$

$$= \frac{ia}{2d(e\cos(c+dx))^{5/2}\sqrt{a+ia\tan(c+dx)}} - \frac{3i\cos^2(c+dx)\sqrt{a+ia\tan(c+dx)}}{4d(e\cos(c+dx))^{5/2}} -$$

$$= \frac{ia}{2d(e\cos(c+dx))^{5/2}\sqrt{a+ia\tan(c+dx)}} - \frac{3i\cos^2(c+dx)\sqrt{a+ia\tan(c+dx)}}{4d(e\cos(c+dx))^{5/2}} +$$

$$= \frac{ia}{2d(e\cos(c+dx))^{5/2}\sqrt{a+ia\tan(c+dx)}} - \frac{3i\cos^2(c+dx)\sqrt{a+ia\tan(c+dx)}}{4d(e\cos(c+dx))^{5/2}} -$$

$$= -\frac{3i\sqrt{a}\,e^{5/2}\log\left(a - \frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}} + \cos(c+dx)(a+ia\tan(c+dx))\right)}{8\sqrt{2}\,d(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}} + \text{–} \quad 3$$

$$= \frac{3i\sqrt{a}\,e^{5/2}\tan^{-1}\left(1 - \frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{4\sqrt{2}\,d(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}} - \frac{3i\sqrt{a}\,e^{5/2}\tan^{-1}\left(1 + \frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+d}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right.}{4\sqrt{2}\,d(e\cos(c+dx))^{5/2}(e\sec(c+dx)}$$

Mathematica [A] time = 2.42, size = 227, normalized size = 0.44

$$\frac{\sqrt{\cos(c+dx)}\sqrt{a+ia\tan(c+dx)}\left(-3i\cos^{\frac{3}{2}}(c+dx) + 2\sqrt{\cos(c+dx)}\,(\sin(c+dx)+i\cos(c+dx)) + \frac{3i\left(-e^{-2ic}\right)^{3/}}{\ }\right.}{4d(e\cos(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a + I*a*Tan[c + d*x]]/(e*Cos[c + d*x])^(5/2),x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*((((3*I)/4)*(-E^((-2*I)*c))^(3/4)*(1 + E^((2*I)*(c + d*
x)))^2*Sqrt[(1 + E^((2*I)*(c + d*x)))/E^(I*(c + d*x))]*(ArcTan[E^((I/2)*d*x
)/(-E^((-2*I)*c))^(1/4)] - ArcTanh[E^((I/2)*d*x)/(-E^((-2*I)*c))^(1/4)]))/(
Sqrt[2]*E^((I/2)*(2*c + 5*d*x))) - (3*I)*Cos[c + d*x]^(3/2) + 2*Sqrt[Cos[c
+ d*x]]*(I*Cos[c + d*x] + Sin[c + d*x]))*Sqrt[a + I*a*Tan[c + d*x]])/(4*d*(
e*Cos[c + d*x])^(5/2))
```

fricas [A] time = 0.71, size = 569, normalized size = 1.11

$$\frac{\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(-3i\,e^{(4i\,dx+4i\,c)} + i\,e^{(2i\,dx+2i\,c)}\right)e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)} - \left(de^3e^{(4i\,dx+4i\,c)} + 2\,de^3e^{(2i\,dx+2i\,c}\right.}{\ }$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*cos(d*x+c))^(5/2),x, algorithm="frica
s")
```

```
[Out] 1/2*(sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x +
 2*I*c) + 1))*(-3*I*e^(4*I*d*x + 4*I*c) + I*e^(2*I*d*x + 2*I*c))*e^(-1/2*I*
d*x - 1/2*I*c) - (d*e^3*e^(4*I*d*x + 4*I*c) + 2*d*e^3*e^(2*I*d*x + 2*I*c) +
 d*e^3)*sqrt(9/16*I*a/(d^2*e^5))*log(4/3*I*d*e^3*sqrt(9/16*I*a/(d^2*e^5)) +
 sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I
*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)) + (d*e^3*e^(4*I*d*x + 4*I*c) + 2*d*e^3*
e^(2*I*d*x + 2*I*c) + d*e^3)*sqrt(9/16*I*a/(d^2*e^5))*log(-4/3*I*d*e^3*sqrt
(9/16*I*a/(d^2*e^5)) + sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sq
rt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)) - (d*e^3*e^(4*I*d
*x + 4*I*c) + 2*d*e^3*e^(2*I*d*x + 2*I*c) + d*e^3)*sqrt(-9/16*I*a/(d^2*e^5)
)*log(4/3*I*d*e^3*sqrt(-9/16*I*a/(d^2*e^5)) + sqrt(2)*sqrt(1/2)*sqrt(e*e^(2
*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*
I*c)) + (d*e^3*e^(4*I*d*x + 4*I*c) + 2*d*e^3*e^(2*I*d*x + 2*I*c) + d*e^3)*s
qrt(-9/16*I*a/(d^2*e^5))*log(-4/3*I*d*e^3*sqrt(-9/16*I*a/(d^2*e^5)) + sqrt(
2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) +
1))*e^(-1/2*I*d*x - 1/2*I*c)))/(d*e^3*e^(4*I*d*x + 4*I*c) + 2*d*e^3*e^(2*I*
d*x + 2*I*c) + d*e^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{i\,a\tan\left(dx+c\right)+a}}{\left(e\cos\left(dx+c\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*cos(d*x+c))^(5/2),x, algorithm="giac"
)
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)/(e*cos(d*x + c))^(5/2), x)
```

maple [A] time = 1.55, size = 366, normalized size = 0.71

$$-\frac{\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\ \cos\left(dx+c\right)\left(-1+\cos\left(dx+c\right)\right)^{3}\left(3i\left(\cos^{2}\left(dx+c\right)\right)\operatorname{arctanh}\left(\frac{\sqrt{\frac{1}{1+\cos(dx+c)}}\ (\cos(dx+c)+1+\sin(d}{2}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^(1/2)/(e*cos(d*x+c))^(5/2),x)
```

```
[Out] -1/8/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*cos(d*x+c)*(-1+cos(d*
x+c))^3*(3*I*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+
1+sin(d*x+c)))+3*I*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(-cos(
d*x+c)-1+sin(d*x+c)))+6*I*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)+6*
cos(d*x+c)^2*(1/(1+cos(d*x+c)))^(1/2)-3*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos(
d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+3*cos(d*x+c)^2*arctanh(1/2*(1/(1+
cos(d*x+c)))^(1/2)*(-cos(d*x+c)-1+sin(d*x+c)))+4*I*(1/(1+cos(d*x+c)))^(1/2)
*sin(d*x+c)+2*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)-4*(1/(1+cos(d*x+c)))^(1/2
))/sin(d*x+c)^5/(I*sin(d*x+c)+cos(d*x+c)-1)/(1/(1+cos(d*x+c)))^(5/2)/(e*cos
(d*x+c))^(5/2)
```

maxima [B] time = 1.27, size = 2265, normalized size = 4.42

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*cos(d*x+c))^(5/2),x, algorithm="maxim
a")
```

[Out] -((192*sqrt(2)*cos(4*d*x + 4*c) + 384*sqrt(2)*cos(2*d*x + 2*c) + 192*I*sqrt
(2)*sin(4*d*x + 4*c) + 384*I*sqrt(2)*sin(2*d*x + 2*c) + 192*sqrt(2))*arctan
2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1, sqrt(2)
*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (192*sqrt(2)*c
os(4*d*x + 4*c) + 384*sqrt(2)*cos(2*d*x + 2*c) + 192*I*sqrt(2)*sin(4*d*x +
4*c) + 384*I*sqrt(2)*sin(2*d*x + 2*c) + 192*sqrt(2))*arctan2(sqrt(2)*cos(1/
4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1, -sqrt(2)*sin(1/4*arctan
2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (192*sqrt(2)*cos(4*d*x + 4*c)
 + 384*sqrt(2)*cos(2*d*x + 2*c) + 192*I*sqrt(2)*sin(4*d*x + 4*c) + 384*I*sq
rt(2)*sin(2*d*x + 2*c) + 192*sqrt(2))*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c))) - 1, sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*
c), cos(2*d*x + 2*c))) + 1) + (192*sqrt(2)*cos(4*d*x + 4*c) + 384*sqrt(2)*c
os(2*d*x + 2*c) + 192*I*sqrt(2)*sin(4*d*x + 4*c) + 384*I*sqrt(2)*sin(2*d*x
+ 2*c) + 192*sqrt(2))*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c))) - 1, -sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
 2*c))) + 1) - (192*I*sqrt(2)*cos(4*d*x + 4*c) + 384*I*sqrt(2)*cos(2*d*x +
2*c) - 192*sqrt(2)*sin(4*d*x + 4*c) - 384*sqrt(2)*sin(2*d*x + 2*c) + 192*I*
sqrt(2))*arctan2(sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
)) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))), sqrt(2)*cos(1/4*
arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x +
2*c), cos(2*d*x + 2*c))) + 1) - (-192*I*sqrt(2)*cos(4*d*x + 4*c) - 384*I*sq
rt(2)*cos(2*d*x + 2*c) + 192*sqrt(2)*sin(4*d*x + 4*c) + 384*sqrt(2)*sin(2*d
*x + 2*c) - 192*I*sqrt(2))*arctan2(-sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c
), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))
), -sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*
arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (96*sqrt(2)*cos(4*d*x +
 4*c) + 192*sqrt(2)*cos(2*d*x + 2*c) + 96*I*sqrt(2)*sin(4*d*x + 4*c) + 192*
I*sqrt(2)*sin(2*d*x + 2*c) + 96*sqrt(2))*log(2*sqrt(2)*sin(1/2*arctan2(sin(
2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*
x + 2*c))) + 2*(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))
) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arcta
n2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*cos(1/4*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2
*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt
(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (96*sqrt(2)
*cos(4*d*x + 4*c) + 192*sqrt(2)*cos(2*d*x + 2*c) + 96*I*sqrt(2)*sin(4*d*x +
 4*c) + 192*I*sqrt(2)*sin(2*d*x + 2*c) + 96*sqrt(2))*log(-2*sqrt(2)*sin(1/2
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/4*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c))) - 2*(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(
2*d*x + 2*c))) - 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) +
cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*cos(1/4*arctan2(
sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c),
cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1)
- (-96*I*sqrt(2)*cos(4*d*x + 4*c) - 192*I*sqrt(2)*cos(2*d*x + 2*c) + 96*sqr
t(2)*sin(4*d*x + 4*c) + 192*sqrt(2)*sin(2*d*x + 2*c) - 96*I*sqrt(2))*log(2*
cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(
sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*
x + 2*c), cos(2*d*x + 2*c))) + 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c),
cos(2*d*x + 2*c))) + 2) - (96*I*sqrt(2)*cos(4*d*x + 4*c) + 192*I*sqrt(2)*co
s(2*d*x + 2*c) - 96*sqrt(2)*sin(4*d*x + 4*c) - 192*sqrt(2)*sin(2*d*x + 2*c)
 + 96*I*sqrt(2))*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt(2)*c
os(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 2*sqrt(2)*sin(1/4*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) - (-96*I*sqrt(2)*cos(4*d*x +
 4*c) - 192*I*sqrt(2)*cos(2*d*x + 2*c) + 96*sqrt(2)*sin(4*d*x + 4*c) + 192*
sqrt(2)*sin(2*d*x + 2*c) - 96*I*sqrt(2))*log(2*cos(1/4*arctan2(sin(2*d*x +
2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x
+ 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))

```
 + 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) - (9
6*I*sqrt(2)*cos(4*d*x + 4*c) + 192*I*sqrt(2)*cos(2*d*x + 2*c) - 96*sqrt(2)*
sin(4*d*x + 4*c) - 192*sqrt(2)*sin(2*d*x + 2*c) + 96*I*sqrt(2))*log(2*cos(1
/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c))) - 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c))) + 2) + 1536*cos(7/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c
))) - 512*cos(3/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1536*I*sin
(7/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 512*I*sin(3/4*arctan2(s
in(2*d*x + 2*c), cos(2*d*x + 2*c))))*sqrt(a)*sqrt(e)/((-1024*I*e^3*cos(4*d*
x + 4*c) - 2048*I*e^3*cos(2*d*x + 2*c) + 1024*e^3*sin(4*d*x + 4*c) + 2048*e
^3*sin(2*d*x + 2*c) - 1024*I*e^3)*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\sqrt{a+a\tan(c+dx)\,1\mathrm{i}}}{(e\cos(c+dx))^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(1/2)/(e*cos(c + d*x))^(5/2),x)
```

```
[Out] int((a + a*tan(c + d*x)*1i)^(1/2)/(e*cos(c + d*x))^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**(1/2)/(e*cos(d*x+c))**(5/2),x)
```

```
[Out] Timed out
```

3.680 $\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\cos(c+dx))^{7/2}}\,dx$

Optimal. Leaf size=719

$$-\frac{5ia^{3/2}e^{7/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{8\sqrt{2}\,d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}\,(e\cos(c+dx))^{7/2}(e\sec(c+dx))^{7/2}}+\frac{5ia^{3/2}e^{7/2}\mathrm{sec}}{8\sqrt{2}\,d\sqrt{a-ia\tan(c+dx)}}$$

```
[Out] 1/3*I*a/d/(e*cos(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^(1/2)+5/8*I*a*cos(d*x+c)^
2/d/(e*cos(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^(1/2)-5/16*I*a^(3/2)*e^(7/2)*ar
ctan(1-2^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*sec(d*x+c))^(1/2
))*sec(d*x+c)/d/(e*cos(d*x+c))^(7/2)/(e*sec(d*x+c))^(7/2)*2^(1/2)/(a-I*a*ta
n(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)+5/16*I*a^(3/2)*e^(7/2)*arctan(1+2^
(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*sec(d*x+c))^(1/2))*sec(d*
x+c)/d/(e*cos(d*x+c))^(7/2)/(e*sec(d*x+c))^(7/2)*2^(1/2)/(a-I*a*tan(d*x+c))
^(1/2)/(a+I*a*tan(d*x+c))^(1/2)+5/32*I*a^(3/2)*e^(7/2)*ln(a-2^(1/2)*a^(1/2)
*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2)+cos(d*x+c)*(a-I*a*ta
n(d*x+c)))*sec(d*x+c)/d/(e*cos(d*x+c))^(7/2)/(e*sec(d*x+c))^(7/2)*2^(1/2)/(
a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)-5/32*I*a^(3/2)*e^(7/2)*ln(
a+2^(1/2)*a^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2)+cos
(d*x+c)*(a-I*a*tan(d*x+c)))*sec(d*x+c)/d/(e*cos(d*x+c))^(7/2)/(e*sec(d*x+c)
)^(7/2)*2^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)-5/12*I*co
s(d*x+c)^2*(a+I*a*tan(d*x+c))^(1/2)/d/(e*cos(d*x+c))^(7/2)
```

Rubi [A] time = 0.86, antiderivative size = 719, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 11, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.367, Rules used = {3515, 3498, 3501, 3499, 3495, 297, 1162, 617, 204, 1165, 628}

$$-\frac{5ia^{3/2}e^{7/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{8\sqrt{2}\,d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}\,(e\cos(c+dx))^{7/2}(e\sec(c+dx))^{7/2}}+\frac{5ia^{3/2}e^{7/2}\mathrm{sec}}{8\sqrt{2}\,d\sqrt{a-ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[a + I*a*Tan[c + d*x]]/(e*Cos[c + d*x])^(7/2),x]
```

```
[Out] ((I/3)*a)/(d*(e*Cos[c + d*x])^(7/2)*Sqrt[a + I*a*Tan[c + d*x]]) + (((5*I)/8
)*a*Cos[c + d*x]^2)/(d*(e*Cos[c + d*x])^(7/2)*Sqrt[a + I*a*Tan[c + d*x]]) -
 (((5*I)/8)*a^(3/2)*e^(7/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e]*Sqrt[a - I*a*Tan[c
+ d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])]*Sec[c + d*x])/(Sqrt[2]*d*(e*Cos[c
+ d*x])^(7/2)*(e*Sec[c + d*x])^(7/2)*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*
a*Tan[c + d*x]]) + (((5*I)/8)*a^(3/2)*e^(7/2)*ArcTan[1 + (Sqrt[2]*Sqrt[e]*S
qrt[a - I*a*Tan[c + d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])]*Sec[c + d*x])/(S
qrt[2]*d*(e*Cos[c + d*x])^(7/2)*(e*Sec[c + d*x])^(7/2)*Sqrt[a - I*a*Tan[c +
 d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) + (((5*I)/16)*a^(3/2)*e^(7/2)*Log[a - (S
qrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + C
os[c + d*x]*(a - I*a*Tan[c + d*x])]*Sec[c + d*x])/(Sqrt[2]*d*(e*Cos[c + d*x
])^(7/2)*(e*Sec[c + d*x])^(7/2)*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan
[c + d*x]]) - (((5*I)/16)*a^(3/2)*e^(7/2)*Log[a + (Sqrt[2]*Sqrt[a]*Sqrt[e]*
Sqrt[a - I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a - I*a*Ta
n[c + d*x])]*Sec[c + d*x])/(Sqrt[2]*d*(e*Cos[c + d*x])^(7/2)*(e*Sec[c + d*x
])^(7/2)*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) - (((5*I)/1
2)*Cos[c + d*x]^2*Sqrt[a + I*a*Tan[c + d*x]])/(d*(e*Cos[c + d*x])^(7/2))
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
```

```
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3495

```
Int[Sqrt[(d_.)*sec[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[(-4*b*d^2)/f, Subst[Int[x^2/(a^2 + d^2*x^4), x],
 x, Sqrt[a + b*Tan[e + f*x]]/Sqrt[d*Sec[e + f*x]]], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3498

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m}, x] && EqQ[a^2 + b^2, 0] && GtQ[n, 0] && NeQ[m + n - 1, 0] && IntegersQ[
2*m, 2*n]
```

Rule 3499

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(3/2)/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_
.)*(x_)]], x_Symbol] :> Dist[(d*Sec[e + f*x])/(Sqrt[a - b*Tan[e + f*x]]*Sqr
t[a + b*Tan[e + f*x]]), Int[Sqrt[d*Sec[e + f*x]]*Sqrt[a - b*Tan[e + f*x]],
```

```
x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rubi steps

$$\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\cos(c+dx))^{7/2}}\,dx = \frac{\int (e\sec(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}\,dx}{(e\cos(c+dx))^{7/2}(e\sec(c+dx))^{7/2}}$$

$$= \frac{ia}{3d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}} + \frac{(5a)\int \frac{(e\sec(c+dx))^{7/2}}{\sqrt{a+ia\tan(c+dx)}}\,dx}{6(e\cos(c+dx))^{7/2}(e\sec(c+dx))^{7/2}}$$

$$= \frac{ia}{3d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}} - \frac{5i\cos^2(c+dx)\sqrt{a+ia\tan(c+dx)}}{12d(e\cos(c+dx))^{7/2}} +$$

$$= \frac{ia}{3d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}} + \frac{5ia\cos^2(c+dx)}{8d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+d}}$$

$$= \frac{ia}{3d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}} + \frac{5ia\cos^2(c+dx)}{8d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+d}}$$

$$= \frac{ia}{3d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}} + \frac{5ia\cos^2(c+dx)}{8d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+d}}$$

$$= \frac{ia}{3d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}} + \frac{5ia\cos^2(c+dx)}{8d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+d}}$$

$$= \frac{ia}{3d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}} + \frac{5ia\cos^2(c+dx)}{8d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+d}}$$

$$= \frac{ia}{3d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}} + \frac{5ia\cos^2(c+dx)}{8d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+d}}$$

$$= \frac{ia}{3d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}} + \frac{5ia\cos^2(c+dx)}{8d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+d}}$$

Mathematica [A] time = 2.96, size = 305, normalized size = 0.42

$$\sqrt{\cos(c+dx)}\,\sqrt{a+ia\tan(c+dx)}\,\left(-\frac{40}{3}i\cos^{\frac{3}{2}}(c+dx)+\frac{5}{8}ie^{-\frac{7}{2}i(c+dx)}\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}\left(1+e^{2i(c+dx)}\right)^3\left(\log\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[a + I*a*Tan[c + d*x]]/(e*Cos[c + d*x])^(7/2),x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*(((-40*I)/3)*Cos[c + d*x]^(3/2) + (((5*I)/8)*(1 + E^((2
*I)*(c + d*x)))^3*Sqrt[(1 + E^((2*I)*(c + d*x)))/E^(I*(c + d*x))]*(2*ArcTan
[1 - Sqrt[2]*E^((I/2)*(c + d*x))] - 2*ArcTan[1 + Sqrt[2]*E^((I/2)*(c + d*x)
)] + Log[1 - Sqrt[2]*E^((I/2)*(c + d*x)) + E^(I*(c + d*x))] - Log[1 + Sqrt[
2]*E^((I/2)*(c + d*x)) + E^(I*(c + d*x))]))/E^(((7*I)/2)*(c + d*x)) + (32*S
qrt[Cos[c + d*x]]*(I*Cos[c + d*x] + Sin[c + d*x]))/3 + 20*Cos[c + d*x]^(5/2
)*(I*Cos[c + d*x] + Sin[c + d*x]))*Sqrt[a + I*a*Tan[c + d*x]])/(32*d*(e*Cos
[c + d*x])^(7/2))
```

fricas [A] time = 0.48, size = 657, normalized size = 0.91

$$\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(-5i\,e^{(5i\,dx+5i\,c)}+42i\,e^{(3i\,dx+3i\,c)}+15i\,e^{(i\,dx+i\,c)}\right)e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}-6\left(de^{4}e^{(6i\,dx+6i\,c)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*cos(d*x+c))^(7/2),x, algorithm="frica
s")
```

```
[Out] 1/12*(sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x
+ 2*I*c) + 1))*(-5*I*e^(5*I*d*x + 5*I*c) + 42*I*e^(3*I*d*x + 3*I*c) + 15*I*
e^(I*d*x + I*c))*e^(-1/2*I*d*x - 1/2*I*c) - 6*(d*e^4*e^(6*I*d*x + 6*I*c) +
3*d*e^4*e^(4*I*d*x + 4*I*c) + 3*d*e^4*e^(2*I*d*x + 2*I*c) + d*e^4)*sqrt(25/
64*I*a/(d^2*e^7))*log(8/5*d*e^4*sqrt(25/64*I*a/(d^2*e^7)) + sqrt(2)*sqrt(1/
2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/
2*I*d*x - 1/2*I*c)) + 6*(d*e^4*e^(6*I*d*x + 6*I*c) + 3*d*e^4*e^(4*I*d*x + 4
*I*c) + 3*d*e^4*e^(2*I*d*x + 2*I*c) + d*e^4)*sqrt(25/64*I*a/(d^2*e^7))*log(
-8/5*d*e^4*sqrt(25/64*I*a/(d^2*e^7)) + sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x
+ 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)) +
 6*(d*e^4*e^(6*I*d*x + 6*I*c) + 3*d*e^4*e^(4*I*d*x + 4*I*c) + 3*d*e^4*e^(2*
I*d*x + 2*I*c) + d*e^4)*sqrt(-25/64*I*a/(d^2*e^7))*log(8/5*d*e^4*sqrt(-25/6
4*I*a/(d^2*e^7)) + sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a
/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)) - 6*(d*e^4*e^(6*I*d*x
 + 6*I*c) + 3*d*e^4*e^(4*I*d*x + 4*I*c) + 3*d*e^4*e^(2*I*d*x + 2*I*c) + d*e
^4)*sqrt(-25/64*I*a/(d^2*e^7))*log(-8/5*d*e^4*sqrt(-25/64*I*a/(d^2*e^7)) +
sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*
c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)))/(d*e^4*e^(6*I*d*x + 6*I*c) + 3*d*e^4*e^
(4*I*d*x + 4*I*c) + 3*d*e^4*e^(2*I*d*x + 2*I*c) + d*e^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{i\,a\tan\left(dx+c\right)+a}}{\left(e\cos\left(dx+c\right)\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*cos(d*x+c))^(7/2),x, algorithm="giac"
)
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)/(e*cos(d*x + c))^(7/2), x)
```

maple [A] time = 1.49, size = 417, normalized size = 0.58

$$\frac{\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\,\cos(dx+c)\,(-1+\cos(dx+c))^4\left(15i\left(\cos^3(dx+c)\right)\operatorname{arctanh}\left(\frac{\sqrt{\frac{1}{1+\cos(dx+c)}}\,(-\cos(dx+c)-1+}{2}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+I*a*tan(d*x+c))^(1/2)/(e*cos(d*x+c))^(7/2),x)
```

```
[Out] 1/48/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*cos(d*x+c)*(-1+cos(d*
x+c))^4*(15*I*cos(d*x+c)^3*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(-cos(d*x+c
)-1+sin(d*x+c)))+15*I*cos(d*x+c)^3*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(co
s(d*x+c)+1+sin(d*x+c)))+30*I*cos(d*x+c)^2*(1/(1+cos(d*x+c)))^(1/2)*sin(d*x+
c)+20*I*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)-15*cos(d*x+c)^3*arct
anh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(-cos(d*x+c)-1+sin(d*x+c)))+15*cos(d*x+c)^
3*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))-30*cos(d*
x+c)^3*(1/(1+cos(d*x+c)))^(1/2)+16*I*(1/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)-10
*cos(d*x+c)^2*(1/(1+cos(d*x+c)))^(1/2)+4*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2
)-16*(1/(1+cos(d*x+c)))^(1/2))/sin(d*x+c)^7/(I*sin(d*x+c)+cos(d*x+c)-1)/(1/
(1+cos(d*x+c)))^(7/2)/(e*cos(d*x+c))^(7/2)
```

maxima [B] time = 1.45, size = 2671, normalized size = 3.71

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))^(1/2)/(e*cos(d*x+c))^(7/2),x, algorithm="maxim
a")
```

```
[Out] -((5760*sqrt(2)*cos(6*d*x + 6*c) + 17280*sqrt(2)*cos(4*d*x + 4*c) + 17280*s
qrt(2)*cos(2*d*x + 2*c) + 5760*I*sqrt(2)*sin(6*d*x + 6*c) + 17280*I*sqrt(2)
*sin(4*d*x + 4*c) + 17280*I*sqrt(2)*sin(2*d*x + 2*c) + 5760*sqrt(2))*arctan
2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1, sqrt(2)
*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (5760*sqrt(2)*
cos(6*d*x + 6*c) + 17280*sqrt(2)*cos(4*d*x + 4*c) + 17280*sqrt(2)*cos(2*d*x
 + 2*c) + 5760*I*sqrt(2)*sin(6*d*x + 6*c) + 17280*I*sqrt(2)*sin(4*d*x + 4*c
) + 17280*I*sqrt(2)*sin(2*d*x + 2*c) + 5760*sqrt(2))*arctan2(sqrt(2)*cos(1/
4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1, -sqrt(2)*sin(1/4*arctan
2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (5760*sqrt(2)*cos(6*d*x + 6*c
) + 17280*sqrt(2)*cos(4*d*x + 4*c) + 17280*sqrt(2)*cos(2*d*x + 2*c) + 5760*
I*sqrt(2)*sin(6*d*x + 6*c) + 17280*I*sqrt(2)*sin(4*d*x + 4*c) + 17280*I*sqr
t(2)*sin(2*d*x + 2*c) + 5760*sqrt(2))*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c))) - 1, sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*
c), cos(2*d*x + 2*c))) + 1) + (5760*sqrt(2)*cos(6*d*x + 6*c) + 17280*sqrt(2
)*cos(4*d*x + 4*c) + 17280*sqrt(2)*cos(2*d*x + 2*c) + 5760*I*sqrt(2)*sin(6*
d*x + 6*c) + 17280*I*sqrt(2)*sin(4*d*x + 4*c) + 17280*I*sqrt(2)*sin(2*d*x +
 2*c) + 5760*sqrt(2))*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c))) - 1, -sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
 2*c))) + 1) + (5760*I*sqrt(2)*cos(6*d*x + 6*c) + 17280*I*sqrt(2)*cos(4*d*x
 + 4*c) + 17280*I*sqrt(2)*cos(2*d*x + 2*c) - 5760*sqrt(2)*sin(6*d*x + 6*c)
- 17280*sqrt(2)*sin(4*d*x + 4*c) - 17280*sqrt(2)*sin(2*d*x + 2*c) + 5760*I*
sqrt(2))*arctan2(sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
)) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))), sqrt(2)*cos(1/4*
arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x +
2*c), cos(2*d*x + 2*c))) + 1) + (-5760*I*sqrt(2)*cos(6*d*x + 6*c) - 17280*I
*sqrt(2)*cos(4*d*x + 4*c) - 17280*I*sqrt(2)*cos(2*d*x + 2*c) + 5760*sqrt(2)
```

```
*sin(6*d*x + 6*c) + 17280*sqrt(2)*sin(4*d*x + 4*c) + 17280*sqrt(2)*sin(2*d*
x + 2*c) - 5760*I*sqrt(2))*arctan2(-sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c
), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))
), -sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*
arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (2880*sqrt(2)*cos(6*d*x
 + 6*c) + 8640*sqrt(2)*cos(4*d*x + 4*c) + 8640*sqrt(2)*cos(2*d*x + 2*c) + 2
880*I*sqrt(2)*sin(6*d*x + 6*c) + 8640*I*sqrt(2)*sin(4*d*x + 4*c) + 8640*I*s
qrt(2)*sin(2*d*x + 2*c) + 2880*sqrt(2))*log(2*sqrt(2)*sin(1/2*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x
 + 2*c))) + 2*(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
 + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arctan
2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*cos(1/4*arctan2(sin(2*d*x + 2*
c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*
c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt(
2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (2880*sqrt(2
)*cos(6*d*x + 6*c) + 8640*sqrt(2)*cos(4*d*x + 4*c) + 8640*sqrt(2)*cos(2*d*x
 + 2*c) + 2880*I*sqrt(2)*sin(6*d*x + 6*c) + 8640*I*sqrt(2)*sin(4*d*x + 4*c)
 + 8640*I*sqrt(2)*sin(2*d*x + 2*c) + 2880*sqrt(2))*log(-2*sqrt(2)*sin(1/2*a
rctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/4*arctan2(sin(2*d*x + 2*c
), cos(2*d*x + 2*c))) - 2*(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*
d*x + 2*c))) - 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + co
s(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*cos(1/4*arctan2(si
n(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), co
s(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) +
(2880*I*sqrt(2)*cos(6*d*x + 6*c) + 8640*I*sqrt(2)*cos(4*d*x + 4*c) + 8640*I
*sqrt(2)*cos(2*d*x + 2*c) - 2880*sqrt(2)*sin(6*d*x + 6*c) - 8640*sqrt(2)*si
n(4*d*x + 4*c) - 8640*sqrt(2)*sin(2*d*x + 2*c) + 2880*I*sqrt(2))*log(2*cos(
1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(
2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x +
2*c), cos(2*d*x + 2*c))) + 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(
2*d*x + 2*c))) + 2) + (-2880*I*sqrt(2)*cos(6*d*x + 6*c) - 8640*I*sqrt(2)*co
s(4*d*x + 4*c) - 8640*I*sqrt(2)*cos(2*d*x + 2*c) + 2880*sqrt(2)*sin(6*d*x +
 6*c) + 8640*sqrt(2)*sin(4*d*x + 4*c) + 8640*sqrt(2)*sin(2*d*x + 2*c) - 288
0*I*sqrt(2))*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 +
 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt(2)*cos(1
/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 2*sqrt(2)*sin(1/4*arctan2
(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) + (2880*I*sqrt(2)*cos(6*d*x + 6*
c) + 8640*I*sqrt(2)*cos(4*d*x + 4*c) + 8640*I*sqrt(2)*cos(2*d*x + 2*c) - 28
80*sqrt(2)*sin(6*d*x + 6*c) - 8640*sqrt(2)*sin(4*d*x + 4*c) - 8640*sqrt(2)*
sin(2*d*x + 2*c) + 2880*I*sqrt(2))*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c),
cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2*s
qrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) + (-2880*I
*sqrt(2)*cos(6*d*x + 6*c) - 8640*I*sqrt(2)*cos(4*d*x + 4*c) - 8640*I*sqrt(2
)*cos(2*d*x + 2*c) + 2880*sqrt(2)*sin(6*d*x + 6*c) + 8640*sqrt(2)*sin(4*d*x
 + 4*c) + 8640*sqrt(2)*sin(2*d*x + 2*c) - 2880*I*sqrt(2))*log(2*cos(1/4*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x +
 2*c), cos(2*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), c
os(2*d*x + 2*c))) - 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
 2*c))) + 2) + 15360*cos(9/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) -
 129024*cos(5/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 46080*cos(1/
4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 15360*I*sin(9/4*arctan2(si
n(2*d*x + 2*c), cos(2*d*x + 2*c))) - 129024*I*sin(5/4*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c))) - 46080*I*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d
*x + 2*c))))*sqrt(a)*sqrt(e)/((-36864*I*e^4*cos(6*d*x + 6*c) - 110592*I*e^4
*cos(4*d*x + 4*c) - 110592*I*e^4*cos(2*d*x + 2*c) + 36864*e^4*sin(6*d*x + 6
*c) + 110592*e^4*sin(4*d*x + 4*c) + 110592*e^4*sin(2*d*x + 2*c) - 36864*I*e
^4)*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\sqrt{a+a\tan\left(c+d\,x\right)\,1\mathrm{i}}}{{\left(e\,\cos\left(c+d\,x\right)\right)}^{7/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + a*tan(c + d*x)*1i)^(1/2)/(e*cos(c + d*x))^(7/2),x)
[Out] int((a + a*tan(c + d*x)*1i)^(1/2)/(e*cos(c + d*x))^(7/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+I*a*tan(d*x+c))**(1/2)/(e*cos(d*x+c))**(7/2),x)
[Out] Timed out
```

3.681 $\int \frac{(e\cos(c+dx))^{5/2}}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=175

$$-\frac{12i\sqrt{a+ia\tan(c+dx)}\,(e\cos(c+dx))^{5/2}}{35ad}+\frac{2i(e\cos(c+dx))^{5/2}}{7d\sqrt{a+ia\tan(c+dx)}}-\frac{32i\sec^2(c+dx)\sqrt{a+ia\tan(c+dx)}\,(e\cos(c}{35ad}$$

```
[Out] 2/7*I*(e*cos(d*x+c))^(5/2)/d/(a+I*a*tan(d*x+c))^(1/2)+16/35*I*(e*cos(d*x+c)
)^(5/2)*sec(d*x+c)^2/d/(a+I*a*tan(d*x+c))^(1/2)-12/35*I*(e*cos(d*x+c))^(5/2
)*(a+I*a*tan(d*x+c))^(1/2)/a/d-32/35*I*(e*cos(d*x+c))^(5/2)*sec(d*x+c)^2*(a
+I*a*tan(d*x+c))^(1/2)/a/d
```

Rubi [A] time = 0.38, antiderivative size = 175, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {3515, 3502, 3497, 3488}

$$-\frac{12i\sqrt{a+ia\tan(c+dx)}\,(e\cos(c+dx))^{5/2}}{35ad}+\frac{2i(e\cos(c+dx))^{5/2}}{7d\sqrt{a+ia\tan(c+dx)}}-\frac{32i\sec^2(c+dx)\sqrt{a+ia\tan(c+dx)}\,(e\cos(c}{35ad}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cos[c + d*x])^(5/2)/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((2*I)/7)*(e*Cos[c + d*x])^(5/2))/(d*Sqrt[a + I*a*Tan[c + d*x]]) + (((16*I
)/35)*(e*Cos[c + d*x])^(5/2)*Sec[c + d*x]^2)/(d*Sqrt[a + I*a*Tan[c + d*x]])
 - (((12*I)/35)*(e*Cos[c + d*x])^(5/2)*Sqrt[a + I*a*Tan[c + d*x]])/(a*d) -
(((32*I)/35)*(e*Cos[c + d*x])^(5/2)*Sec[c + d*x]^2*Sqrt[a + I*a*Tan[c + d*x
]])/(a*d)
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rubi steps

$$\int \frac{(e\cos(c+dx))^{5/2}}{\sqrt{a+ia\tan(c+dx)}}\,dx = \left((e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}\right)\int \frac{1}{(e\sec(c+dx))^{5/2}\sqrt{a+ia\tan(c+dx)}}\,dx$$

$$= \frac{2i(e\cos(c+dx))^{5/2}}{7d\sqrt{a+ia\tan(c+dx)}} + \frac{\left(6(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}\right)\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\sec(c+dx))^{5/2}}\,c}{7a}$$

$$= \frac{2i(e\cos(c+dx))^{5/2}}{7d\sqrt{a+ia\tan(c+dx)}} - \frac{12i(e\cos(c+dx))^{5/2}\sqrt{a+ia\tan(c+dx)}}{35ad} + \frac{(24(e\cos(c}{}$$

$$= \frac{2i(e\cos(c+dx))^{5/2}}{7d\sqrt{a+ia\tan(c+dx)}} + \frac{16i(e\cos(c+dx))^{5/2}\sec^2(c+dx)}{35d\sqrt{a+ia\tan(c+dx)}} - \frac{12i(e\cos(c+dx))^{5}}{3}$$

$$= \frac{2i(e\cos(c+dx))^{5/2}}{7d\sqrt{a+ia\tan(c+dx)}} + \frac{16i(e\cos(c+dx))^{5/2}\sec^2(c+dx)}{35d\sqrt{a+ia\tan(c+dx)}} - \frac{12i(e\cos(c+dx))^{5}}{3}$$

Mathematica [A] time = 0.65, size = 80, normalized size = 0.46

$$-\frac{ie^3(70i\sin(c+dx)+6i\sin(3(c+dx))+35\cos(c+dx)+\cos(3(c+dx)))}{70d\sqrt{a+ia\tan(c+dx)}\sqrt{e\cos(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cos[c + d*x])^(5/2)/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((-1/70*I)*e^3*(35*Cos[c + d*x] + Cos[3*(c + d*x)] + (70*I)*Sin[c + d*x] +
(6*I)*Sin[3*(c + d*x)]))/(d*Sqrt[e*Cos[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]
)
```

fricas [A] time = 0.49, size = 103, normalized size = 0.59

$$\frac{\sqrt{2}\sqrt{\frac{1}{2}}\left(-7i\,e^2e^{(6i\,dx+6i\,c)}-105i\,e^2e^{(4i\,dx+4i\,c)}+35i\,e^2e^{(2i\,dx+2i\,c)}+5i\,e^2\right)\sqrt{ee^{(2i\,dx+2i\,c)}+e}\,\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{7}{2}i\,dx-\frac{7}{2}i\,c\right)}}{140\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="frica
s")
```

```
[Out] 1/140*sqrt(2)*sqrt(1/2)*(-7*I*e^2*e^(6*I*d*x + 6*I*c) - 105*I*e^2*e^(4*I*d*
x + 4*I*c) + 35*I*e^2*e^(2*I*d*x + 2*I*c) + 5*I*e^2)*sqrt(e*e^(2*I*d*x + 2*
I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(-7/2*I*d*x - 7/2*I*c)/(a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cos(dx+c))^{\frac{5}{2}}}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] integrate((e*cos(d*x + c))^(5/2)/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [A] time = 1.39, size = 110, normalized size = 0.63

$$\frac{2\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\,(e\cos(dx+c))^{\frac{5}{2}}\left(5i\left(\cos^4(dx+c)\right)+5\left(\cos^3(dx+c)\right)\sin(dx+c)+2i\left(\cos^2(dx+c)\right)+\right.}{35d\cos(dx+c)^2 a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 2/35/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(e*cos(d*x+c))^(5/2)*
(5*I*cos(d*x+c)^4+5*cos(d*x+c)^3*sin(d*x+c)+2*I*cos(d*x+c)^2+8*cos(d*x+c)*s
in(d*x+c)-16*I)/cos(d*x+c)^2/a
```

maxima [A] time = 1.42, size = 202, normalized size = 1.15

$$\left(5ie^2\cos\left(\frac{7}{2}dx+\frac{7}{2}c\right)-7ie^2\cos\left(\frac{5}{7}\arctan\left(\sin\left(\frac{7}{2}dx+\frac{7}{2}c\right),\cos\left(\frac{7}{2}dx+\frac{7}{2}c\right)\right)\right)+35ie^2\cos\left(\frac{3}{7}\arctan\left(\sin\left(\frac{7}{2}d\right.\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxim
a")
```

```
[Out] 1/140*(5*I*e^2*cos(7/2*d*x + 7/2*c) - 7*I*e^2*cos(5/7*arctan2(sin(7/2*d*x +
 7/2*c), cos(7/2*d*x + 7/2*c))) + 35*I*e^2*cos(3/7*arctan2(sin(7/2*d*x + 7/
2*c), cos(7/2*d*x + 7/2*c))) - 105*I*e^2*cos(1/7*arctan2(sin(7/2*d*x + 7/2*
c), cos(7/2*d*x + 7/2*c))) + 5*e^2*sin(7/2*d*x + 7/2*c) + 7*e^2*sin(5/7*arc
tan2(sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))) + 35*e^2*sin(3/7*arctan2(
sin(7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))) + 105*e^2*sin(1/7*arctan2(sin(
7/2*d*x + 7/2*c), cos(7/2*d*x + 7/2*c))))*sqrt(e)/(sqrt(a)*d)
```

mupad [B] time = 5.24, size = 110, normalized size = 0.63

$$\frac{e^2\sqrt{e\cos(c+dx)}\,\sqrt{\frac{a(\cos(2c+2dx)+1+\sin(2c+2dx)\,1\mathrm{i})}{\cos(2c+2dx)+1}}\,(\cos(2c+2dx)\,28\mathrm{i}+\cos(4c+4dx)\,5\mathrm{i}+42\sin(2c+2d\right.}{140\,a\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^(5/2)/(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] (e^2*(e*cos(c + d*x))^(1/2)*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1
))/(cos(2*c + 2*d*x) + 1))^(1/2)*(cos(2*c + 2*d*x)*28i + cos(4*c + 4*d*x)*5
i + 42*sin(2*c + 2*d*x) + 5*sin(4*c + 4*d*x) - 105i))/(140*a*d)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**(5/2)/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

3.682 $\int \frac{(e\cos(c+dx))^{3/2}}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=126

$$-\frac{8i\sqrt{a+ia\tan(c+dx)}\,(e\cos(c+dx))^{3/2}}{15ad}+\frac{2i(e\cos(c+dx))^{3/2}}{5d\sqrt{a+ia\tan(c+dx)}}+\frac{16i\sec^2(c+dx)(e\cos(c+dx))^{3/2}}{15d\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] 2/5*I*(e*cos(d*x+c))^(3/2)/d/(a+I*a*tan(d*x+c))^(1/2)+16/15*I*(e*cos(d*x+c)
)^(3/2)*sec(d*x+c)^2/d/(a+I*a*tan(d*x+c))^(1/2)-8/15*I*(e*cos(d*x+c))^(3/2)
*(a+I*a*tan(d*x+c))^(1/2)/a/d
```

Rubi [A] time = 0.31, antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.133, Rules used = {3515, 3502, 3497, 3488}

$$-\frac{8i\sqrt{a+ia\tan(c+dx)}\,(e\cos(c+dx))^{3/2}}{15ad}+\frac{2i(e\cos(c+dx))^{3/2}}{5d\sqrt{a+ia\tan(c+dx)}}+\frac{16i\sec^2(c+dx)(e\cos(c+dx))^{3/2}}{15d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cos[c + d*x])^(3/2)/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((2*I)/5)*(e*Cos[c + d*x])^(3/2))/(d*Sqrt[a + I*a*Tan[c + d*x]]) + (((16*I
)/15)*(e*Cos[c + d*x])^(3/2)*Sec[c + d*x]^2)/(d*Sqrt[a + I*a*Tan[c + d*x]])
 - (((8*I)/15)*(e*Cos[c + d*x])^(3/2)*Sqrt[a + I*a*Tan[c + d*x]])/(a*d)
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3497

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)/
(a*f*m), x] + Dist[(a*(m + n))/(m*d^2), Int[(d*Sec[e + f*x])^(m + 2)*(a + b
*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^
2, 0] && GtQ[n, 0] && LtQ[m, -1] && IntegersQ[2*m, 2*n]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rubi steps

$$\int \frac{(e\cos(c+dx))^{3/2}}{\sqrt{a+ia\tan(c+dx)}}\,dx = \left((e\cos(c+dx))^{3/2}(e\sec(c+dx))^{3/2}\right)\int \frac{1}{(e\sec(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}}\,dx$$
$$= \frac{2i(e\cos(c+dx))^{3/2}}{5d\sqrt{a+ia\tan(c+dx)}} + \frac{\left(4(e\cos(c+dx))^{3/2}(e\sec(c+dx))^{3/2}\right)\int \frac{\sqrt{a+ia\tan(c+dx)}}{(e\sec(c+dx))^{3/2}}\,dx}{5a}$$
$$= \frac{2i(e\cos(c+dx))^{3/2}}{5d\sqrt{a+ia\tan(c+dx)}} - \frac{8i(e\cos(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}}{15ad} + \frac{\left(8(e\cos(c+dx\right.}{}$$
$$= \frac{2i(e\cos(c+dx))^{3/2}}{5d\sqrt{a+ia\tan(c+dx)}} + \frac{16i(e\cos(c+dx))^{3/2}\sec^2(c+dx)}{15d\sqrt{a+ia\tan(c+dx)}} - \frac{8i(e\cos(c+dx))^{3/2}\sqrt{a}}{15ad}$$

Mathematica [A] time = 0.38, size = 63, normalized size = 0.50

$$-\frac{ie^2(4i\sin(2(c+dx))+\cos(2(c+dx))-15)}{15d\sqrt{a+ia\tan(c+dx)}\sqrt{e\cos(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(e*Cos[c + d*x])^(3/2)/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((-1/15*I)*e^2*(-15 + Cos[2*(c + d*x)] + (4*I)*Sin[2*(c + d*x)]))/(d*Sqrt[e
*Cos[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.55, size = 83, normalized size = 0.66

$$\frac{\sqrt{2}\sqrt{\frac{1}{2}}\left(-5i\,ee^{(4i\,dx+4i\,c)}+30i\,ee^{(2i\,dx+2i\,c)}+3i\,e\right)\sqrt{ee^{(2i\,dx+2i\,c)}+e}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{5}{2}i\,dx-\frac{5}{2}i\,c\right)}}{30\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="frica
s")
```

```
[Out] 1/30*sqrt(2)*sqrt(1/2)*(-5*I*e*e^(4*I*d*x + 4*I*c) + 30*I*e*e^(2*I*d*x + 2*
I*c) + 3*I*e)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) +
 1))*e^(-5/2*I*d*x - 5/2*I*c)/(a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cos(dx+c))^{\frac{3}{2}}}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] integrate((e*cos(d*x + c))^(3/2)/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [A] time = 1.52, size = 100, normalized size = 0.79

$$\frac{2\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\,(e\cos(dx+c))^{\frac{3}{2}}\left(3i\left(\cos^3(dx+c)\right)+3\left(\cos^2(dx+c)\right)\sin(dx+c)+4i\cos(dx+c)+8\,\mathrm{s}\right.}{15d\cos(dx+c)\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 2/15/d*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(e*cos(d*x+c))^(3/2)*
(3*I*cos(d*x+c)^3+3*cos(d*x+c)^2*sin(d*x+c)+4*I*cos(d*x+c)+8*sin(d*x+c))/co
s(d*x+c)/a
```

maxima [A] time = 1.19, size = 136, normalized size = 1.08

$$\frac{\left(3ie\cos\left(\frac{5}{2}\,dx+\frac{5}{2}\,c\right)-5ie\cos\left(\frac{3}{5}\,\arctan\left(\sin\left(\frac{5}{2}\,dx+\frac{5}{2}\,c\right),\cos\left(\frac{5}{2}\,dx+\frac{5}{2}\,c\right)\right)\right)+30ie\cos\left(\frac{1}{5}\,\arctan\left(\sin\left(\frac{5}{2}\,d\right.\right.\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxim
a")
```

```
[Out] 1/30*(3*I*e*cos(5/2*d*x + 5/2*c) - 5*I*e*cos(3/5*arctan2(sin(5/2*d*x + 5/2*
c), cos(5/2*d*x + 5/2*c))) + 30*I*e*cos(1/5*arctan2(sin(5/2*d*x + 5/2*c), c
os(5/2*d*x + 5/2*c))) + 3*e*sin(5/2*d*x + 5/2*c) + 5*e*sin(3/5*arctan2(sin(
5/2*d*x + 5/2*c), cos(5/2*d*x + 5/2*c))) + 30*e*sin(1/5*arctan2(sin(5/2*d*x
 + 5/2*c), cos(5/2*d*x + 5/2*c))))*sqrt(e)/(sqrt(a)*d)
```

mupad [B] time = 1.13, size = 100, normalized size = 0.79

$$\frac{e\sqrt{e\,\cos\left(c+d\,x\right)}\,\sqrt{\frac{a\,\left(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1\mathrm{i}\right)}{\cos(2\,c+2\,d\,x)+1}}\,\left(35\,\sin\left(c+d\,x\right)+3\,\sin\left(3\,c+3\,d\,x\right)+\cos\left(c+d\,x\right)\,25\mathrm{i}+\mathrm{c}\right.}{30\,a\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^(3/2)/(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] (e*(e*cos(c + d*x))^(1/2)*((a*(cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))
/(cos(2*c + 2*d*x) + 1))^(1/2)*(cos(c + d*x)*25i + 35*sin(c + d*x) + cos(3*
c + 3*d*x)*3i + 3*sin(3*c + 3*d*x)))/(30*a*d)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**(3/2)/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

3.683 $\int \frac{\sqrt{e\cos(c+dx)}}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=80

$$\frac{2i\sqrt{e\cos(c+dx)}}{3d\sqrt{a+ia\tan(c+dx)}}-\frac{4i\sqrt{a+ia\tan(c+dx)}\,\sqrt{e\cos(c+dx)}}{3ad}$$

```
[Out] 2/3*I*(e*cos(d*x+c))^(1/2)/d/(a+I*a*tan(d*x+c))^(1/2)-4/3*I*(e*cos(d*x+c))^
(1/2)*(a+I*a*tan(d*x+c))^(1/2)/a/d
```

Rubi [A] time = 0.21, antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {3515, 3502, 3488}

$$\frac{2i\sqrt{e\cos(c+dx)}}{3d\sqrt{a+ia\tan(c+dx)}}-\frac{4i\sqrt{a+ia\tan(c+dx)}\,\sqrt{e\cos(c+dx)}}{3ad}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[e*Cos[c + d*x]]/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (((2*I)/3)*Sqrt[e*Cos[c + d*x]])/(d*Sqrt[a + I*a*Tan[c + d*x]]) - (((4*I)/3
)*Sqrt[e*Cos[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]])/(a*d)
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3502

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(a*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(b*f*(m + 2*n)), x] + Dist[Simplify[m + n]/(a*(m + 2*n)), Int[(d*Sec[e + f
*x])^m*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[{a, b, d, e, f, m}, x]
 && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && NeQ[m + 2*n, 0] && IntegersQ[2*m, 2*n
]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{e\cos(c+dx)}}{\sqrt{a+ia\tan(c+dx)}}\,dx &= \left(\sqrt{e\cos(c+dx)}\,\sqrt{e\sec(c+dx)}\right)\int \frac{1}{\sqrt{e\sec(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}\,dx\\
&= \frac{2i\sqrt{e\cos(c+dx)}}{3d\sqrt{a+ia\tan(c+dx)}}+\frac{\left(2\sqrt{e\cos(c+dx)}\,\sqrt{e\sec(c+dx)}\right)\int \frac{\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}\,dx}{3a}\\
&= \frac{2i\sqrt{e\cos(c+dx)}}{3d\sqrt{a+ia\tan(c+dx)}}-\frac{4i\sqrt{e\cos(c+dx)}\,\sqrt{a+ia\tan(c+dx)}}{3ad}
\end{aligned}$$

Mathematica [A] time = 0.20, size = 48, normalized size = 0.60

$$\frac{2(2\tan(c+dx)-i)\sqrt{e\cos(c+dx)}}{3d\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[e*Cos[c + d*x]]/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (2*Sqrt[e*Cos[c + d*x]]*(-I + 2*Tan[c + d*x]))/(3*d*Sqrt[a + I*a*Tan[c + d*
x]])
```

fricas [A] time = 0.52, size = 68, normalized size = 0.85

$$\frac{\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(-3i\,e^{(2i\,dx+2i\,c)}+i\right)e^{\left(-\frac{3}{2}i\,dx-\frac{3}{2}i\,c\right)}}{3\,ad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="frica
s")
```

```
[Out] 1/3*sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x +
2*I*c) + 1))*(-3*I*e^(2*I*d*x + 2*I*c) + I)*e^(-3/2*I*d*x - 3/2*I*c)/(a*d)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\cos\left(dx+c\right)}}{\sqrt{i\,a\tan\left(dx+c\right)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac"
)
```

```
[Out] integrate(sqrt(e*cos(d*x + c))/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [A] time = 1.38, size = 74, normalized size = 0.92

$$\frac{2\sqrt{e\cos\left(dx+c\right)}\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(i\left(\cos^{2}\left(dx+c\right)\right)+\cos\left(dx+c\right)\sin\left(dx+c\right)-2i\right)}{3da}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 2/3/d*(e*cos(d*x+c))^(1/2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*(
I*cos(d*x+c)^2+cos(d*x+c)*sin(d*x+c)-2*I)/a
```

maxima [A] time = 0.99, size = 80, normalized size = 1.00

$$\frac{\sqrt{e}\left(i\cos\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right)-3i\cos\left(\frac{1}{3}\arctan\left(\sin\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right),\cos\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right)\right)\right)+\sin\left(\frac{3}{2}\,dx+\frac{3}{2}\,c\right)+3\sin\left(\frac{1}{3}\,a\right.}{3\sqrt{a}\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxim
a")
```

```
[Out] 1/3*sqrt(e)*(I*cos(3/2*d*x + 3/2*c) - 3*I*cos(1/3*arctan2(sin(3/2*d*x + 3/2
*c), cos(3/2*d*x + 3/2*c))) + sin(3/2*d*x + 3/2*c) + 3*sin(1/3*arctan2(sin(
3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))))/(sqrt(a)*d)
```

mupad [B] time = 0.73, size = 82, normalized size = 1.02

$$\frac{\sqrt{e\,\cos\left(c+d\,x\right)}\,\left(\cos\left(2\,c+2\,d\,x\right)\,1{}\mathrm{i}+\sin\left(2\,c+2\,d\,x\right)-3{}\mathrm{i}\right)\,\sqrt{\frac{a\,\left(\cos(2\,c+2\,d\,x)+1+\sin(2\,c+2\,d\,x)\,1{}\mathrm{i}\right)}{\cos(2\,c+2\,d\,x)+1}}}{3\,a\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^(1/2)/(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] ((e*cos(c + d*x))^(1/2)*(cos(2*c + 2*d*x)*1i + sin(2*c + 2*d*x) - 3i)*((a*(
cos(2*c + 2*d*x) + sin(2*c + 2*d*x)*1i + 1))/(cos(2*c + 2*d*x) + 1))^(1/2))
/(3*a*d)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\cos\left(c+dx\right)}}{\sqrt{ia\left(\tan\left(c+dx\right)-i\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**(1/2)/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(sqrt(e*cos(c + d*x))/sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.684 $\int \frac{1}{\sqrt{e\cos(c+dx)}\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=36

$$\frac{2i}{d\sqrt{a+ia\tan(c+dx)}\sqrt{e\cos(c+dx)}}$$

```
[Out] 2*I/d/(e*cos(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)
```

Rubi [A] time = 0.14, antiderivative size = 36, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.067, Rules used = {3515, 3488}

$$\frac{2i}{d\sqrt{a+ia\tan(c+dx)}\sqrt{e\cos(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[1/(Sqrt[e*Cos[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]),x]
```

```
[Out] (2*I)/(d*Sqrt[e*Cos[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]])
```

Rule 3488

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^n)
/(a*f*m), x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 + b^2, 0] && EqQ
[Simplify[m + n], 0]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] && !IntegerQ[m]
```

Rubi steps

$$\begin{aligned}\int \frac{1}{\sqrt{e\cos(c+dx)}\sqrt{a+ia\tan(c+dx)}}\,dx &= \frac{\int \frac{\sqrt{e\sec(c+dx)}}{\sqrt{a+ia\tan(c+dx)}}\,dx}{\sqrt{e\cos(c+dx)}\sqrt{e\sec(c+dx)}}\\ &= \frac{2i}{d\sqrt{e\cos(c+dx)}\sqrt{a+ia\tan(c+dx)}}\end{aligned}$$

Mathematica [A] time = 0.19, size = 36, normalized size = 1.00

$$\frac{2i}{d\sqrt{a+ia\tan(c+dx)}\sqrt{e\cos(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/(Sqrt[e*Cos[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]),x]
```

```
[Out] (2*I)/(d*Sqrt[e*Cos[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [B] time = 0.58, size = 58, normalized size = 1.61

$$\frac{2i\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\,e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}}{ade}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fri
cas")
```

```
[Out] 2*I*sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x +
2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)/(a*d*e)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{e\cos(dx+c)}\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="gia
c")
```

```
[Out] integrate(1/(sqrt(e*cos(d*x + c))*sqrt(I*a*tan(d*x + c) + a)), x)
```

maple [B] time = 1.43, size = 69, normalized size = 1.92

$$-\frac{2i\sqrt{e\cos(dx+c)}\,\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\,(i\sin(dx+c)-\cos(dx+c))}{dea}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cos(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] -2*I/d*(e*cos(d*x+c))^(1/2)*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))^(1/2)*
(I*sin(d*x+c)-cos(d*x+c))/e/a
```

maxima [B] time = 0.65, size = 76, normalized size = 2.11

$$\frac{2i\sqrt{-\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-1}}{\sqrt{a}\,d\sqrt{e}\sqrt{-\frac{2i\sin(dx+c)}{\cos(dx+c)+1}+\frac{\sin(dx+c)^2}{(\cos(dx+c)+1)^2}-1}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="max
ima")
```

```
[Out] 2*I*sqrt(-sin(d*x + c)^2/(cos(d*x + c) + 1)^2 - 1)/(sqrt(a)*d*sqrt(e)*sqrt(
-2*I*sin(d*x + c)/(cos(d*x + c) + 1) + sin(d*x + c)^2/(cos(d*x + c) + 1)^2
- 1))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{\sqrt{e\,\cos(c+d\,x)}\,\sqrt{a+a\tan(c+d\,x)\,1\mathrm{i}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^(1/2)),x)
```

```
[Out] int(1/((e*cos(c + d*x))^(1/2)*(a + a*tan(c + d*x)*1i)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{e\cos(c+dx)}\sqrt{ia(\tan(c+dx)-i)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))**(1/2)/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral(1/(sqrt(e*cos(c + d*x))*sqrt(I*a*(tan(c + d*x) - I))), x)
```

3.685 $\int \frac{1}{(e\cos(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=495

$$-\frac{i\sqrt{2}\sqrt{a}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{a-ia\tan(c+dx)}\sqrt{e\cos(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{de^{3/2}\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}+\frac{i\sqrt{2}\sqrt{a}\sec(c+dx)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{a-ia\tan(c+dx)}\sqrt{e\cos(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{de^{3/2}\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] 1/2*I*ln(a*e^(1/2)-2^(1/2)*a^(1/2)*(e*cos(d*x+c))^(1/2)*(a-I*a*tan(d*x+c))^
(1/2)+cos(d*x+c)*e^(1/2)*(a-I*a*tan(d*x+c)))*sec(d*x+c)*a^(1/2)/d/e^(3/2)*2
^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)-1/2*I*ln(a*e^(1/2)
+2^(1/2)*a^(1/2)*(e*cos(d*x+c))^(1/2)*(a-I*a*tan(d*x+c))^(1/2)+cos(d*x+c)*e
^(1/2)*(a-I*a*tan(d*x+c)))*sec(d*x+c)*a^(1/2)/d/e^(3/2)*2^(1/2)/(a-I*a*tan(
d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)-I*arctan(1-2^(1/2)*(e*cos(d*x+c))^(1
/2)*(a-I*a*tan(d*x+c))^(1/2)/a^(1/2)/e^(1/2))*sec(d*x+c)*2^(1/2)*a^(1/2)/d/
e^(3/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)+I*arctan(1+2^(1/2
)*(e*cos(d*x+c))^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/a^(1/2)/e^(1/2))*sec(d*x+c)
*2^(1/2)*a^(1/2)/d/e^(3/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2
)
```

Rubi [A] time = 0.33, antiderivative size = 495, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}} = 0.267$, Rules used = {3514, 3513, 297, 1162, 617, 204, 1165, 628}

$$-\frac{i\sqrt{2}\sqrt{a}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{a-ia\tan(c+dx)}\sqrt{e\cos(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{de^{3/2}\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}+\frac{i\sqrt{2}\sqrt{a}\sec(c+dx)\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{a-ia\tan(c+dx)}\sqrt{e\cos(c+dx)}}{\sqrt{a}\sqrt{e}}\right)}{de^{3/2}\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Cos[c + d*x])^(3/2)*Sqrt[a + I*a*Tan[c + d*x]]),x]
```

```
[Out] ((-I)*Sqrt[2]*Sqrt[a]*ArcTan[1 - (Sqrt[2]*Sqrt[e*Cos[c + d*x]]*Sqrt[a - I*a
*Tan[c + d*x]])/(Sqrt[a]*Sqrt[e])]*Sec[c + d*x])/(d*e^(3/2)*Sqrt[a - I*a*Ta
n[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) + (I*Sqrt[2]*Sqrt[a]*ArcTan[1 + (Sq
rt[2]*Sqrt[e*Cos[c + d*x]]*Sqrt[a - I*a*Tan[c + d*x]])/(Sqrt[a]*Sqrt[e])]*S
ec[c + d*x])/(d*e^(3/2)*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x
]]) + (I*Sqrt[a]*Log[a*Sqrt[e] - Sqrt[2]*Sqrt[a]*Sqrt[e*Cos[c + d*x]]*Sqrt[
a - I*a*Tan[c + d*x]] + Sqrt[e]*Cos[c + d*x]*(a - I*a*Tan[c + d*x])]*Sec[c
+ d*x])/(Sqrt[2]*d*e^(3/2)*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c +
d*x]]) - (I*Sqrt[a]*Log[a*Sqrt[e] + Sqrt[2]*Sqrt[a]*Sqrt[e*Cos[c + d*x]]*Sq
rt[a - I*a*Tan[c + d*x]] + Sqrt[e]*Cos[c + d*x]*(a - I*a*Tan[c + d*x])]*Sec
[c + d*x])/(Sqrt[2]*d*e^(3/2)*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c
 + d*x]])
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3513

```
Int[Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)*(x_)]]/Sqrt[cos[(e_.) + (f_.)*(x_)]
*(d_.)], x_Symbol] :> Dist[(-4*b)/f, Subst[Int[x^2/(a^2*d^2 + x^4), x], x,
Sqrt[d*Cos[e + f*x]]*Sqrt[a + b*Tan[e + f*x]]], x] /; FreeQ[{a, b, d, e, f}
, x] && EqQ[a^2 + b^2, 0]
```

Rule 3514

```
Int[1/((cos[(e_.) + (f_.)*(x_)]*(d_.))^(3/2)*Sqrt[(a_) + (b_.)*tan[(e_.) +
(f_.)*(x_)]]), x_Symbol] :> Dist[1/(d*Cos[e + f*x]*Sqrt[a - b*Tan[e + f*x]]
*Sqrt[a + b*Tan[e + f*x]]), Int[Sqrt[a - b*Tan[e + f*x]]/Sqrt[d*Cos[e + f*x
]], x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{1}{(e\cos(c+dx))^{3/2}\sqrt{a+ia\tan(c+dx)}}\,dx = \frac{\sec(c+dx)\int \frac{\sqrt{a-ia\tan(c+dx)}}{\sqrt{e\cos(c+dx)}}\,dx}{e\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}$$

$$= \frac{(4ia\sec(c+dx))\,\text{Subst}\left(\int \frac{x^2}{a^2e^2+x^4}\,dx, x, \sqrt{e\cos(c+dx)}\sqrt{a-ia\tan}\right.}{de\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}$$

$$= -\frac{(2ia\sec(c+dx))\,\text{Subst}\left(\int \frac{ae-x^2}{a^2e^2+x^4}\,dx, x, \sqrt{e\cos(c+dx)}\sqrt{a-ia\,\text{ta}}\right.}{de\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}$$

$$= \frac{\left(i\sqrt{a}\sec(c+dx)\right)\text{Subst}\left(\int \frac{\sqrt{2}\sqrt{a}\sqrt{e}+2x}{-ae-\sqrt{2}\sqrt{a}\sqrt{e}x-x^2}\,dx, x, \sqrt{e\cos(c+dx)}\right.}{\sqrt{2}de^{3/2}\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}}$$

$$= \frac{i\sqrt{a}\log\left(a\sqrt{e}-\sqrt{2}\sqrt{a}\sqrt{e\cos(c+dx)}\sqrt{a-ia\tan(c+dx)}+\sqrt{e}\,\text{c}\right.}{\sqrt{2}de^{3/2}\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia}}$$

$$= -\frac{i\sqrt{2}\sqrt{a}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e\cos(c+dx)}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e}}\right)\sec(c+dx)}{de^{3/2}\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}} + \frac{i\sqrt{}}{}$$

Mathematica [A] time = 9.91, size = 209, normalized size = 0.42

$$\frac{ie^{\frac{1}{2}i(c+dx)}\left(\log\left(-\sqrt{2}e^{\frac{1}{2}i(c+dx)}+e^{i(c+dx)}+1\right)-\log\left(\sqrt{2}e^{\frac{1}{2}i(c+dx)}+e^{i(c+dx)}+1\right)+2\tan^{-1}\left(1-\sqrt{2}e^{\frac{1}{2}i(c+dx)}\right)-2\tan^{-1}\right.}{\sqrt{2}de\sqrt{\frac{ae^{2i(c+dx)}}{1+e^{2i(c+dx)}}}\sqrt{ee^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Cos[c + d*x])^(3/2)*Sqrt[a + I*a*Tan[c + d*x]]),x]
```

```
[Out] (I*E^((I/2)*(c + d*x))*(2*ArcTan[1 - Sqrt[2]*E^((I/2)*(c + d*x))] - 2*ArcTa
n[1 + Sqrt[2]*E^((I/2)*(c + d*x))] + Log[1 - Sqrt[2]*E^((I/2)*(c + d*x)) +
E^(I*(c + d*x))] - Log[1 + Sqrt[2]*E^((I/2)*(c + d*x)) + E^(I*(c + d*x))]))
/(Sqrt[2]*d*e*Sqrt[(a*E^((2*I)*(c + d*x)))/(1 + E^((2*I)*(c + d*x)))]*Sqrt[
(e*(1 + E^((2*I)*(c + d*x))))/E^(I*(c + d*x))])
```

fricas [A] time = 0.44, size = 341, normalized size = 0.69

$$-\frac{1}{2}\sqrt{\frac{4i}{ad^2e^3}}\log\left(\frac{1}{2}ade^2\sqrt{\frac{4i}{ad^2e^3}}+\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{ee^{(2idx+2ic)}+e}\sqrt{\frac{a}{e^{(2idx+2ic)}+1}}e^{\left(-\frac{1}{2}idx-\frac{1}{2}ic\right)}\right)+\frac{1}{2}\sqrt{\frac{4i}{ad^2e^3}}\log\left(-\frac{1}{2}a\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fri
cas")
```

```
[Out] -1/2*sqrt(4*I/(a*d^2*e^3))*log(1/2*a*d*e^2*sqrt(4*I/(a*d^2*e^3)) + sqrt(2)*
sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))
*e^(-1/2*I*d*x - 1/2*I*c)) + 1/2*sqrt(4*I/(a*d^2*e^3))*log(-1/2*a*d*e^2*sqr
t(4*I/(a*d^2*e^3)) + sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt
(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)) + 1/2*sqrt(-4*I/(a*
d^2*e^3))*log(1/2*a*d*e^2*sqrt(-4*I/(a*d^2*e^3)) + sqrt(2)*sqrt(1/2)*sqrt(e
*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x -
 1/2*I*c)) - 1/2*sqrt(-4*I/(a*d^2*e^3))*log(-1/2*a*d*e^2*sqrt(-4*I/(a*d^2*e
^3)) + sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x
 + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(e\cos\left(dx+c\right)\right)^{\frac{3}{2}}\sqrt{ia\tan\left(dx+c\right)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="gia
c")
```

```
[Out] integrate(1/((e*cos(d*x + c))^(3/2)*sqrt(I*a*tan(d*x + c) + a)), x)
```

maple [A] time = 1.40, size = 232, normalized size = 0.47

$$\frac{\left(\cos^{2}\left(dx+c\right)\right)\left(-1+\cos\left(dx+c\right)\right)^{2}\sqrt{\frac{a\left(i\sin\left(dx+c\right)+\cos\left(dx+c\right)\right)}{\cos\left(dx+c\right)}}\left(i\,\mathrm{arctanh}\left(\frac{\sqrt{\frac{1}{1+\cos\left(dx+c\right)}}\,\left(\cos\left(dx+c\right)+1+\sin\left(dx+c\right)\right)}{2}\right)+i\,\mathrm{arc}\right.}{d\sin\left(dx+c\right)^{3}\left(e\cos\left(dx+c\right)\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cos(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 1/d*cos(d*x+c)^2*(-1+cos(d*x+c))^2*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c))
^(1/2)*(I*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))+I
*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(-cos(d*x+c)-1+sin(d*x+c)))+arctanh(1
/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))-arctanh(1/2*(1/(1+co
s(d*x+c)))^(1/2)*(-cos(d*x+c)-1+sin(d*x+c))))/sin(d*x+c)^3/(e*cos(d*x+c))^(
3/2)/(1/(1+cos(d*x+c)))^(3/2)/(I*sin(d*x+c)+cos(d*x+c)-1)/a
```

maxima [A] time = 1.48, size = 714, normalized size = 1.44

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(3/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="max
ima")
```

```
[Out] -1/4*(2*I*sqrt(2)*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c) + 1, sqrt(2)*sin(1/2
*d*x + 1/2*c) + 1) + 2*I*sqrt(2)*arctan2(sqrt(2)*cos(1/2*d*x + 1/2*c) + 1,
-sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) + 2*I*sqrt(2)*arctan2(sqrt(2)*cos(1/2*d*
x + 1/2*c) - 1, sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) + 2*I*sqrt(2)*arctan2(sqr
t(2)*cos(1/2*d*x + 1/2*c) - 1, -sqrt(2)*sin(1/2*d*x + 1/2*c) + 1) - 2*sqrt(
2)*arctan2(sqrt(2)*sin(1/2*d*x + 1/2*c) + sin(d*x + c), sqrt(2)*cos(1/2*d*x
 + 1/2*c) + cos(d*x + c) + 1) + 2*sqrt(2)*arctan2(-sqrt(2)*sin(1/2*d*x + 1/
2*c) + sin(d*x + c), -sqrt(2)*cos(1/2*d*x + 1/2*c) + cos(d*x + c) + 1) + I*
sqrt(2)*log(2*sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) + 2*(sqrt(2)*cos(1/
2*d*x + 1/2*c) + 1)*cos(d*x + c) + cos(d*x + c)^2 + 2*cos(1/2*d*x + 1/2*c)^
2 + sin(d*x + c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2
*c) + 1) - I*sqrt(2)*log(-2*sqrt(2)*sin(d*x + c)*sin(1/2*d*x + 1/2*c) - 2*(
sqrt(2)*cos(1/2*d*x + 1/2*c) - 1)*cos(d*x + c) + cos(d*x + c)^2 + 2*cos(1/2
*d*x + 1/2*c)^2 + sin(d*x + c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos
(1/2*d*x + 1/2*c) + 1) - sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d
*x + 1/2*c)^2 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/
2*c) + 2) + sqrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2
 + 2*sqrt(2)*cos(1/2*d*x + 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) - s
qrt(2)*log(2*cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*
cos(1/2*d*x + 1/2*c) + 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2) + sqrt(2)*log(2*
```

```
cos(1/2*d*x + 1/2*c)^2 + 2*sin(1/2*d*x + 1/2*c)^2 - 2*sqrt(2)*cos(1/2*d*x +
 1/2*c) - 2*sqrt(2)*sin(1/2*d*x + 1/2*c) + 2))/(sqrt(a)*d*e^(3/2))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{(e\cos(c+dx))^{3/2}\sqrt{a+a\tan(c+dx)\,1\mathrm{i}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^(1/2)),x)
[Out] int(1/((e*cos(c + d*x))^(3/2)*(a + a*tan(c + d*x)*1i)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\cos(c+dx))^{\frac{3}{2}}\sqrt{ia(\tan(c+dx)-i)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))**(3/2)/(a+I*a*tan(d*x+c))**(1/2),x)
[Out] Integral(1/((e*cos(c + d*x))**(3/2)*sqrt(I*a*(tan(c + d*x) - I))), x)
```

3.686 $\int \frac{1}{(e\cos(c+dx))^{5/2}\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=470

$$\frac{ie^{5/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\sqrt{a}\,d(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}}-\frac{ie^{5/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\sqrt{a}\,d(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}}-\frac{ie^{5/2}\log\left(-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a}}{\sqrt{e\sec}}\right.}{2\sqrt{2}\sqrt{a}}$$

```
[Out] 1/2*I*e^(5/2)*arctan(1-2^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*
sec(d*x+c))^(1/2))/d/(e*cos(d*x+c))^(5/2)/(e*sec(d*x+c))^(5/2)*2^(1/2)/a^(1
/2)-1/2*I*e^(5/2)*arctan(1+2^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)/a^(1/2)
/(e*sec(d*x+c))^(1/2))/d/(e*cos(d*x+c))^(5/2)/(e*sec(d*x+c))^(5/2)*2^(1/2)/
a^(1/2)-1/4*I*e^(5/2)*ln(a-2^(1/2)*a^(1/2)*e^(1/2)*(a+I*a*tan(d*x+c))^(1/2)
/(e*sec(d*x+c))^(1/2)+cos(d*x+c)*(a+I*a*tan(d*x+c)))/d/(e*cos(d*x+c))^(5/2)
/(e*sec(d*x+c))^(5/2)*2^(1/2)/a^(1/2)+1/4*I*e^(5/2)*ln(a+2^(1/2)*a^(1/2)*e^
(1/2)*(a+I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2)+cos(d*x+c)*(a+I*a*tan(d
*x+c)))/d/(e*cos(d*x+c))^(5/2)/(e*sec(d*x+c))^(5/2)*2^(1/2)/a^(1/2)-I*cos(d
*x+c)^2*(a+I*a*tan(d*x+c))^(1/2)/a/d/(e*cos(d*x+c))^(5/2)
```

Rubi [A] time = 0.44, antiderivative size = 470, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {3515, 3501, 3495, 297, 1162, 617, 204, 1165, 628}

$$\frac{ie^{5/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\sqrt{a}\,d(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}}-\frac{ie^{5/2}\tan^{-1}\left(1+\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\sqrt{a}\,d(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}}-\frac{ie^{5/2}\log\left(-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a}}{\sqrt{e\sec}}\right.}{2\sqrt{2}\sqrt{a}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Cos[c + d*x])^(5/2)*Sqrt[a + I*a*Tan[c + d*x]]),x]
```

```
[Out] (I*e^(5/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]])/(Sqrt[a]
*Sqrt[e*Sec[c + d*x]])])/(Sqrt[2]*Sqrt[a]*d*(e*Cos[c + d*x])^(5/2)*(e*Sec[c
 + d*x])^(5/2)) - (I*e^(5/2)*ArcTan[1 + (Sqrt[2]*Sqrt[e]*Sqrt[a + I*a*Tan[c
 + d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])])/(Sqrt[2]*Sqrt[a]*d*(e*Cos[c + d*
x])^(5/2)*(e*Sec[c + d*x])^(5/2)) - ((I/2)*e^(5/2)*Log[a - (Sqrt[2]*Sqrt[a]
*Sqrt[e]*Sqrt[a + I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a
 + I*a*Tan[c + d*x])])/(Sqrt[2]*Sqrt[a]*d*(e*Cos[c + d*x])^(5/2)*(e*Sec[c +
 d*x])^(5/2)) + ((I/2)*e^(5/2)*Log[a + (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a + I*
a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a + I*a*Tan[c + d*x])
])/(Sqrt[2]*Sqrt[a]*d*(e*Cos[c + d*x])^(5/2)*(e*Sec[c + d*x])^(5/2)) - (I*C
os[c + d*x]^2*Sqrt[a + I*a*Tan[c + d*x]])/(a*d*(e*Cos[c + d*x])^(5/2))
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
```

```
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3495

```
Int[Sqrt[(d_.)*sec[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[(-4*b*d^2)/f, Subst[Int[x^2/(a^2 + d^2*x^4), x],
 x, Sqrt[a + b*Tan[e + f*x]]/Sqrt[d*Sec[e + f*x]]], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rubi steps

$$\int \frac{1}{(e\cos(c+dx))^{5/2}\sqrt{a+ia\tan(c+dx)}}\,dx = \frac{\int \frac{(e\sec(c+dx))^{5/2}}{\sqrt{a+ia\tan(c+dx)}}\,dx}{(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}}$$

$$= -\frac{i\cos^2(c+dx)\sqrt{a+ia\tan(c+dx)}}{ad(e\cos(c+dx))^{5/2}} + \frac{e^2\int\sqrt{e\sec(c+dx)}\,\sqrt{a+}}{2a(e\cos(c+dx))^{5/2}(e}$$

$$= -\frac{i\cos^2(c+dx)\sqrt{a+ia\tan(c+dx)}}{ad(e\cos(c+dx))^{5/2}} - \frac{(2ie^4)\,\mathrm{Subst}\left(\int\frac{x^2}{a^2+e^2x^4}\,dx\right.}{d(e\cos(c+dx))^{5/2}(e}$$

$$= -\frac{i\cos^2(c+dx)\sqrt{a+ia\tan(c+dx)}}{ad(e\cos(c+dx))^{5/2}} + \frac{(ie^3)\,\mathrm{Subst}\left(\int\frac{a-ex^2}{a^2+e^2x^4}\,dx,\right.}{d(e\cos(c+dx))^{5/2}(e}$$

$$= -\frac{i\cos^2(c+dx)\sqrt{a+ia\tan(c+dx)}}{ad(e\cos(c+dx))^{5/2}} - \frac{(ie^2)\,\mathrm{Subst}\left(\int\frac{1}{\frac{a}{e}-\frac{\sqrt{2}\sqrt{a}x}{\sqrt{e}}+x}\right.}{2d(e\cos(c+dx))^{5/2}}$$

$$= -\frac{ie^{5/2}\log\left(a-\frac{\sqrt{2}\sqrt{a}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{e\sec(c+dx)}}+\cos(c+dx)(a+ia\tan(c\right.}{2\sqrt{2}\sqrt{a}\,d(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}}$$

$$= \frac{ie^{5/2}\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a+ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{\sqrt{2}\sqrt{a}\,d(e\cos(c+dx))^{5/2}(e\sec(c+dx))^{5/2}} - \frac{ie^{5/2}\tan^{-1}\left(1+\right.}{\sqrt{2}\sqrt{a}\,d(e\cos(c+}$$

Mathematica [A] time = 1.77, size = 250, normalized size = 0.53

$$\frac{ie^{ic-\frac{idx}{2}}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\left(\left(-e^{-2ic}\right)^{3/4}\left(1+e^{2i(c+dx)}\right)\tan^{-1}\left(\frac{e^{\frac{idx}{2}}}{\sqrt[4]{-e^{-2ic}}}\right)-\left(-e^{-2ic}\right)^{3/4}\left(1+e^{2i(c+dx)}\right)\tanh^{-1}\left(\frac{e^{\frac{idx}{2}}}{\sqrt[4]{-e^{-2ic}}}\right)-2e^{\frac{3ic}{2}}\right.}{d\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}\sqrt{\cos(c+dx)}\sec^{\frac{5}{2}}(c+dx)\sqrt{a+ia\tan(c+dx)}(e\cos(c+dx))^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Cos[c + d*x])^(5/2)*Sqrt[a + I*a*Tan[c + d*x]]),x]
```

```
[Out] (I*E^(I*c - (I/2)*d*x)*Sqrt[E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x)))]*(-2*
E^(((3*I)/2)*d*x) + (-E^((-2*I)*c))^(3/4)*(1 + E^((2*I)*(c + d*x)))*ArcTan[
E^((I/2)*d*x)/(-E^((-2*I)*c))^(1/4)] - (-E^((-2*I)*c))^(3/4)*(1 + E^((2*I)*
(c + d*x)))*ArcTanh[E^((I/2)*d*x)/(-E^((-2*I)*c))^(1/4)]))/(d*Sqrt[(1 + E^(
(2*I)*(c + d*x)))/E^(I*(c + d*x))]*Sqrt[Cos[c + d*x]]*(e*Cos[c + d*x])^(5/2
)*Sec[c + d*x]^(5/2)*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.47, size = 502, normalized size = 1.07

$$-4i\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}e^{\left(\frac{3}{2}i\,dx+\frac{3}{2}i\,c\right)}-\left(ade^3e^{(2i\,dx+2i\,c)}+ade^3\right)\sqrt{\frac{i}{ad^2e^5}}\log\left(i\,ade^3\sqrt{\frac{i}{ad^2e^5}}+\sqrt{2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fri
cas")
```

```
[Out] 1/2*(-4*I*sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*
d*x + 2*I*c) + 1))*e^(3/2*I*d*x + 3/2*I*c) - (a*d*e^3*e^(2*I*d*x + 2*I*c) +
 a*d*e^3)*sqrt(I/(a*d^2*e^5))*log(I*a*d*e^3*sqrt(I/(a*d^2*e^5)) + sqrt(2)*s
qrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*
```

```
e^(-1/2*I*d*x - 1/2*I*c)) + (a*d*e^3*e^(2*I*d*x + 2*I*c) + a*d*e^3)*sqrt(I/
(a*d^2*e^5))*log(-I*a*d*e^3*sqrt(I/(a*d^2*e^5)) + sqrt(2)*sqrt(1/2)*sqrt(e*
e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x -
1/2*I*c)) - (a*d*e^3*e^(2*I*d*x + 2*I*c) + a*d*e^3)*sqrt(-I/(a*d^2*e^5))*lo
g(I*a*d*e^3*sqrt(-I/(a*d^2*e^5)) + sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*
I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)) + (a*
d*e^3*e^(2*I*d*x + 2*I*c) + a*d*e^3)*sqrt(-I/(a*d^2*e^5))*log(-I*a*d*e^3*sq
rt(-I/(a*d^2*e^5)) + sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt
(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)))/(a*d*e^3*e^(2*I*d*
x + 2*I*c) + a*d*e^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(e\cos\left(dx+c\right)\right)^{\frac{5}{2}}\sqrt{i\,a\tan\left(dx+c\right)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="gia
c")
```

```
[Out] integrate(1/((e*cos(d*x + c))^(5/2)*sqrt(I*a*tan(d*x + c) + a)), x)
```

maple [A] time = 1.52, size = 313, normalized size = 0.67

$$-\frac{\left(\cos^2\left(dx+c\right)\right)\left(-1+\cos\left(dx+c\right)\right)^3\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(i\cos\left(dx+c\right)\operatorname{arctanh}\left(\frac{\sqrt{\frac{1}{1+\cos(dx+c)}}\,(-\cos(dx+c)-1+\sin(d}{2}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cos(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] -1/2/d*cos(d*x+c)^2*(-1+cos(d*x+c))^3*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+
c))^(1/2)*(I*cos(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(-cos(d*x+c)-1
+sin(d*x+c)))+I*cos(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*x+c)
+1+sin(d*x+c)))+2*I*(1/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)+cos(d*x+c)*arctanh(
1/2*(1/(1+cos(d*x+c)))^(1/2)*(-cos(d*x+c)-1+sin(d*x+c)))+2*cos(d*x+c)*(1/(1
+cos(d*x+c)))^(1/2)-cos(d*x+c)*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos(d*
x+c)+1+sin(d*x+c)))+2*(1/(1+cos(d*x+c)))^(1/2))/sin(d*x+c)^5/(I*sin(d*x+c)+
cos(d*x+c)-1)/(1/(1+cos(d*x+c)))^(5/2)/(e*cos(d*x+c))^(5/2)/a
```

maxima [B] time = 0.85, size = 2168, normalized size = 4.61

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(5/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="max
ima")
```

```
[Out] -((16*sqrt(2)*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))
+ 16*I*sqrt(2)*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))
 + 16*sqrt(2))*arctan2(sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/
2*d*x + 3/2*c))) + 1, sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2
*d*x + 3/2*c))) + 1) + (16*sqrt(2)*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), co
s(3/2*d*x + 3/2*c))) + 16*I*sqrt(2)*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), c
os(3/2*d*x + 3/2*c))) + 16*sqrt(2))*arctan2(sqrt(2)*cos(1/3*arctan2(sin(3/2
*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1, -sqrt(2)*sin(1/3*arctan2(sin(3/2
```

*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) + (16*sqrt(2)*cos(4/3*arctan2(si
n(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 16*I*sqrt(2)*sin(4/3*arctan2(s
in(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 16*sqrt(2))*arctan2(sqrt(2)*c
os(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 1, sqrt(2)*si
n(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) + (16*sqrt(
2)*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 16*I*sqrt
(2)*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 16*sqrt(
2))*arctan2(sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2
*c))) - 1, -sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2
*c))) + 1) - (16*I*sqrt(2)*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*
x + 3/2*c))) - 16*sqrt(2)*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x
 + 3/2*c))) + 16*I*sqrt(2))*arctan2(sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3
/2*c), cos(3/2*d*x + 3/2*c))) + sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3
/2*d*x + 3/2*c))), sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*
x + 3/2*c))) + cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))
 + 1) - (-16*I*sqrt(2)*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x +
3/2*c))) + 16*sqrt(2)*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3
/2*c))) - 16*I*sqrt(2))*arctan2(-sqrt(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*
c), cos(3/2*d*x + 3/2*c))) + sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*
d*x + 3/2*c))), -sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x
+ 3/2*c))) + cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) +
 1) - (8*sqrt(2)*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)
)) + 8*I*sqrt(2)*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)
)) + 8*sqrt(2))*log(2*sqrt(2)*sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2
*d*x + 3/2*c)))*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))
) + 2*(sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))
 + 1)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + cos(2/
3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*cos(1/3*arctan
2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + sin(2/3*arctan2(sin(3/2*
d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sin(1/3*arctan2(sin(3/2*d*x + 3/
2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/
2*c), cos(3/2*d*x + 3/2*c))) + 1) + (8*sqrt(2)*cos(4/3*arctan2(sin(3/2*d*x
+ 3/2*c), cos(3/2*d*x + 3/2*c))) + 8*I*sqrt(2)*sin(4/3*arctan2(sin(3/2*d*x
+ 3/2*c), cos(3/2*d*x + 3/2*c))) + 8*sqrt(2))*log(-2*sqrt(2)*sin(2/3*arctan
2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))*sin(1/3*arctan2(sin(3/2*d*x
+ 3/2*c), cos(3/2*d*x + 3/2*c))) - 2*(sqrt(2)*cos(1/3*arctan2(sin(3/2*d*x +
 3/2*c), cos(3/2*d*x + 3/2*c))) - 1)*cos(2/3*arctan2(sin(3/2*d*x + 3/2*c),
cos(3/2*d*x + 3/2*c))) + cos(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x
+ 3/2*c)))^2 + 2*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)
))^2 + sin(2/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*s
in(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 - 2*sqrt(2)*c
os(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 1) - (-8*I*sq
rt(2)*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 8*sqrt
(2)*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 8*I*sqrt
(2))*log(2*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 +
 2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sqrt(
2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2*sqrt(2)
*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2) - (8*I*s
qrt(2)*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 8*sqr
t(2)*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 8*I*sqr
t(2))*log(2*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2
+ 2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 + 2*sqrt
(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 2*sqrt(2
)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2) - (-8*I
*sqrt(2)*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 8*s
qrt(2)*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 8*I*s
qrt(2))*log(2*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^
2 + 2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 - 2*sq
rt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2*sqrt

```
(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2) - (8*
I*sqrt(2)*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 8*
sqrt(2)*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 8*I*
sqrt(2))*log(2*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))
^2 + 2*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c)))^2 - 2*s
qrt(2)*cos(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 2*sqr
t(2)*sin(1/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 2) + 12
8*cos(3/2*d*x + 3/2*c) + 128*I*sin(3/2*d*x + 3/2*c))*sqrt(a)*sqrt(e)/((-64*
I*a*e^3*cos(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) + 64*a
*e^3*sin(4/3*arctan2(sin(3/2*d*x + 3/2*c), cos(3/2*d*x + 3/2*c))) - 64*I*a*
e^3)*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{(e \cos(c+dx))^{5/2} \sqrt{a + a \tan(c+dx)\, 1\mathrm{i}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cos(c + d*x))^(5/2)*(a + a*tan(c + d*x)*1i)^(1/2)),x)
[Out] int(1/((e*cos(c + d*x))^(5/2)*(a + a*tan(c + d*x)*1i)^(1/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))**(5/2)/(a+I*a*tan(d*x+c))**(1/2),x)
[Out] Timed out
```

3.687 $\int \frac{1}{(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=682

$$-\frac{3i\sqrt{a}\,e^{7/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{4\sqrt{2}\,d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}\,(e\cos(c+dx))^{7/2}(e\sec(c+dx))^{7/2}}+\frac{3i\sqrt{a}\,e^{7/2}\sec}{4\sqrt{2}\,d\sqrt{a-ia\tan(c+dx)}}$$

```
[Out] 3/4*I*cos(d*x+c)^2/d/(e*cos(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^(1/2)-3/8*I*e^
(7/2)*arctan(1-2^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*sec(d*x+
c))^(1/2))*sec(d*x+c)*a^(1/2)/d/(e*cos(d*x+c))^(7/2)/(e*sec(d*x+c))^(7/2)*2
^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)+3/8*I*e^(7/2)*arct
an(1+2^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/a^(1/2)/(e*sec(d*x+c))^(1/2))
*sec(d*x+c)*a^(1/2)/d/(e*cos(d*x+c))^(7/2)/(e*sec(d*x+c))^(7/2)*2^(1/2)/(a-
I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)+3/16*I*e^(7/2)*ln(a-2^(1/2)*
a^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1/2)+cos(d*x+c)*(a
-I*a*tan(d*x+c)))*sec(d*x+c)*a^(1/2)/d/(e*cos(d*x+c))^(7/2)/(e*sec(d*x+c))^
(7/2)*2^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^(1/2)-3/16*I*e^(7
/2)*ln(a+2^(1/2)*a^(1/2)*e^(1/2)*(a-I*a*tan(d*x+c))^(1/2)/(e*sec(d*x+c))^(1
/2)+cos(d*x+c)*(a-I*a*tan(d*x+c)))*sec(d*x+c)*a^(1/2)/d/(e*cos(d*x+c))^(7/2
)/(e*sec(d*x+c))^(7/2)*2^(1/2)/(a-I*a*tan(d*x+c))^(1/2)/(a+I*a*tan(d*x+c))^
(1/2)-1/2*I*cos(d*x+c)^2*(a+I*a*tan(d*x+c))^(1/2)/a/d/(e*cos(d*x+c))^(7/2)
```

Rubi [A] time = 0.78, antiderivative size = 682, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, integrand size = 30, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.367, Rules used = {3515, 3501, 3498, 3499, 3495, 297, 1162, 617, 204, 1165, 628}

$$-\frac{3i\sqrt{a}\,e^{7/2}\sec(c+dx)\tan^{-1}\left(1-\frac{\sqrt{2}\sqrt{e}\sqrt{a-ia\tan(c+dx)}}{\sqrt{a}\sqrt{e\sec(c+dx)}}\right)}{4\sqrt{2}\,d\sqrt{a-ia\tan(c+dx)}\sqrt{a+ia\tan(c+dx)}\,(e\cos(c+dx))^{7/2}(e\sec(c+dx))^{7/2}}+\frac{3i\sqrt{a}\,e^{7/2}\sec}{4\sqrt{2}\,d\sqrt{a-ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((e*Cos[c + d*x])^(7/2)*Sqrt[a + I*a*Tan[c + d*x]]),x]
```

```
[Out] (((3*I)/4)*Cos[c + d*x]^2)/(d*(e*Cos[c + d*x])^(7/2)*Sqrt[a + I*a*Tan[c + d
*x]]) - (((3*I)/4)*Sqrt[a]*e^(7/2)*ArcTan[1 - (Sqrt[2]*Sqrt[e]*Sqrt[a - I*a
*Tan[c + d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])]*Sec[c + d*x])/(Sqrt[2]*d*(e
*Cos[c + d*x])^(7/2)*(e*Sec[c + d*x])^(7/2)*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt
[a + I*a*Tan[c + d*x]]) + (((3*I)/4)*Sqrt[a]*e^(7/2)*ArcTan[1 + (Sqrt[2]*Sq
rt[e]*Sqrt[a - I*a*Tan[c + d*x]])/(Sqrt[a]*Sqrt[e*Sec[c + d*x]])]*Sec[c + d
*x])/(Sqrt[2]*d*(e*Cos[c + d*x])^(7/2)*(e*Sec[c + d*x])^(7/2)*Sqrt[a - I*a*
Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) + (((3*I)/8)*Sqrt[a]*e^(7/2)*Log[
a - (Sqrt[2]*Sqrt[a]*Sqrt[e]*Sqrt[a - I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x
]] + Cos[c + d*x]*(a - I*a*Tan[c + d*x])]*Sec[c + d*x])/(Sqrt[2]*d*(e*Cos[c
 + d*x])^(7/2)*(e*Sec[c + d*x])^(7/2)*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I
*a*Tan[c + d*x]]) - (((3*I)/8)*Sqrt[a]*e^(7/2)*Log[a + (Sqrt[2]*Sqrt[a]*Sqr
t[e]*Sqrt[a - I*a*Tan[c + d*x]])/Sqrt[e*Sec[c + d*x]] + Cos[c + d*x]*(a - I
*a*Tan[c + d*x])]*Sec[c + d*x])/(Sqrt[2]*d*(e*Cos[c + d*x])^(7/2)*(e*Sec[c
+ d*x])^(7/2)*Sqrt[a - I*a*Tan[c + d*x]]*Sqrt[a + I*a*Tan[c + d*x]]) - ((I/
2)*Cos[c + d*x]^2*Sqrt[a + I*a*Tan[c + d*x]])/(a*d*(e*Cos[c + d*x])^(7/2))
```

Rule 204

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> -Simp[ArcTan[(Rt[-b, 2]*x)/Rt[
-a, 2]]/(Rt[-a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (LtQ[
a, 0] || LtQ[b, 0])
```

Rule 297

```
Int[(x_)^2/((a_) + (b_.)*(x_)^4), x_Symbol] :> With[{r = Numerator[Rt[a/b,
2]], s = Denominator[Rt[a/b, 2]]}, Dist[1/(2*s), Int[(r + s*x^2)/(a + b*x^4
), x], x] - Dist[1/(2*s), Int[(r - s*x^2)/(a + b*x^4), x], x]] /; FreeQ[{a,
 b}, x] && (GtQ[a/b, 0] || (PosQ[a/b] && AtomQ[SplitProduct[SumBaseQ, a]] &
& AtomQ[SplitProduct[SumBaseQ, b]]))
```

Rule 617

```
Int[((a_) + (b_.)*(x_) + (c_.)*(x_)^2)^(-1), x_Symbol] :> With[{q = 1 - 4*S
implify[(a*c)/b^2]}, Dist[-2/b, Subst[Int[1/(q - x^2), x], x, 1 + (2*c*x)/b
], x] /; RationalQ[q] && (EqQ[q^2, 1] ||  !RationalQ[b^2 - 4*a*c])] /; Free
Q[{a, b, c}, x] && NeQ[b^2 - 4*a*c, 0]
```

Rule 628

```
Int[((d_) + (e_.)*(x_))/((a_.) + (b_.)*(x_) + (c_.)*(x_)^2), x_Symbol] :> S
imp[(d*Log[RemoveContent[a + b*x + c*x^2, x]])/b, x] /; FreeQ[{a, b, c, d,
e}, x] && EqQ[2*c*d - b*e, 0]
```

Rule 1162

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(2*d)/e, 2]}, Dist[e/(2*c), Int[1/Simp[d/e + q*x + x^2, x], x], x] + Dist[e
/(2*c), Int[1/Simp[d/e - q*x + x^2, x], x], x]] /; FreeQ[{a, c, d, e}, x] &
& EqQ[c*d^2 - a*e^2, 0] && PosQ[d*e]
```

Rule 1165

```
Int[((d_) + (e_.)*(x_)^2)/((a_) + (c_.)*(x_)^4), x_Symbol] :> With[{q = Rt[
(-2*d)/e, 2]}, Dist[e/(2*c*q), Int[(q - 2*x)/Simp[d/e + q*x - x^2, x], x],
x] + Dist[e/(2*c*q), Int[(q + 2*x)/Simp[d/e - q*x - x^2, x], x], x]] /; Fre
eQ[{a, c, d, e}, x] && EqQ[c*d^2 - a*e^2, 0] && NegQ[d*e]
```

Rule 3495

```
Int[Sqrt[(d_.)*sec[(e_.) + (f_.)*(x_)]]*Sqrt[(a_) + (b_.)*tan[(e_.) + (f_.)
*(x_)]], x_Symbol] :> Dist[(-4*b*d^2)/f, Subst[Int[x^2/(a^2 + d^2*x^4), x],
 x, Sqrt[a + b*Tan[e + f*x]]/Sqrt[d*Sec[e + f*x]]], x] /; FreeQ[{a, b, d, e
, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3498

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x])^(n
 - 1))/(f*(m + n - 1)), x] + Dist[(a*(m + 2*n - 2))/(m + n - 1), Int[(d*Sec
[e + f*x])^m*(a + b*Tan[e + f*x])^(n - 1), x], x] /; FreeQ[{a, b, d, e, f,
m}, x] && EqQ[a^2 + b^2, 0] && GtQ[n, 0] && NeQ[m + n - 1, 0] && IntegersQ[
2*m, 2*n]
```

Rule 3499

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(3/2)/Sqrt[(a_) + (b_.)*tan[(e_.) + (f_
.)*(x_)]], x_Symbol] :> Dist[(d*Sec[e + f*x])/(Sqrt[a - b*Tan[e + f*x]]*Sqr
t[a + b*Tan[e + f*x]]), Int[Sqrt[d*Sec[e + f*x]]*Sqrt[a - b*Tan[e + f*x]],
x], x] /; FreeQ[{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0]
```

Rule 3501

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
```

```
x_)])^(n_), x_Symbol] :> Simp[(d^2*(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e +
f*x])^(n + 1))/(b*f*(m + n - 1)), x] + Dist[(d^2*(m - 2))/(a*(m + n - 1)),
Int[(d*Sec[e + f*x])^(m - 2)*(a + b*Tan[e + f*x])^(n + 1), x], x] /; FreeQ[
{a, b, d, e, f}, x] && EqQ[a^2 + b^2, 0] && LtQ[n, 0] && GtQ[m, 1] &&  !ILt
Q[m + n, 0] && NeQ[m + n - 1, 0] && IntegersQ[2*m, 2*n]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rubi steps

$$\int \frac{1}{(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}}\,dx = \frac{\int \frac{(e\sec(c+dx))^{7/2}}{\sqrt{a+ia\tan(c+dx)}}\,dx}{(e\cos(c+dx))^{7/2}(e\sec(c+dx))^{7/2}}$$

$$= -\frac{i\cos^2(c+dx)\sqrt{a+ia\tan(c+dx)}}{2ad(e\cos(c+dx))^{7/2}} + \frac{\left(3e^2\right)\int (e\sec(c+dx))^{3/2}}{4a(e\cos(c+dx))^{7/2}}$$

$$= \frac{3i\cos^2(c+dx)}{4d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}} - \frac{i\cos^2(c+dx)\sqrt{a+i}}{2ad(e\cos(c+}$$

$$= \frac{3i\cos^2(c+dx)}{4d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}} - \frac{i\cos^2(c+dx)\sqrt{a+i}}{2ad(e\cos(c+}$$

$$= \frac{3i\cos^2(c+dx)}{4d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}} - \frac{i\cos^2(c+dx)\sqrt{a+i}}{2ad(e\cos(c+}$$

$$= \frac{3i\cos^2(c+dx)}{4d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}} - \frac{i\cos^2(c+dx)\sqrt{a+i}}{2ad(e\cos(c+}$$

$$= \frac{3i\cos^2(c+dx)}{4d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}} - \frac{i\cos^2(c+dx)\sqrt{a+i}}{2ad(e\cos(c+}$$

$$= \frac{3i\cos^2(c+dx)}{4d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}} + \frac{3i\sqrt{a}\,e^{7/2}\log\left(a-\sqrt{2}\right.}{8\sqrt{2}\,d(e\cos(c+d}$$

$$= \frac{3i\cos^2(c+dx)}{4d(e\cos(c+dx))^{7/2}\sqrt{a+ia\tan(c+dx)}} - \frac{3i\sqrt{a}\,e}{4\sqrt{2}\,d(e\cos(c+dx))}$$

Mathematica [A] time = 1.54, size = 245, normalized size = 0.36

$$\frac{\sqrt{\cos(c+dx)}\left(\frac{3}{4}ie^{\frac{1}{2}i(c+dx)}\left(e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)\right)^{5/2}\left(\log\left(-\sqrt{2}\,e^{\frac{1}{2}i(c+dx)}+e^{i(c+dx)}+1\right)-\log\left(\sqrt{2}\,e^{\frac{1}{2}i(c+dx)}+e^{i(c}\right.\right.\right.}{16d\sqrt{a+ia\tan(c}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((e*Cos[c + d*x])^(7/2)*Sqrt[a + I*a*Tan[c + d*x]]),x]
```

```
[Out] (Sqrt[Cos[c + d*x]]*(((3*I)/4)*E^((I/2)*(c + d*x))*((1 + E^((2*I)*(c + d*x)
))/E^(I*(c + d*x)))^(5/2)*(2*ArcTan[1 - Sqrt[2]*E^((I/2)*(c + d*x))] - 2*Ar
```

```
cTan[1 + Sqrt[2]*E^((I/2)*(c + d*x))] + Log[1 - Sqrt[2]*E^((I/2)*(c + d*x))
 + E^(I*(c + d*x))] - Log[1 + Sqrt[2]*E^((I/2)*(c + d*x)) + E^(I*(c + d*x))
]) + 4*Sqrt[Cos[c + d*x]]*(I*Cos[c + d*x] + 2*Sin[c + d*x])))/(16*d*(e*Cos[
c + d*x])^(7/2)*Sqrt[a + I*a*Tan[c + d*x]])
```

fricas [A] time = 0.55, size = 604, normalized size = 0.89

$$\sqrt{2}\sqrt{\frac{1}{2}}\sqrt{ee^{(2i\,dx+2i\,c)}+e}\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(-i\,e^{(3i\,dx+3i\,c)}+3i\,e^{(i\,dx+i\,c)}\right)e^{\left(-\frac{1}{2}i\,dx-\frac{1}{2}i\,c\right)}-\left(ade^{4}e^{(4i\,dx+4i\,c)}+2\,ade^{4}e^{(2i\,dx+2i\,c)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fri
cas")
```

```
[Out] 1/2*(sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x +
 2*I*c) + 1))*(-I*e^(3*I*d*x + 3*I*c) + 3*I*e^(I*d*x + I*c))*e^(-1/2*I*d*x
- 1/2*I*c) - (a*d*e^4*e^(4*I*d*x + 4*I*c) + 2*a*d*e^4*e^(2*I*d*x + 2*I*c) +
 a*d*e^4)*sqrt(9/16*I/(a*d^2*e^7))*log(4/3*a*d*e^4*sqrt(9/16*I/(a*d^2*e^7))
 + sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2
*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)) + (a*d*e^4*e^(4*I*d*x + 4*I*c) + 2*a*
d*e^4*e^(2*I*d*x + 2*I*c) + a*d*e^4)*sqrt(9/16*I/(a*d^2*e^7))*log(-4/3*a*d*
e^4*sqrt(9/16*I/(a*d^2*e^7)) + sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c)
 + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)) + (a*d*e^
4*e^(4*I*d*x + 4*I*c) + 2*a*d*e^4*e^(2*I*d*x + 2*I*c) + a*d*e^4)*sqrt(-9/16
*I/(a*d^2*e^7))*log(4/3*a*d*e^4*sqrt(-9/16*I/(a*d^2*e^7)) + sqrt(2)*sqrt(1/
2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^(2*I*d*x + 2*I*c) + 1))*e^(-1/
2*I*d*x - 1/2*I*c)) - (a*d*e^4*e^(4*I*d*x + 4*I*c) + 2*a*d*e^4*e^(2*I*d*x +
 2*I*c) + a*d*e^4)*sqrt(-9/16*I/(a*d^2*e^7))*log(-4/3*a*d*e^4*sqrt(-9/16*I/
(a*d^2*e^7)) + sqrt(2)*sqrt(1/2)*sqrt(e*e^(2*I*d*x + 2*I*c) + e)*sqrt(a/(e^
(2*I*d*x + 2*I*c) + 1))*e^(-1/2*I*d*x - 1/2*I*c)))/(a*d*e^4*e^(4*I*d*x + 4*
I*c) + 2*a*d*e^4*e^(2*I*d*x + 2*I*c) + a*d*e^4)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(e\cos(dx+c))^{\frac{7}{2}}\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="gia
c")
```

```
[Out] integrate(1/((e*cos(d*x + c))^(7/2)*sqrt(I*a*tan(d*x + c) + a)), x)
```

maple [A] time = 1.52, size = 371, normalized size = 0.54

$$\left(\cos^{2}(dx+c)\right)(-1+\cos(dx+c))^{4}\sqrt{\frac{a(i\sin(dx+c)+\cos(dx+c))}{\cos(dx+c)}}\left(3i\left(\cos^{2}(dx+c)\right)\operatorname{arctanh}\left(\frac{\sqrt{\frac{1}{1+\cos(dx+c)}}\,(-\cos(dx+c)-1+\mathrm{si}\right.\right.}{2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*cos(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] 1/8/d*cos(d*x+c)^2*(-1+cos(d*x+c))^4*(a*(I*sin(d*x+c)+cos(d*x+c))/cos(d*x+c
))^(1/2)*(3*I*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(-cos(d*x+c
```

```
)-1+sin(d*x+c)))+3*I*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos(d*x+c)))^(1/2)*(cos
(d*x+c)+1+sin(d*x+c)))+6*I*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)+4
*I*(1/(1+cos(d*x+c)))^(1/2)*sin(d*x+c)-3*cos(d*x+c)^2*arctanh(1/2*(1/(1+cos
(d*x+c)))^(1/2)*(-cos(d*x+c)-1+sin(d*x+c)))+3*cos(d*x+c)^2*arctanh(1/2*(1/(
1+cos(d*x+c)))^(1/2)*(cos(d*x+c)+1+sin(d*x+c)))-6*cos(d*x+c)^2*(1/(1+cos(d*
x+c)))^(1/2)-2*cos(d*x+c)*(1/(1+cos(d*x+c)))^(1/2)+4*(1/(1+cos(d*x+c)))^(1/
2))/sin(d*x+c)^7/(I*sin(d*x+c)+cos(d*x+c)-1)/(1/(1+cos(d*x+c)))^(7/2)/(e*co
s(d*x+c))^(7/2)/a
```

maxima [B] time = 1.55, size = 2264, normalized size = 3.32

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))^(7/2)/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="max
ima")
```

```
[Out] -((192*sqrt(2)*cos(4*d*x + 4*c) + 384*sqrt(2)*cos(2*d*x + 2*c) + 192*I*sqrt
(2)*sin(4*d*x + 4*c) + 384*I*sqrt(2)*sin(2*d*x + 2*c) + 192*sqrt(2))*arctan
2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1, sqrt(2)
*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (192*sqrt(2)*c
os(4*d*x + 4*c) + 384*sqrt(2)*cos(2*d*x + 2*c) + 192*I*sqrt(2)*sin(4*d*x +
4*c) + 384*I*sqrt(2)*sin(2*d*x + 2*c) + 192*sqrt(2))*arctan2(sqrt(2)*cos(1/
4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1, -sqrt(2)*sin(1/4*arctan
2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (192*sqrt(2)*cos(4*d*x + 4*c)
 + 384*sqrt(2)*cos(2*d*x + 2*c) + 192*I*sqrt(2)*sin(4*d*x + 4*c) + 384*I*sq
rt(2)*sin(2*d*x + 2*c) + 192*sqrt(2))*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c))) - 1, sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*
c), cos(2*d*x + 2*c))) + 1) + (192*sqrt(2)*cos(4*d*x + 4*c) + 384*sqrt(2)*c
os(2*d*x + 2*c) + 192*I*sqrt(2)*sin(4*d*x + 4*c) + 384*I*sqrt(2)*sin(2*d*x
+ 2*c) + 192*sqrt(2))*arctan2(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos
(2*d*x + 2*c))) - 1, -sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
 2*c))) + 1) + (192*I*sqrt(2)*cos(4*d*x + 4*c) + 384*I*sqrt(2)*cos(2*d*x +
2*c) - 192*sqrt(2)*sin(4*d*x + 4*c) - 384*sqrt(2)*sin(2*d*x + 2*c) + 192*I*
sqrt(2))*arctan2(sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
)) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))), sqrt(2)*cos(1/4*
arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arctan2(sin(2*d*x +
2*c), cos(2*d*x + 2*c))) + 1) + (-192*I*sqrt(2)*cos(4*d*x + 4*c) - 384*I*sq
rt(2)*cos(2*d*x + 2*c) + 192*sqrt(2)*sin(4*d*x + 4*c) + 384*sqrt(2)*sin(2*d
*x + 2*c) - 192*I*sqrt(2))*arctan2(-sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c
), cos(2*d*x + 2*c))) + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))
), -sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*
arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) + (96*sqrt(2)*cos(4*d*x +
 4*c) + 192*sqrt(2)*cos(2*d*x + 2*c) + 96*I*sqrt(2)*sin(4*d*x + 4*c) + 192*
I*sqrt(2)*sin(2*d*x + 2*c) + 96*sqrt(2))*log(2*sqrt(2)*sin(1/2*arctan2(sin(
2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*
x + 2*c))) + 2*(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))
) + 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + cos(1/2*arcta
n2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*cos(1/4*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2
*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt
(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1) - (96*sqrt(2)
*cos(4*d*x + 4*c) + 192*sqrt(2)*cos(2*d*x + 2*c) + 96*I*sqrt(2)*sin(4*d*x +
 4*c) + 192*I*sqrt(2)*sin(2*d*x + 2*c) + 96*sqrt(2))*log(-2*sqrt(2)*sin(1/2
*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))*sin(1/4*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c))) - 2*(sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(
2*d*x + 2*c))) - 1)*cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) +
cos(1/2*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*cos(1/4*arctan2(
sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + sin(1/2*arctan2(sin(2*d*x + 2*c),
cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
```

```
))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 1)
+ (96*I*sqrt(2)*cos(4*d*x + 4*c) + 192*I*sqrt(2)*cos(2*d*x + 2*c) - 96*sqrt
(2)*sin(4*d*x + 4*c) - 192*sqrt(2)*sin(2*d*x + 2*c) + 96*I*sqrt(2))*log(2*c
os(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(s
in(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x
 + 2*c), cos(2*d*x + 2*c))) + 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), c
os(2*d*x + 2*c))) + 2) + (-96*I*sqrt(2)*cos(4*d*x + 4*c) - 192*I*sqrt(2)*co
s(2*d*x + 2*c) + 96*sqrt(2)*sin(4*d*x + 4*c) + 192*sqrt(2)*sin(2*d*x + 2*c)
 - 96*I*sqrt(2))*log(2*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sqrt(2)*c
os(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 2*sqrt(2)*sin(1/4*arc
tan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) + (96*I*sqrt(2)*cos(4*d*x +
4*c) + 192*I*sqrt(2)*cos(2*d*x + 2*c) - 96*sqrt(2)*sin(4*d*x + 4*c) - 192*s
qrt(2)*sin(2*d*x + 2*c) + 96*I*sqrt(2))*log(2*cos(1/4*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x +
 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))
+ 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 2) + (-9
6*I*sqrt(2)*cos(4*d*x + 4*c) - 192*I*sqrt(2)*cos(2*d*x + 2*c) + 96*sqrt(2)*
sin(4*d*x + 4*c) + 192*sqrt(2)*sin(2*d*x + 2*c) - 96*I*sqrt(2))*log(2*cos(1
/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)))^2 + 2*sin(1/4*arctan2(sin(2
*d*x + 2*c), cos(2*d*x + 2*c)))^2 - 2*sqrt(2)*cos(1/4*arctan2(sin(2*d*x + 2
*c), cos(2*d*x + 2*c))) - 2*sqrt(2)*sin(1/4*arctan2(sin(2*d*x + 2*c), cos(2
*d*x + 2*c))) + 2) + 512*cos(5/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c)
)) - 1536*cos(1/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) + 512*I*sin(
5/4*arctan2(sin(2*d*x + 2*c), cos(2*d*x + 2*c))) - 1536*I*sin(1/4*arctan2(s
in(2*d*x + 2*c), cos(2*d*x + 2*c))))*sqrt(a)*sqrt(e)/((-1024*I*a*e^4*cos(4*
d*x + 4*c) - 2048*I*a*e^4*cos(2*d*x + 2*c) + 1024*a*e^4*sin(4*d*x + 4*c) +
2048*a*e^4*sin(2*d*x + 2*c) - 1024*I*a*e^4)*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{(e\cos(c+dx))^{7/2}\sqrt{a+a\tan(c+dx)\,1\mathrm{i}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((e*cos(c + d*x))^(7/2)*(a + a*tan(c + d*x)*1i)^(1/2)),x)
```

```
[Out] int(1/((e*cos(c + d*x))^(7/2)*(a + a*tan(c + d*x)*1i)^(1/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*cos(d*x+c))**(7/2)/(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Timed out
```

3.688 $\int (e\cos(c+dx))^m(a+ia\tan(c+dx))^n\,dx$

Optimal. Leaf size=105

$$-\frac{i2^{n-\frac{m}{2}}(a+ia\tan(c+dx))^n(e\cos(c+dx))^m(1+i\tan(c+dx))^{\frac{1}{2}(m-2n)}\,{}_2F_1\left(-\frac{m}{2},\frac{1}{2}(m-2n+2);1-\frac{m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{dm}$$

```
[Out] -I*2^(-1/2*m+n)*(e*cos(d*x+c))^m*hypergeom([-1/2*m, 1+1/2*m-n],[1-1/2*m],1/
2-1/2*I*tan(d*x+c))*(1+I*tan(d*x+c))^(1/2*m-n)*(a+I*a*tan(d*x+c))^n/d/m
```

Rubi [A] time = 0.23, antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = {3515, 3505, 3523, 70, 69}

$$-\frac{i2^{n-\frac{m}{2}}(a+ia\tan(c+dx))^n(e\cos(c+dx))^m(1+i\tan(c+dx))^{\frac{1}{2}(m-2n)}\,{}_2F_1\left(-\frac{m}{2},\frac{1}{2}(m-2n+2);1-\frac{m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{dm}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cos[c + d*x])^m*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] ((-I)*2^(-m/2 + n)*(e*Cos[c + d*x])^m*Hypergeometric2F1[-m/2, (2 + m - 2*n)
/2, 1 - m/2, (1 - I*Tan[c + d*x])/2]*(1 + I*Tan[c + d*x])^((m - 2*n)/2)*(a
+ I*a*Tan[c + d*x])^n)/(d*m)
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
```

```
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\cos(c+dx))^m(a+ia\tan(c+dx))^n\,dx = ((e\cos(c+dx))^m(e\sec(c+dx))^m)\int (e\sec(c+dx))^{-m}(a+ia\tan(c+$$

$$= \left((e\cos(c+dx))^m(a-ia\tan(c+dx))^{m/2}(a+ia\tan(c+dx))^{m/2}\right)\int (a$$

$$= \frac{\left(a^2(e\cos(c+dx))^m(a-ia\tan(c+dx))^{m/2}(a+ia\tan(c+dx))^{m/2}\right)\mathrm{Su}}{d}$$

$$= \frac{\left(2^{-1-\frac{m}{2}+n}a(e\cos(c+dx))^m(a-ia\tan(c+dx))^{m/2}(a+ia\tan(c+dx)\right.}{}$$

$$= -\frac{i2^{-\frac{m}{2}+n}(e\cos(c+dx))^m\,{}_2F_1\left(-\frac{m}{2},\frac{1}{2}(2+m-2n);1-\frac{m}{2};\frac{1}{2}(1-i\tan(\right.}{dm}$$

Mathematica [A] time = 13.32, size = 192, normalized size = 1.83

$$\frac{i2^{n-m}\left(1+e^{2i(c+dx)}\right)\left(e^{idx}\right)^n\left(e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)\right)^m\left(\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}\right)^n\cos^{-m}(c+dx)\sec^{-n}(c+dx)(\cos(dx)+i\sin(dx)}{d(m-2n)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Cos[c + d*x])^m*(a + I*a*Tan[c + d*x])^n,x]
```

```
[Out] (I*2^(-m + n)*(E^(I*d*x))^n*(E^(I*(c + d*x))/(1 + E^((2*I)*(c + d*x))))^n*(
1 + E^((2*I)*(c + d*x)))*((1 + E^((2*I)*(c + d*x)))/E^(I*(c + d*x)))^m*(e*C
os[c + d*x])^m*Hypergeometric2F1[1, (2 + m)/2, 1 - m/2 + n, -E^((2*I)*(c +
d*x))]*(a + I*a*Tan[c + d*x])^n)/(d*(m - 2*n)*Cos[c + d*x]^m*Sec[c + d*x]^n
*(Cos[d*x] + I*Sin[d*x])^n)
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\left(\frac{2\,ae^{(2i\,dx+2i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)^n e^{\left(i\,dmx+i\,cm+m\log(ae)-m\log\left(\frac{2\,ae^{(2i\,dx+2i\,c)}}{e^{(2i\,dx+2i\,c)}+1}\right)\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^m*(a+I*a*tan(d*x+c))^n,x, algorithm="fricas")
```

```
[Out] integral((2*a*e^(2*I*d*x + 2*I*c)/(e^(2*I*d*x + 2*I*c) + 1))^n*e^(I*d*m*x +
 I*c*m + m*log(a*e) - m*log(2*a*e^(2*I*d*x + 2*I*c)/(e^(2*I*d*x + 2*I*c) +
1))), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\cos(dx+c))^m\,(i\,a\tan(dx+c)+a)^n\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^m*(a+I*a*tan(d*x+c))^n,x, algorithm="giac")
```

```
[Out] integrate((e*cos(d*x + c))^m*(I*a*tan(d*x + c) + a)^n, x)
```

maple [F] time = 2.06, size = 0, normalized size = 0.00

$$\int (e\cos (dx+c))^m (a+ia\tan (dx+c))^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^m*(a+I*a*tan(d*x+c))^n,x)
[Out] int((e*cos(d*x+c))^m*(a+I*a*tan(d*x+c))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\cos (dx+c))^m (i\,a\tan (dx+c)+a)^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^m*(a+I*a*tan(d*x+c))^n,x, algorithm="maxima")
[Out] integrate((e*cos(d*x + c))^m*(I*a*tan(d*x + c) + a)^n, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int (e\cos (c+d\,x))^m \left(a+a\tan (c+d\,x)\,1\mathrm{i}\right)^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^n,x)
[Out] int((e*cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^n, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\cos (c+dx))^m (ia(\tan (c+dx)-i))^n \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**m*(a+I*a*tan(d*x+c))**n,x)
[Out] Integral((e*cos(c + d*x))**m*(I*a*(tan(c + d*x) - I))**n, x)
```

3.689 $\int (e\cos(c+dx))^m(a+ia\tan(c+dx))^2\,dx$

Optimal. Leaf size=86

$$-\frac{ia^2 2^{2-\frac{m}{2}}(1+i\tan(c+dx))^{m/2}(e\cos(c+dx))^m\,{}_2F_1\left(\frac{m-2}{2},-\frac{m}{2};1-\frac{m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{dm}$$

```
[Out] -I*2^(2-1/2*m)*a^2*(e*cos(d*x+c))^m*hypergeom([-1/2*m, -1+1/2*m],[1-1/2*m],
1/2-1/2*I*tan(d*x+c))*(1+I*tan(d*x+c))^(1/2*m)/d/m
```

Rubi [A] time = 0.22, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {3515, 3505, 3523, 70, 69}

$$-\frac{ia^2 2^{2-\frac{m}{2}}(1+i\tan(c+dx))^{m/2}(e\cos(c+dx))^m\,{}_2F_1\left(\frac{m-2}{2},-\frac{m}{2};1-\frac{m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{dm}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cos[c + d*x])^m*(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] ((-I)*2^(2 - m/2)*a^2*(e*Cos[c + d*x])^m*Hypergeometric2F1[(-2 + m)/2, -m/2
, 1 - m/2, (1 - I*Tan[c + d*x])/2]*(1 + I*Tan[c + d*x])^(m/2))/(d*m)
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
```

```
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\cos(c+dx))^m(a+ia\tan(c+dx))^2\,dx = ((e\cos(c+dx))^m(e\sec(c+dx))^m)\int (e\sec(c+dx))^{-m}(a+ia\tan($$
$$= \left((e\cos(c+dx))^m(a-ia\tan(c+dx))^{m/2}(a+ia\tan(c+dx))^{m/2}\right)\int$$
$$= \frac{\left(a^2(e\cos(c+dx))^m(a-ia\tan(c+dx))^{m/2}(a+ia\tan(c+dx))^{m/2}\right)}{d}$$
$$= \frac{\left(2^{1-\frac{m}{2}}a^3(e\cos(c+dx))^m(a-ia\tan(c+dx))^{m/2}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{m/2}\right)}{d}$$
$$= -\frac{i2^{2-\frac{m}{2}}a^2(e\cos(c+dx))^m\,{}_2F_1\left(\frac{1}{2}(-2+m),-\frac{m}{2};1-\frac{m}{2};\frac{1}{2}(1-i\tan(\right.}{dm}$$

Mathematica [A] time = 1.69, size = 125, normalized size = 1.45

$$-\frac{ia^2 2^{2-m}e^{i(c+dx)}\left(e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)\right)^{m-1}(\tan(c+dx)-i)^2\,{}_2F_1\left(1,\frac{m+2}{2};3-\frac{m}{2};-e^{2i(c+dx)}\right)\cos^{2-m}(c+dx)(e\,c}{d(m-4)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Cos[c + d*x])^m*(a + I*a*Tan[c + d*x])^2,x]
[Out] ((-I)*2^(2 - m)*a^2*E^(I*(c + d*x))*((1 + E^((2*I)*(c + d*x)))/E^(I*(c + d*
x)))^(-1 + m)*Cos[c + d*x]^(2 - m)*(e*Cos[c + d*x])^m*Hypergeometric2F1[1,
(2 + m)/2, 3 - m/2, -E^((2*I)*(c + d*x))]*(-I + Tan[c + d*x])^2)/(d*(-4 + m
))
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{4\left(\frac{1}{2}\left(ee^{(2i\,dx+2i\,c)}+e\right)e^{(-i\,dx-i\,c)}\right)^m a^2e^{(4i\,dx+4i\,c)}}{e^{(4i\,dx+4i\,c)}+2\,e^{(2i\,dx+2i\,c)}+1},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^m*(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
[Out] integral(4*(1/2*(e*e^(2*I*d*x + 2*I*c) + e)*e^(-I*d*x - I*c))^m*a^2*e^(4*I*
d*x + 4*I*c)/(e^(4*I*d*x + 4*I*c) + 2*e^(2*I*d*x + 2*I*c) + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^2(e\cos(dx+c))^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^m*(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
[Out] integrate((I*a*tan(d*x + c) + a)^2*(e*cos(d*x + c))^m, x)
```

maple [F] time = 1.54, size = 0, normalized size = 0.00

$$\int (e\cos(dx+c))^m(a+ia\tan(dx+c))^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^m*(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] int((e*cos(d*x+c))^m*(a+I*a*tan(d*x+c))^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)^2\,(e\cos(dx+c))^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^m*(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)^2*(e*cos(d*x + c))^m, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int (e\,\cos(c+d\,x))^m\,(a+a\tan(c+d\,x)\,1\mathrm{i})^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] int((e*cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-a^2\left(\int\left(-(e\cos(c+dx))^m\right)dx+\int(e\cos(c+dx))^m\tan^2(c+dx)\,dx+\int\left(-2i\,(e\cos(c+dx))^m\tan(c+dx)\right)d$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**m*(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -a**2*(Integral(-(e*cos(c + d*x))**m, x) + Integral((e*cos(c + d*x))**m*tan
(c + d*x)**2, x) + Integral(-2*I*(e*cos(c + d*x))**m*tan(c + d*x), x))
```

3.690 $\int (e\cos(c+dx))^m(a+ia\tan(c+dx))\,dx$

Optimal. Leaf size=82

$$-\frac{ia2^{1-\frac{m}{2}}(1+i\tan(c+dx))^{m/2}(e\cos(c+dx))^m\,{}_2F_1\left(-\frac{m}{2},\frac{m}{2};1-\frac{m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{dm}$$

```
[Out] -I*2^(1-1/2*m)*a*(e*cos(d*x+c))^m*hypergeom([1/2*m, -1/2*m],[1-1/2*m],1/2-1
/2*I*tan(d*x+c))*(1+I*tan(d*x+c))^(1/2*m)/d/m
```

Rubi [A] time = 0.17, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.208$, Rules used = {3515, 3505, 3523, 70, 69}

$$-\frac{ia2^{1-\frac{m}{2}}(1+i\tan(c+dx))^{m/2}(e\cos(c+dx))^m\,{}_2F_1\left(-\frac{m}{2},\frac{m}{2};1-\frac{m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{dm}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cos[c + d*x])^m*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((-I)*2^(1 - m/2)*a*(e*Cos[c + d*x])^m*Hypergeometric2F1[-m/2, m/2, 1 - m/2
, (1 - I*Tan[c + d*x])/2]*(1 + I*Tan[c + d*x])^(m/2))/(d*m)
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
```

```
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\cos(c+dx))^m(a+ia\tan(c+dx))\,dx = ((e\cos(c+dx))^m(e\sec(c+dx))^m)\int (e\sec(c+dx))^{-m}(a+ia\tan(c+$$
$$= \left((e\cos(c+dx))^m(a-ia\tan(c+dx))^{m/2}(a+ia\tan(c+dx))^{m/2}\right)\int (a-$$
$$= \frac{\left(a^2(e\cos(c+dx))^m(a-ia\tan(c+dx))^{m/2}(a+ia\tan(c+dx))^{m/2}\right)\text{Sub}}{d}$$
$$= \frac{\left(2^{-m/2}a^2(e\cos(c+dx))^m(a-ia\tan(c+dx))^{m/2}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{m/2}\right)\text{Su}}{d}$$
$$= -\frac{i2^{1-\frac{m}{2}}a(e\cos(c+dx))^m\,{}_2F_1\left(-\frac{m}{2},\frac{m}{2};1-\frac{m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(1+}{dm}$$

Mathematica [A] time = 8.10, size = 131, normalized size = 1.60

$$-\frac{a2^{1-m}e^{i(c+2dx)}\left(e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)\right)^m(\tan(c+dx)-i)(\cos(dx)-i\sin(dx))\,{}_2F_1\left(1,\frac{m+2}{2};2-\frac{m}{2};-e^{2i(c+dx)}\right)\cos^{1-}}{d(m-2)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Cos[c + d*x])^m*(a + I*a*Tan[c + d*x]),x]
```

```
[Out] -((2^(1 - m)*a*E^(I*(c + 2*d*x))*((1 + E^((2*I)*(c + d*x)))/E^(I*(c + d*x))
)^m*Cos[c + d*x]^(1 - m)*(e*Cos[c + d*x])^m*Hypergeometric2F1[1, (2 + m)/2,
 2 - m/2, -E^((2*I)*(c + d*x))]*(Cos[d*x] - I*Sin[d*x])*(-I + Tan[c + d*x])
)/(d*(-2 + m)))
```

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{2\left(\frac{1}{2}\left(ee^{(2i\,dx+2i\,c)}+e\right)e^{(-i\,dx-i\,c)}\right)^m ae^{(2i\,dx+2i\,c)}}{e^{(2i\,dx+2i\,c)}+1},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^m*(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] integral(2*(1/2*(e*e^(2*I*d*x + 2*I*c) + e)*e^(-I*d*x - I*c))^m*a*e^(2*I*d*
x + 2*I*c)/(e^(2*I*d*x + 2*I*c) + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)\,(e\cos(dx+c))^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^m*(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((I*a*tan(d*x + c) + a)*(e*cos(d*x + c))^m, x)
```

maple [F] time = 1.60, size = 0, normalized size = 0.00

$$\int (e\cos(dx+c))^m\,(a+ia\tan(dx+c))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^m*(a+I*a*tan(d*x+c)),x)
[Out] int((e*cos(d*x+c))^m*(a+I*a*tan(d*x+c)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (i\,a\tan(dx+c)+a)\,(e\cos(dx+c))^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^m*(a+I*a*tan(d*x+c)),x, algorithm="maxima")
[Out] integrate((I*a*tan(d*x + c) + a)*(e*cos(d*x + c))^m, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int (e\,\cos(c+d\,x))^m\,\left(a+a\tan(c+d\,x)\,1\mathrm{i}\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^m*(a + a*tan(c + d*x)*1i),x)
[Out] int((e*cos(c + d*x))^m*(a + a*tan(c + d*x)*1i), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$ia\left(\int \left(-i\,(e\cos(c+dx))^m\right)dx + \int (e\cos(c+dx))^m\tan(c+dx)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**m*(a+I*a*tan(d*x+c)),x)
[Out] I*a*(Integral(-I*(e*cos(c + d*x))**m, x) + Integral((e*cos(c + d*x))**m*tan
(c + d*x), x))
```

3.691 $\int \frac{(e\cos(c+dx))^m}{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=86

$$-\frac{i2^{-\frac{m}{2}-1}(1+i\tan(c+dx))^{m/2}(e\cos(c+dx))^m\,{}_2F_1\left(-\frac{m}{2},\frac{m+4}{2};1-\frac{m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{adm}$$

```
[Out] -I*2^(-1-1/2*m)*(e*cos(d*x+c))^m*hypergeom([-1/2*m, 2+1/2*m],[1-1/2*m],1/2-
1/2*I*tan(d*x+c))*(1+I*tan(d*x+c))^(1/2*m)/a/d/m
```

Rubi [A] time = 0.24, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {3515, 3505, 3523, 70, 69}

$$-\frac{i2^{-\frac{m}{2}-1}(1+i\tan(c+dx))^{m/2}(e\cos(c+dx))^m\,{}_2F_1\left(-\frac{m}{2},\frac{m+4}{2};1-\frac{m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{adm}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cos[c + d*x])^m/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] ((-I)*2^(-1 - m/2)*(e*Cos[c + d*x])^m*Hypergeometric2F1[-m/2, (4 + m)/2, 1
 - m/2, (1 - I*Tan[c + d*x])/2]*(1 + I*Tan[c + d*x])^(m/2))/(a*d*m)
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
```

```
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(e\cos(c+dx))^m}{a+ia\tan(c+dx)}\,dx = ((e\cos(c+dx))^m(e\sec(c+dx))^m)\int \frac{(e\sec(c+dx))^{-m}}{a+ia\tan(c+dx)}\,dx$$
$$= \left((e\cos(c+dx))^m(a-ia\tan(c+dx))^{m/2}(a+ia\tan(c+dx))^{m/2}\right)\int (a-ia\tan(c+dx$$
$$= \frac{\left(a^2(e\cos(c+dx))^m(a-ia\tan(c+dx))^{m/2}(a+ia\tan(c+dx))^{m/2}\right)\text{Subst}\left(\int (a-iax\right.}{d}$$
$$= \frac{\left(2^{-2-\frac{m}{2}}(e\cos(c+dx))^m(a-ia\tan(c+dx))^{m/2}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{m/2}\right)\text{Subst}\left(\int \left(\frac{1}{2}+\frac{ix}{2}\right)\right.}{d}$$
$$= -\frac{i2^{-1-\frac{m}{2}}(e\cos(c+dx))^m\,{}_2F_1\left(-\frac{m}{2},\frac{4+m}{2};1-\frac{m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(1+i\tan(c+d}{adm}$$

Mathematica [A] time = 60.05, size = 147, normalized size = 1.71

$$\frac{2^{-m-1}e^{-i(c+2dx)}\left(1+e^{2i(c+dx)}\right)^2\left(e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)\right)^m(\cos(dx)+i\sin(dx))\,{}_2F_1\left(1,\frac{m+2}{2};-\frac{m}{2};-e^{2i(c+dx)}\right)\cos^{-m-}}{ad(m+2)(\tan(c+dx)-i)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Cos[c + d*x])^m/(a + I*a*Tan[c + d*x]),x]
```

```
[Out] (2^(-1 - m)*(1 + E^((2*I)*(c + d*x)))^2*((1 + E^((2*I)*(c + d*x)))/E^(I*(c
+ d*x)))^m*Cos[c + d*x]^(-1 - m)*(e*Cos[c + d*x])^m*Hypergeometric2F1[1, (2
 + m)/2, -1/2*m, -E^((2*I)*(c + d*x))]*(Cos[d*x] + I*Sin[d*x]))/(a*d*E^(I*(
c + 2*d*x))*(2 + m)*(-I + Tan[c + d*x]))
```

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(\frac{1}{2}\left(ee^{(2i\,dx+2i\,c)}+e\right)e^{(-i\,dx-i\,c)}\right)^m\left(e^{(2i\,dx+2i\,c)}+1\right)e^{(-2i\,dx-2i\,c)}}{2\,a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^m/(a+I*a*tan(d*x+c)),x, algorithm="fricas")
```

```
[Out] integral(1/2*(1/2*(e*e^(2*I*d*x + 2*I*c) + e)*e^(-I*d*x - I*c))^m*(e^(2*I*d
*x + 2*I*c) + 1)*e^(-2*I*d*x - 2*I*c)/a, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cos(dx+c))^m}{i\,a\tan(dx+c)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^m/(a+I*a*tan(d*x+c)),x, algorithm="giac")
```

```
[Out] integrate((e*cos(d*x + c))^m/(I*a*tan(d*x + c) + a), x)
```

maple [F] time = 2.38, size = 0, normalized size = 0.00

$$\int \frac{(e\cos(dx+c))^m}{a+ia\tan(dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^m/(a+I*a*tan(d*x+c)),x)
```

```
[Out] int((e*cos(d*x+c))^m/(a+I*a*tan(d*x+c)),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^m/(a+I*a*tan(d*x+c)),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(e\,\cos(c+d\,x))^m}{a+a\tan(c+d\,x)\,1\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^m/(a + a*tan(c + d*x)*1i),x)
```

```
[Out] int((e*cos(c + d*x))^m/(a + a*tan(c + d*x)*1i), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\int \frac{(e\cos(c+dx))^m}{\tan(c+dx)-i}\,dx}{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**m/(a+I*a*tan(d*x+c)),x)
```

```
[Out] -I*Integral((e*cos(c + d*x))**m/(tan(c + d*x) - I), x)/a
```

3.692 $\int \frac{(e\cos(c+dx))^m}{(a+ia\tan(c+dx))^2}\,dx$

Optimal. Leaf size=86

$$-\frac{i2^{-\frac{m}{2}-2}(1+i\tan(c+dx))^{m/2}(e\cos(c+dx))^m\,{}_2F_1\left(-\frac{m}{2},\frac{m+6}{2};1-\frac{m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{a^2dm}$$

```
[Out] -I*2^(-2-1/2*m)*(e*cos(d*x+c))^m*hypergeom([-1/2*m, 3+1/2*m],[1-1/2*m],1/2-
1/2*I*tan(d*x+c))*(1+I*tan(d*x+c))^(1/2*m)/a^2/d/m
```

Rubi [A] time = 0.24, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.192$, Rules used = {3515, 3505, 3523, 70, 69}

$$-\frac{i2^{-\frac{m}{2}-2}(1+i\tan(c+dx))^{m/2}(e\cos(c+dx))^m\,{}_2F_1\left(-\frac{m}{2},\frac{m+6}{2};1-\frac{m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{a^2dm}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cos[c + d*x])^m/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] ((-I)*2^(-2 - m/2)*(e*Cos[c + d*x])^m*Hypergeometric2F1[-m/2, (6 + m)/2, 1
- m/2, (1 - I*Tan[c + d*x])/2]*(1 + I*Tan[c + d*x])^(m/2))/(a^2*d*m)
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
```

```
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(e\cos(c+dx))^m}{(a+ia\tan(c+dx))^2}\,dx = ((e\cos(c+dx))^m(e\sec(c+dx))^m)\int \frac{(e\sec(c+dx))^{-m}}{(a+ia\tan(c+dx))^2}\,dx$$
$$= \left((e\cos(c+dx))^m(a-ia\tan(c+dx))^{m/2}(a+ia\tan(c+dx))^{m/2}\right)\int (a-ia\tan(c+dx$$
$$= \frac{\left(a^2(e\cos(c+dx))^m(a-ia\tan(c+dx))^{m/2}(a+ia\tan(c+dx))^{m/2}\right)\mathrm{Subst}\left(\int (a-iax)\right.}{d}$$
$$= \frac{\left(2^{-3-\frac{m}{2}}(e\cos(c+dx))^m(a-ia\tan(c+dx))^{m/2}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{m/2}\right)\mathrm{Subst}\left(\int\left(\frac{1}{2}+\frac{ix}{2}\right)\right.}{ad}$$
$$= -\frac{i2^{-2-\frac{m}{2}}(e\cos(c+dx))^m\,{}_2F_1\left(-\frac{m}{2},\frac{6+m}{2};1-\frac{m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(1+i\tan(c+dx}{a^2dm}$$

Mathematica [A] time = 71.09, size = 154, normalized size = 1.79

$$-\frac{i2^{-m-2}e^{-2i(c+2dx)}\left(1+e^{2i(c+dx)}\right)^3\left(e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)\right)^m(\cos(dx)+i\sin(dx))^2\,{}_2F_1\left(1,\frac{m+2}{2};-\frac{m}{2}-1;-e^{2i(c+dx)}\right)\mathrm{co}}{a^2d(m+4)(\tan(c+dx)-i)^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Cos[c + d*x])^m/(a + I*a*Tan[c + d*x])^2,x]
```

```
[Out] ((-I)*2^(-2 - m)*(1 + E^((2*I)*(c + d*x)))^3*((1 + E^((2*I)*(c + d*x)))/E^(
I*(c + d*x)))^m*Cos[c + d*x]^(-2 - m)*(e*Cos[c + d*x])^m*Hypergeometric2F1[
1, (2 + m)/2, -1 - m/2, -E^((2*I)*(c + d*x))]*(Cos[d*x] + I*Sin[d*x])^2)/(a
^2*d*E^((2*I)*(c + 2*d*x))*(4 + m)*(-I + Tan[c + d*x])^2)
```

fricas [F] time = 0.61, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\left(\frac{1}{2}\left(ee^{(2i\,dx+2i\,c)}+e\right)e^{(-i\,dx-i\,c)}\right)^m\left(e^{(4i\,dx+4i\,c)}+2\,e^{(2i\,dx+2i\,c)}+1\right)e^{(-4i\,dx-4i\,c)}}{4\,a^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^m/(a+I*a*tan(d*x+c))^2,x, algorithm="fricas")
```

```
[Out] integral(1/4*(1/2*(e*e^(2*I*d*x + 2*I*c) + e)*e^(-I*d*x - I*c))^m*(e^(4*I*d
*x + 4*I*c) + 2*e^(2*I*d*x + 2*I*c) + 1)*e^(-4*I*d*x - 4*I*c)/a^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cos(dx+c))^m}{(i\,a\tan(dx+c)+a)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^m/(a+I*a*tan(d*x+c))^2,x, algorithm="giac")
```

```
[Out] integrate((e*cos(d*x + c))^m/(I*a*tan(d*x + c) + a)^2, x)
```

maple [F] time = 4.94, size = 0, normalized size = 0.00

$$\int \frac{(e\cos(dx+c))^m}{(a+ia\tan(dx+c))^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^m/(a+I*a*tan(d*x+c))^2,x)
```

```
[Out] int((e*cos(d*x+c))^m/(a+I*a*tan(d*x+c))^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^m/(a+I*a*tan(d*x+c))^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(e\,\cos(c+d\,x))^m}{(a+a\tan(c+d\,x)\,1\mathrm{i})^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^m/(a + a*tan(c + d*x)*1i)^2,x)
```

```
[Out] int((e*cos(c + d*x))^m/(a + a*tan(c + d*x)*1i)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{(e\cos(c+dx))^m}{\tan^2(c+dx)-2i\tan(c+dx)-1}\,dx}{a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**m/(a+I*a*tan(d*x+c))**2,x)
```

```
[Out] -Integral((e*cos(c + d*x))**m/(tan(c + d*x)**2 - 2*I*tan(c + d*x) - 1), x)/
a**2
```

3.693 $\int (e\cos(c+dx))^m\sqrt{a+ia\tan(c+dx)}\,dx$

Optimal. Leaf size=105

$$-\frac{ia2^{\frac{1}{2}-\frac{m}{2}}(1+i\tan(c+dx))^{\frac{m+1}{2}}(e\cos(c+dx))^m\,{}_2F_1\left(-\frac{m}{2},\frac{m+1}{2};1-\frac{m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{dm\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] -I*2^(1/2-1/2*m)*a*(e*cos(d*x+c))^m*hypergeom([-1/2*m, 1/2+1/2*m],[1-1/2*m]
,1/2-1/2*I*tan(d*x+c))*(1+I*tan(d*x+c))^(1/2+1/2*m)/d/m/(a+I*a*tan(d*x+c))^
(1/2)
```

Rubi [A] time = 0.29, antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {3515, 3505, 3523, 70, 69}

$$-\frac{ia2^{\frac{1}{2}-\frac{m}{2}}(1+i\tan(c+dx))^{\frac{m+1}{2}}(e\cos(c+dx))^m\,{}_2F_1\left(-\frac{m}{2},\frac{m+1}{2};1-\frac{m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{dm\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cos[c + d*x])^m*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((-I)*2^(1/2 - m/2)*a*(e*Cos[c + d*x])^m*Hypergeometric2F1[-m/2, (1 + m)/2,
 1 - m/2, (1 - I*Tan[c + d*x])/2]*(1 + I*Tan[c + d*x])^((1 + m)/2))/(d*m*Sq
rt[a + I*a*Tan[c + d*x]])
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int (e\cos(c+dx))^m\sqrt{a+ia\tan(c+dx)}\,dx = ((e\cos(c+dx))^m(e\sec(c+dx))^m)\int (e\sec(c+dx))^{-m}\sqrt{a+ia\tan$$

$$= \left((e\cos(c+dx))^m(a-ia\tan(c+dx))^{m/2}(a+ia\tan(c+dx))^{m/2}\right)\int$$

$$= \frac{\left(a^2(e\cos(c+dx))^m(a-ia\tan(c+dx))^{m/2}(a+ia\tan(c+dx))^{m/2}\right)}{d}$$

$$= \frac{\left(2^{-\frac{1}{2}-\frac{m}{2}}a^2(e\cos(c+dx))^m(a-ia\tan(c+dx))^{m/2}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{\frac{1}{2}+}\right.}{d\sqrt{a+ia\tan(}}$$

$$= -\frac{i2^{\frac{1}{2}-\frac{m}{2}}a(e\cos(c+dx))^m\,{}_2F_1\left(-\frac{m}{2},\frac{1+m}{2};1-\frac{m}{2};\frac{1}{2}(1-i\tan(c+dx)\right.}{dm\sqrt{a+ia\tan(c+dx)}}$$

Mathematica [A] time = 0.88, size = 106, normalized size = 1.01

$$\frac{i2^{-m}\left(1+e^{2i(c+dx)}\right)\sqrt{a+ia\tan(c+dx)}\left(ee^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)\right)^m\,{}_2F_1\left(1,\frac{m+2}{2};\frac{3-m}{2};-e^{2i(c+dx)}\right)}{d(m-1)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Cos[c + d*x])^m*Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (I*(1 + E^((2*I)*(c + d*x)))*((e*(1 + E^((2*I)*(c + d*x))))/E^(I*(c + d*x))
)^m*Hypergeometric2F1[1, (2 + m)/2, (3 - m)/2, -E^((2*I)*(c + d*x))]*Sqrt[a
 + I*a*Tan[c + d*x]])/(2^m*d*(-1 + m))
```

fricas [F] time = 0.56, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{2}\left(\frac{1}{2}\left(ee^{(2i\,dx+2i\,c)}+e\right)e^{(-i\,dx-i\,c)}\right)^m\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\,e^{(i\,dx+i\,c)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^m*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(2)*(1/2*(e*e^(2*I*d*x + 2*I*c) + e)*e^(-I*d*x - I*c))^m*sqrt(
a/(e^(2*I*d*x + 2*I*c) + 1))*e^(I*d*x + I*c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{i\,a\tan\left(dx+c\right)+a}\,\left(e\cos\left(dx+c\right)\right)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^m*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)*(e*cos(d*x + c))^m, x)
```

maple [F] time = 1.47, size = 0, normalized size = 0.00

$$\int (e\cos(dx+c))^m \sqrt{a+ia\tan(dx+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^m*(a+I*a*tan(d*x+c))^(1/2),x)
```

```
[Out] int((e*cos(d*x+c))^m*(a+I*a*tan(d*x+c))^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{i\,a\tan(dx+c)+a}\,(e\cos(dx+c))^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^m*(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(I*a*tan(d*x + c) + a)*(e*cos(d*x + c))^m, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int (e\,\cos(c+d\,x))^m\,\sqrt{a+a\tan(c+d\,x)\,1\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^(1/2),x)
```

```
[Out] int((e*cos(c + d*x))^m*(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (e\cos(c+dx))^m \sqrt{ia(\tan(c+dx)-i)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**m*(a+I*a*tan(d*x+c))**(1/2),x)
```

```
[Out] Integral((e*cos(c + d*x))**m*sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.694 $\int \frac{(e\cos(c+dx))^m}{\sqrt{a+ia\tan(c+dx)}}\,dx$

Optimal. Leaf size=104

$$-\frac{i2^{-\frac{m}{2}-\frac{1}{2}}(1+i\tan(c+dx))^{\frac{m+1}{2}}(e\cos(c+dx))^m\,{}_2F_1\left(-\frac{m}{2},\frac{m+3}{2};1-\frac{m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{dm\sqrt{a+ia\tan(c+dx)}}$$

```
[Out] -I*2^(-1/2-1/2*m)*(e*cos(d*x+c))^m*hypergeom([-1/2*m, 3/2+1/2*m],[1-1/2*m],
1/2-1/2*I*tan(d*x+c))*(1+I*tan(d*x+c))^(1/2+1/2*m)/d/m/(a+I*a*tan(d*x+c))^(
1/2)
```

Rubi [A] time = 0.29, antiderivative size = 104, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 28, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.179, Rules used = {3515, 3505, 3523, 70, 69}

$$-\frac{i2^{-\frac{m}{2}-\frac{1}{2}}(1+i\tan(c+dx))^{\frac{m+1}{2}}(e\cos(c+dx))^m\,{}_2F_1\left(-\frac{m}{2},\frac{m+3}{2};1-\frac{m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)}{dm\sqrt{a+ia\tan(c+dx)}}$$

Antiderivative was successfully verified.

```
[In] Int[(e*Cos[c + d*x])^m/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] ((-I)*2^(-1/2 - m/2)*(e*Cos[c + d*x])^m*Hypergeometric2F1[-m/2, (3 + m)/2,
1 - m/2, (1 - I*Tan[c + d*x])/2]*(1 + I*Tan[c + d*x])^((1 + m)/2))/(d*m*Sqr
t[a + I*a*Tan[c + d*x]])
```

Rule 69

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a + b*x))/(b*c -
 a*d))])/(b*(m + 1)*(b/(b*c - a*d))^n), x] /; FreeQ[{a, b, c, d, m, n}, x]
&& NeQ[b*c - a*d, 0] &&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[b/(b*c - a*d)
, 0] && (RationalQ[m] ||  !(RationalQ[n] && GtQ[-(d/(b*c - a*d)), 0]))
```

Rule 70

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Dist[(c
 + d*x)^FracPart[n]/((b/(b*c - a*d))^IntPart[n]*((b*(c + d*x))/(b*c - a*d))
^FracPart[n]), Int[(a + b*x)^m*Simp[(b*c)/(b*c - a*d) + (b*d*x)/(b*c - a*d)
, x]^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] &&  !In
tegerQ[m] &&  !IntegerQ[n] && (RationalQ[m] ||  !SimplerQ[n + 1, m + 1])
```

Rule 3505

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_.), x_Symbol] :> Dist[(d*Sec[e + f*x])^m/((a + b*Tan[e + f*x])^(m/
2)*(a - b*Tan[e + f*x])^(m/2)), Int[(a + b*Tan[e + f*x])^(m/2 + n)*(a - b*T
an[e + f*x])^(m/2), x], x] /; FreeQ[{a, b, d, e, f, m, n}, x] && EqQ[a^2 +
b^2, 0]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rule 3523

```
Int[((a_) + (b_.)*tan[(e_.) + (f_.)*(x_)])^(m_)*((c_) + (d_.)*tan[(e_.) + (
f_.)*(x_)])^(n_), x_Symbol] :> Dist[(a*c)/f, Subst[Int[(a + b*x)^(m - 1)*(c
 + d*x)^(n - 1), x], x, Tan[e + f*x]], x] /; FreeQ[{a, b, c, d, e, f, m, n}
, x] && EqQ[b*c + a*d, 0] && EqQ[a^2 + b^2, 0]
```

Rubi steps

$$\int \frac{(e\cos(c+dx))^m}{\sqrt{a+ia\tan(c+dx)}}\,dx = ((e\cos(c+dx))^m(e\sec(c+dx))^m)\int \frac{(e\sec(c+dx))^{-m}}{\sqrt{a+ia\tan(c+dx)}}\,dx$$

$$= \left((e\cos(c+dx))^m(a-ia\tan(c+dx))^{m/2}(a+ia\tan(c+dx))^{m/2}\right)\int (a-ia\tan(c+dx$$

$$= \frac{\left(a^2(e\cos(c+dx))^m(a-ia\tan(c+dx))^{m/2}(a+ia\tan(c+dx))^{m/2}\right)\text{Subst}\left(\int (a-iax)\right.}{d}$$

$$= \frac{\left(2^{-\frac{3}{2}-\frac{m}{2}}a(e\cos(c+dx))^m(a-ia\tan(c+dx))^{m/2}\left(\frac{a+ia\tan(c+dx)}{a}\right)^{\frac{1}{2}+\frac{m}{2}}\right)\text{Subst}\left(\int\left(\frac{1}{2}+\frac{ix}{2}\right.\right.}{d\sqrt{a+ia\tan(c+dx)}}$$

$$= -\frac{i2^{-\frac{1}{2}-\frac{m}{2}}(e\cos(c+dx))^m\,{}_2F_1\left(-\frac{m}{2},\frac{3+m}{2};1-\frac{m}{2};\frac{1}{2}(1-i\tan(c+dx))\right)(1+i\tan(c+dx}{dm\sqrt{a+ia\tan(c+dx)}}$$

Mathematica [A] time = 15.63, size = 143, normalized size = 1.38

$$\frac{i4^{-m}\left(1+e^{2i(c+dx)}\right)\left(e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)\right)^m\left(ee^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)\right)^m{}_2F_1\left(1,\frac{m+2}{2};\frac{1-m}{2};-e^{2i(c+dx)}\right)\cos^{-m}(c+dx)}{d(m+1)\sqrt{a+ia\tan(c+dx)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(e*Cos[c + d*x])^m/Sqrt[a + I*a*Tan[c + d*x]],x]
```

```
[Out] (I*(1 + E^((2*I)*(c + d*x)))*((1 + E^((2*I)*(c + d*x)))/E^(I*(c + d*x)))^m*
((e*(1 + E^((2*I)*(c + d*x))))/E^(I*(c + d*x)))^m*Hypergeometric2F1[1, (2 +
 m)/2, (1 - m)/2, -E^((2*I)*(c + d*x))])/(4^m*d*(1 + m)*Cos[c + d*x]^m*Sqrt
[a + I*a*Tan[c + d*x]])
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{2}\left(\frac{1}{2}\left(ee^{(2i\,dx+2i\,c)}+e\right)e^{(-i\,dx-i\,c)}\right)^m\sqrt{\frac{a}{e^{(2i\,dx+2i\,c)}+1}}\left(e^{(2i\,dx+2i\,c)}+1\right)e^{(-i\,dx-i\,c)}}{2\,a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^m/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="fricas")
```

```
[Out] integral(1/2*sqrt(2)*(1/2*(e*e^(2*I*d*x + 2*I*c) + e)*e^(-I*d*x - I*c))^m*s
qrt(a/(e^(2*I*d*x + 2*I*c) + 1))*(e^(2*I*d*x + 2*I*c) + 1)*e^(-I*d*x - I*c)
/a, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cos(dx+c))^m}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^m/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="giac")
[Out] integrate((e*cos(d*x + c))^m/sqrt(I*a*tan(d*x + c) + a), x)
```

maple [F] time = 1.40, size = 0, normalized size = 0.00

$$\int \frac{(e\cos(dx+c))^m}{\sqrt{a+ia\tan(dx+c)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(d*x+c))^m/(a+I*a*tan(d*x+c))^(1/2),x)
[Out] int((e*cos(d*x+c))^m/(a+I*a*tan(d*x+c))^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cos(dx+c))^m}{\sqrt{i\,a\tan(dx+c)+a}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))^m/(a+I*a*tan(d*x+c))^(1/2),x, algorithm="maxima")
[Out] integrate((e*cos(d*x + c))^m/sqrt(I*a*tan(d*x + c) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(e\,\cos(c+d\,x))^m}{\sqrt{a+a\tan(c+d\,x)\,1\mathrm{i}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*cos(c + d*x))^m/(a + a*tan(c + d*x)*1i)^(1/2),x)
[Out] int((e*cos(c + d*x))^m/(a + a*tan(c + d*x)*1i)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(e\cos(c+dx))^m}{\sqrt{ia(\tan(c+dx)-i)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*cos(d*x+c))**m/(a+I*a*tan(d*x+c))**(1/2),x)
[Out] Integral((e*cos(c + d*x))**m/sqrt(I*a*(tan(c + d*x) - I)), x)
```

3.695 $\int (d\cos(e+fx))^m(a+b\tan(e+fx))^3\,dx$

Optimal. Leaf size=183

$$-\frac{a\left(3b^2-a^2(1-m)\right)\tan(e+fx)\sec^2(e+fx)^{m/2}(d\cos(e+fx))^m\,{}_2F_1\left(\frac{1}{2},\frac{m+2}{2};\frac{3}{2};-\tan^2(e+fx)\right)}{f(1-m)}+\frac{b(d\cos(e+fx}{}$$

```
[Out] -a*(3*b^2-a^2*(1-m))*(d*cos(f*x+e))^m*hypergeom([1/2, 1+1/2*m],[3/2],-tan(f
*x+e)^2)*(sec(f*x+e)^2)^(1/2*m)*tan(f*x+e)/f/(1-m)+b*(d*cos(f*x+e))^m*(a+b*
tan(f*x+e))^2/f/(2-m)+b*(d*cos(f*x+e))^m*(2*(b^2-a^2*(3-m))*(1-m)+a*b*(4-m)
*m*tan(f*x+e))/f/(1-m)/(2-m)/m
```

Rubi [A] time = 0.29, antiderivative size = 175, normalized size of antiderivative = 0.96, number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {3515, 3512, 743, 780, 245}

$$\frac{a\left(a^2-\frac{3b^2}{1-m}\right)\tan(e+fx)\sec^2(e+fx)^{m/2}(d\cos(e+fx))^m\,{}_2F_1\left(\frac{1}{2},\frac{m+2}{2};\frac{3}{2};-\tan^2(e+fx)\right)}{f}+\frac{b(d\cos(e+fx))^m\left(2(1\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Cos[e + f*x])^m*(a + b*Tan[e + f*x])^3,x]
```

```
[Out] (a*(a^2 - (3*b^2)/(1 - m))*(d*Cos[e + f*x])^m*Hypergeometric2F1[1/2, (2 + m
)/2, 3/2, -Tan[e + f*x]^2]*(Sec[e + f*x]^2)^(m/2)*Tan[e + f*x])/f + (b*(d*C
os[e + f*x])^m*(a + b*Tan[e + f*x])^2)/(f*(2 - m)) + (b*(d*Cos[e + f*x])^m*
(2*(b^2 - a^2*(3 - m))*(1 - m) + a*b*(4 - m)*m*Tan[e + f*x]))/(f*m*(2 - 3*m
 + m^2))
```

Rule 245

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[a^p*x*Hypergeometric2F
1[-p, 1/n, 1/n + 1, -((b*x^n)/a)], x] /; FreeQ[{a, b, n, p}, x] &&  !IGtQ[p
, 0] &&  !IntegerQ[1/n] &&  !ILtQ[Simplify[1/n + p], 0] && (IntegerQ[p] ||
GtQ[a, 0])
```

Rule 743

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Simp[
(e*(d + e*x)^(m - 1)*(a + c*x^2)^(p + 1))/(c*(m + 2*p + 1)), x] + Dist[1/(c
*(m + 2*p + 1)), Int[(d + e*x)^(m - 2)*Simp[c*d^2*(m + 2*p + 1) - a*e^2*(m
- 1) + 2*c*d*e*(m + p)*x, x]*(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, m,
 p}, x] && NeQ[c*d^2 + a*e^2, 0] && If[RationalQ[m], GtQ[m, 1], SumSimplerQ
[m, -2]] && NeQ[m + 2*p + 1, 0] && IntQuadraticQ[a, 0, c, d, e, m, p, x]
```

Rule 780

```
Int[((d_.) + (e_.)*(x_))*((f_.) + (g_.)*(x_))*((a_) + (c_.)*(x_)^2)^(p_), x
_Symbol] :> Simp[(((e*f + d*g)*(2*p + 3) + 2*e*g*(p + 1)*x)*(a + c*x^2)^(p
+ 1))/(2*c*(p + 1)*(2*p + 3)), x] - Dist[(a*e*g - c*d*f*(2*p + 3))/(c*(2*p
+ 3)), Int[(a + c*x^2)^p, x], x] /; FreeQ[{a, c, d, e, f, g, p}, x] &&  !Le
Q[p, -1]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
```

```
}, x] && NeQ[a^2 + b^2, 0] && !IntegerQ[m/2]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] && !IntegerQ[m]
```

Rubi steps

$$\int (d\cos(e+fx))^m(a+b\tan(e+fx))^3\,dx = \left((d\cos(e+fx))^m(d\sec(e+fx))^m\right)\int (d\sec(e+fx))^{-m}(a+b\tan$$

$$= \frac{\left((d\cos(e+fx))^m\sec^2(e+fx)^{m/2}\right)\text{Subst}\left(\int (a+x)^3\left(1+\frac{x^2}{b^2}\right)^{-1-\frac{m}{2}}\right.}{bf}$$

$$= \frac{b(d\cos(e+fx))^m(a+b\tan(e+fx))^2}{f(2-m)} + \frac{\left(b(d\cos(e+fx))^m\sec^2(\right.}{}$$

$$= \frac{b(d\cos(e+fx))^m(a+b\tan(e+fx))^2}{f(2-m)} + \frac{b(d\cos(e+fx))^m\left(2\left(b^2\right.\right.}{}$$

$$= -\frac{a\left(3b^2-a^2(1-m)\right)(d\cos(e+fx))^m\,{}_2F_1\left(\frac{1}{2},\frac{2+m}{2};\frac{3}{2};-\tan^2(e+f\right.}{f(1-m)}$$

Mathematica [A] time = 3.16, size = 212, normalized size = 1.16

$$\frac{\cos(e+fx)(a+b\tan(e+fx))^3(d\cos(e+fx))^m\left(-\frac{a\left(a^2-3b^2\right)\sin(e+fx)\cos^3(e+fx)\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{m+3}{2};\cos^2(e+fx)\right)}{(m+1)\sqrt{\sin^2(e+fx)}}+\frac{b\left(b^2-3a^2\right)c}{n}\right.}{f(a\cos(e+fx)+b\sin(e+fx))^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d*Cos[e + f*x])^m*(a + b*Tan[e + f*x])^3,x]
```

```
[Out] (Cos[e + f*x]*(d*Cos[e + f*x])^m*(-(b^3/(-2 + m)) + (b*(-3*a^2 + b^2)*Cos[e
 + f*x]^2)/m - (a*(a^2 - 3*b^2)*Cos[e + f*x]^3*Hypergeometric2F1[1/2, (1 +
m)/2, (3 + m)/2, Cos[e + f*x]^2]*Sin[e + f*x])/((1 + m)*Sqrt[Sin[e + f*x]^2
]) - (3*a*b^2*Hypergeometric2F1[1/2, (-1 + m)/2, (1 + m)/2, Cos[e + f*x]^2]
*Sin[2*(e + f*x)])/(2*(-1 + m)*Sqrt[Sin[e + f*x]^2]))*(a + b*Tan[e + f*x])^
3)/(f*(a*Cos[e + f*x] + b*Sin[e + f*x])^3)
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(b^3\tan\left(fx+e\right)^3+3\,ab^2\tan\left(fx+e\right)^2+3\,a^2b\tan\left(fx+e\right)+a^3\right)\left(d\cos\left(fx+e\right)\right)^m,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))^m*(a+b*tan(f*x+e))^3,x, algorithm="fricas")
```

```
[Out] integral((b^3*tan(f*x + e)^3 + 3*a*b^2*tan(f*x + e)^2 + 3*a^2*b*tan(f*x + e
) + a^3)*(d*cos(f*x + e))^m, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(b\tan\left(fx+e\right)+a\right)^{3}\left(d\cos\left(fx+e\right)\right)^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))^m*(a+b*tan(f*x+e))^3,x, algorithm="giac")
[Out] integrate((b*tan(f*x + e) + a)^3*(d*cos(f*x + e))^m, x)
```

maple [F] time = 1.70, size = 0, normalized size = 0.00

$$\int \left(d\cos\left(fx+e\right)\right)^{m}\left(a+b\tan\left(fx+e\right)\right)^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*cos(f*x+e))^m*(a+b*tan(f*x+e))^3,x)
[Out] int((d*cos(f*x+e))^m*(a+b*tan(f*x+e))^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(b\tan\left(fx+e\right)+a\right)^{3}\left(d\cos\left(fx+e\right)\right)^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))^m*(a+b*tan(f*x+e))^3,x, algorithm="maxima")
[Out] integrate((b*tan(f*x + e) + a)^3*(d*cos(f*x + e))^m, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(d\,\cos\left(e+f\,x\right)\right)}^m\,{\left(a+b\,\tan\left(e+f\,x\right)\right)}^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*cos(e + f*x))^m*(a + b*tan(e + f*x))^3,x)
[Out] int((d*cos(e + f*x))^m*(a + b*tan(e + f*x))^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\cos\left(e+fx\right)\right)^{m}\left(a+b\tan\left(e+fx\right)\right)^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))**m*(a+b*tan(f*x+e))**3,x)
[Out] Integral((d*cos(e + f*x))**m*(a + b*tan(e + f*x))**3, x)
```

3.696 $\int (d\cos(e+fx))^m (a+b\tan(e+fx))^2\,dx$

Optimal. Leaf size=155

$$\frac{\left(b^2-a^2(1-m)\right)\sin(e+fx)\cos(e+fx)(d\cos(e+fx))^m\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{m+3}{2};\cos^2(e+fx)\right)}{f(1-m)(m+1)\sqrt{\sin^2(e+fx)}}-\frac{ab(2-m)(d\cos(e+}{f(1-m)m}$$

```
[Out] -a*b*(2-m)*(d*cos(f*x+e))^m/f/(1-m)/m+(b^2-a^2*(1-m))*cos(f*x+e)*(d*cos(f*x
+e))^m*hypergeom([1/2, 1/2+1/2*m],[3/2+1/2*m],cos(f*x+e)^2)*sin(f*x+e)/f/(-
m^2+1)/(sin(f*x+e)^2)^(1/2)+b*(d*cos(f*x+e))^m*(a+b*tan(f*x+e))/f/(1-m)
```

Rubi [A] time = 0.24, antiderivative size = 155, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {3515, 3508, 3486, 3772, 2643}

$$\frac{\left(b^2-a^2(1-m)\right)\sin(e+fx)\cos(e+fx)(d\cos(e+fx))^m\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{m+3}{2};\cos^2(e+fx)\right)}{f(1-m)(m+1)\sqrt{\sin^2(e+fx)}}-\frac{ab(2-m)(d\cos(e+}{f(1-m)m}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Cos[e + f*x])^m*(a + b*Tan[e + f*x])^2,x]
```

```
[Out] -((a*b*(2 - m)*(d*Cos[e + f*x])^m)/(f*(1 - m)*m)) + ((b^2 - a^2*(1 - m))*Co
s[e + f*x]*(d*Cos[e + f*x])^m*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/2,
Cos[e + f*x]^2]*Sin[e + f*x])/(f*(1 - m)*(1 + m)*Sqrt[Sin[e + f*x]^2]) + (b
*(d*Cos[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(1 - m))
```

Rule 2643

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Sin[c + d*x])^(n + 1)*Hypergeometric2F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c
+ d*x]^2])/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]), x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3508

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^2, x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m*(a + b*Tan[e + f*x]))/(f*(
m + 1)), x] + Dist[1/(m + 1), Int[(d*Sec[e + f*x])^m*(a^2*(m + 1) - b^2 + a
*b*(m + 2)*Tan[e + f*x]), x], x] /; FreeQ[{a, b, d, e, f, m}, x] && NeQ[a^2
 + b^2, 0] && NeQ[m, -1]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] && !IntegerQ[m]
```

Rule 3772

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(b*Csc[c + d*x]
)^(n - 1)*((Sin[c + d*x]/b)^(n - 1)*Int[1/(Sin[c + d*x]/b)^n, x]), x] /; Fr
eeQ[{b, c, d, n}, x] && !IntegerQ[n]
```

Rubi steps

$$\int (d\cos(e+fx))^m(a+b\tan(e+fx))^2\,dx = \left((d\cos(e+fx))^m(d\sec(e+fx))^m\right)\int (d\sec(e+fx))^{-m}(a+b\tan(e+$$

$$= \frac{b(d\cos(e+fx))^m(a+b\tan(e+fx))}{f(1-m)} + \frac{\left((d\cos(e+fx))^m(d\sec(e+\right.}{}$$

$$= -\frac{ab(2-m)(d\cos(e+fx))^m}{f(1-m)m} + \frac{b(d\cos(e+fx))^m(a+b\tan(e+fx))}{f(1-m)}$$

$$= -\frac{ab(2-m)(d\cos(e+fx))^m}{f(1-m)m} + \frac{b(d\cos(e+fx))^m(a+b\tan(e+fx))}{f(1-m)}$$

$$= -\frac{ab(2-m)(d\cos(e+fx))^m}{f(1-m)m} + \frac{\left(b^2-a^2(1-m)\right)\cos(e+fx)(d\cos(e}{f(1-m}$$

Mathematica [C] time = 3.75, size = 330, normalized size = 2.13

$$\frac{\cos(e+fx)(a+b\tan(e+fx))^2(d\cos(e+fx))^m\left(\sqrt{\sin^2(e+fx)}\left(-\frac{a^2\cos(e+fx)\cot(e+fx)\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{m+3}{2};\cos^2(e+fx)\right)}{m+1}-\frac{b^2}{}\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Cos[e + f*x])^m*(a + b*Tan[e + f*x])^2,x]
```

```
[Out] (Cos[e + f*x]*(d*Cos[e + f*x])^m*(-((2^(1 - m)*a*b*((1 + E^((2*I)*(e + f*x)
))/E^(I*(e + f*x)))^m*Cos[e + f*x]^(1 - m)*Hypergeometric2F1[1, m/2, 1 - m/
2, -E^((2*I)*(e + f*x))])/m) + (2^(1 - m)*a*b*E^((2*I)*(e + f*x))*((1 + E^(
(2*I)*(e + f*x)))/E^(I*(e + f*x)))^m*Cos[e + f*x]^(1 - m)*Hypergeometric2F1
[1, (2 + m)/2, 2 - m/2, -E^((2*I)*(e + f*x))])/(-2 + m) + (-((b^2*Csc[e + f
*x]*Hypergeometric2F1[-1/2, (-1 + m)/2, (1 + m)/2, Cos[e + f*x]^2])/(-1 + m
)) - (a^2*Cos[e + f*x]*Cot[e + f*x]*Hypergeometric2F1[1/2, (1 + m)/2, (3 +
m)/2, Cos[e + f*x]^2])/(1 + m))*Sqrt[Sin[e + f*x]^2])*(a + b*Tan[e + f*x])^
2)/(f*(a*Cos[e + f*x] + b*Sin[e + f*x])^2)
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(b^2\tan\left(fx+e\right)^2+2\,ab\tan\left(fx+e\right)+a^2\right)\left(d\cos\left(fx+e\right)\right)^m,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))^m*(a+b*tan(f*x+e))^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*tan(f*x + e)^2 + 2*a*b*tan(f*x + e) + a^2)*(d*cos(f*x + e))^m
, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(b\tan\left(fx+e\right)+a\right)^2\left(d\cos\left(fx+e\right)\right)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))^m*(a+b*tan(f*x+e))^2,x, algorithm="giac")
[Out] integrate((b*tan(f*x + e) + a)^2*(d*cos(f*x + e))^m, x)
```

maple [F] time = 1.26, size = 0, normalized size = 0.00

$$\int \left(d \cos \left(f x+e\right)\right)^{m} \left(a +b \tan \left(f x+e\right)\right)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*cos(f*x+e))^m*(a+b*tan(f*x+e))^2,x)
[Out] int((d*cos(f*x+e))^m*(a+b*tan(f*x+e))^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int {\left(b \tan \left(f x + e\right) + a\right)}^{2} \left(d \cos \left(f x + e\right)\right)^{m}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))^m*(a+b*tan(f*x+e))^2,x, algorithm="maxima")
[Out] integrate((b*tan(f*x + e) + a)^2*(d*cos(f*x + e))^m, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(d\,\cos\left(e+f\,x\right)\right)}^m\,{\left(a+b\,\mathrm{tan}\left(e+f\,x\right)\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*cos(e + f*x))^m*(a + b*tan(e + f*x))^2,x)
[Out] int((d*cos(e + f*x))^m*(a + b*tan(e + f*x))^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d \cos{\left (e + f x \right)}\right)^{m} \left(a + b \tan{\left (e + f x \right)}\right)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))**m*(a+b*tan(f*x+e))**2,x)
[Out] Integral((d*cos(e + f*x))**m*(a + b*tan(e + f*x))**2, x)
```

3.697 $\int (d\cos(e+fx))^m(a+b\tan(e+fx))\,dx$

Optimal. Leaf size=90

$$-\frac{a\sin(e+fx)(d\cos(e+fx))^{m+1}\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{m+3}{2};\cos^2(e+fx)\right)}{df(m+1)\sqrt{\sin^2(e+fx)}}-\frac{b(d\cos(e+fx))^m}{fm}$$

```
[Out] -b*(d*cos(f*x+e))^m/f/m-a*(d*cos(f*x+e))^(1+m)*hypergeom([1/2, 1/2+1/2*m],[
3/2+1/2*m],cos(f*x+e)^2)*sin(f*x+e)/d/f/(1+m)/(sin(f*x+e)^2)^(1/2)
```

Rubi [A] time = 0.10, antiderivative size = 91, normalized size of antiderivative = 1.01, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {3515, 3486, 3772, 2643}

$$-\frac{a\sin(e+fx)\cos(e+fx)(d\cos(e+fx))^m\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{m+3}{2};\cos^2(e+fx)\right)}{f(m+1)\sqrt{\sin^2(e+fx)}}-\frac{b(d\cos(e+fx))^m}{fm}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Cos[e + f*x])^m*(a + b*Tan[e + f*x]),x]
```

```
[Out] -((b*(d*Cos[e + f*x])^m)/(f*m)) - (a*Cos[e + f*x]*(d*Cos[e + f*x])^m*Hyperg
eometric2F1[1/2, (1 + m)/2, (3 + m)/2, Cos[e + f*x]^2]*Sin[e + f*x])/(f*(1
+ m)*Sqrt[Sin[e + f*x]^2])
```

Rule 2643

```
Int[((b_.)*sin[(c_.) + (d_.)*(x_)])^(n_), x_Symbol] :> Simp[(Cos[c + d*x]*(
b*Sin[c + d*x])^(n + 1)*Hypergeometric2F1[1/2, (n + 1)/2, (n + 3)/2, Sin[c
+ d*x]^2])/(b*d*(n + 1)*Sqrt[Cos[c + d*x]^2]), x] /; FreeQ[{b, c, d, n}, x]
 && !IntegerQ[2*n]
```

Rule 3486

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)]), x_Symbol] :> Simp[(b*(d*Sec[e + f*x])^m)/(f*m), x] + Dist[a, Int[(d*
Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m}, x] && (IntegerQ[2*m] |
| NeQ[a^2 + b^2, 0])
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] && !IntegerQ[m]
```

Rule 3772

```
Int[(csc[(c_.) + (d_.)*(x_)]*(b_.))^(n_), x_Symbol] :> Simp[(b*Csc[c + d*x]
)^(n - 1)*((Sin[c + d*x]/b)^(n - 1)*Int[1/(Sin[c + d*x]/b)^n, x]), x] /; Fr
eeQ[{b, c, d, n}, x] && !IntegerQ[n]
```

Rubi steps

$$\int (d\cos(e+fx))^m(a+b\tan(e+fx))\,dx = \left((d\cos(e+fx))^m(d\sec(e+fx))^m\right)\int (d\sec(e+fx))^{-m}(a+b\tan(
$$
$$= -\frac{b(d\cos(e+fx))^m}{fm} + \left(a(d\cos(e+fx))^m(d\sec(e+fx))^m\right)\int (d\,se
$$
$$= -\frac{b(d\cos(e+fx))^m}{fm} + \left(a\left(\frac{\cos(e+fx)}{d}\right)^{-m}(d\cos(e+fx))^m\right)\int \Big(
$$
$$= -\frac{b(d\cos(e+fx))^m}{fm} - \frac{a\cos(e+fx)(d\cos(e+fx))^m\,{}_2F_1\left(\frac{1}{2},\frac{1+m}{2};\frac{3}{}\right.}{f(1+m)\sqrt{\sin^2(e+}}
$$

Mathematica [C] time = 1.05, size = 203, normalized size = 2.26

$$\frac{(d\cos(e+fx))^m\left(-a(m-2)m\sin(2(e+fx))\,{}_2F_1\left(\frac{1}{2},\frac{m+1}{2};\frac{m+3}{2};\cos^2(e+fx)\right)-2b\left(m^2-m-2\right)\sqrt{\sin^2(e+fx)}\right.}{2f(m-2)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Cos[e + f*x])^m*(a + b*Tan[e + f*x]),x]
```

```
[Out] ((d*Cos[e + f*x])^m*(-2*b*(-2 - m + m^2)*Hypergeometric2F1[1, m/2, 1 - m/2,
 -E^((2*I)*(e + f*x))]*Sqrt[Sin[e + f*x]^2] + 2*b*m*(1 + m)*Hypergeometric2
F1[1, (2 + m)/2, 2 - m/2, -E^((2*I)*(e + f*x))]*Sqrt[Sin[e + f*x]^2]*(Cos[2
*(e + f*x)] + I*Sin[2*(e + f*x)]) - a*(-2 + m)*m*Hypergeometric2F1[1/2, (1
+ m)/2, (3 + m)/2, Cos[e + f*x]^2]*Sin[2*(e + f*x)]))/(2*f*(-2 + m)*m*(1 +
m)*Sqrt[Sin[e + f*x]^2])
```

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(b\tan\left(fx+e\right)+a\right)\left(d\cos\left(fx+e\right)\right)^{m},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))^m*(a+b*tan(f*x+e)),x, algorithm="fricas")
```

```
[Out] integral((b*tan(f*x + e) + a)*(d*cos(f*x + e))^m, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(b\tan\left(fx+e\right)+a\right)\left(d\cos\left(fx+e\right)\right)^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))^m*(a+b*tan(f*x+e)),x, algorithm="giac")
```

```
[Out] integrate((b*tan(f*x + e) + a)*(d*cos(f*x + e))^m, x)
```

maple [F] time = 1.69, size = 0, normalized size = 0.00

$$\int \left(d\cos\left(fx+e\right)\right)^{m}\left(a+b\tan\left(fx+e\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*cos(f*x+e))^m*(a+b*tan(f*x+e)),x)
```

```
[Out] int((d*cos(f*x+e))^m*(a+b*tan(f*x+e)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(b\tan\left(fx+e\right)+a\right)\left(d\cos\left(fx+e\right)\right)^{m}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))^m*(a+b*tan(f*x+e)),x, algorithm="maxima")
[Out] integrate((b*tan(f*x + e) + a)*(d*cos(f*x + e))^m, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(d\,\cos\left(e+f\,x\right)\right)}^m\,\left(a+b\,\tan\left(e+f\,x\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*cos(e + f*x))^m*(a + b*tan(e + f*x)),x)
[Out] int((d*cos(e + f*x))^m*(a + b*tan(e + f*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\cos\left(e+fx\right)\right)^{m}\left(a+b\tan\left(e+fx\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))**m*(a+b*tan(f*x+e)),x)
[Out] Integral((d*cos(e + f*x))**m*(a + b*tan(e + f*x)), x)
```

3.698 $\int \frac{(d\cos(e+fx))^m}{a+b\tan(e+fx)}\,dx$

Optimal. Leaf size=140

$$\frac{\tan(e+fx)\sec^2(e+fx)^{m/2}(d\cos(e+fx))^m F_1\left(\frac{1}{2};1,\frac{m+2}{2};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{af}+\frac{b(d\cos(e+fx))^m\,{}_2F}{fm}$$

```
[Out] b*(d*cos(f*x+e))^m*hypergeom([1, -1/2*m],[1-1/2*m],b^2*sec(f*x+e)^2/(a^2+b^
2))/(a^2+b^2)/f/m+AppellF1(1/2,1,1+1/2*m,3/2,b^2*tan(f*x+e)^2/a^2,-tan(f*x+
e)^2)*(d*cos(f*x+e))^m*(sec(f*x+e)^2)^(1/2*m)*tan(f*x+e)/a/f
```

Rubi [A] time = 0.21, antiderivative size = 140, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {3515, 3512, 757, 429, 444, 68}

$$\frac{\tan(e+fx)\sec^2(e+fx)^{m/2}(d\cos(e+fx))^m F_1\left(\frac{1}{2};1,\frac{m+2}{2};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{af}+\frac{b(d\cos(e+fx))^m\,{}_2F}{fm}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Cos[e + f*x])^m/(a + b*Tan[e + f*x]),x]
```

```
[Out] (b*(d*Cos[e + f*x])^m*Hypergeometric2F1[1, -m/2, 1 - m/2, (b^2*Sec[e + f*x]
^2)/(a^2 + b^2)])/((a^2 + b^2)*f*m) + (AppellF1[1/2, 1, (2 + m)/2, 3/2, (b^
2*Tan[e + f*x]^2)/a^2, -Tan[e + f*x]^2]*(d*Cos[e + f*x])^m*(Sec[e + f*x]^2)
^(m/2)*Tan[e + f*x])/(a*f)
```

Rule 68

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a
+ b*x))/(b*c - a*d))])/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]
 && NeQ[b*c - a*d, 0] &&  !IntegerQ[m] && IntegerQ[n]
```

Rule 429

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[a^p*c^q*x*AppellF1[1/n, -p, -q, 1 + 1/n, -((b*x^n)/a), -((d*x^n)/c)
], x] /; FreeQ[{a, b, c, d, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[n, -1]
 && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 757

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Int[E
xpandIntegrand[(a + c*x^2)^p, (d/(d^2 - e^2*x^2) - (e*x)/(d^2 - e^2*x^2))^(
-m), x], x] /; FreeQ[{a, c, d, e, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !Inte
gerQ[p] && ILtQ[m, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rubi steps

$$\int \frac{(d\cos(e+fx))^m}{a+b\tan(e+fx)}\,dx = \left((d\cos(e+fx))^m(d\sec(e+fx))^m\right)\int \frac{(d\sec(e+fx))^{-m}}{a+b\tan(e+fx)}\,dx$$

$$= \frac{\left((d\cos(e+fx))^m\sec^2(e+fx)^{m/2}\right)\text{Subst}\left(\int \frac{\left(1+\frac{x^2}{b^2}\right)^{-1-\frac{m}{2}}}{a+x}\,dx, x, b\tan(e+fx)\right)}{bf}$$

$$= \frac{\left((d\cos(e+fx))^m\sec^2(e+fx)^{m/2}\right)\text{Subst}\left(\int \left(\frac{a\left(1+\frac{x^2}{b^2}\right)^{-1-\frac{m}{2}}}{a^2-x^2}+\frac{x\left(1+\frac{x^2}{b^2}\right)^{-1-\frac{m}{2}}}{-a^2+x^2}\right)dx, x, b\tan(e\right.}{bf}$$

$$= \frac{\left((d\cos(e+fx))^m\sec^2(e+fx)^{m/2}\right)\text{Subst}\left(\int \frac{x\left(1+\frac{x^2}{b^2}\right)^{-1-\frac{m}{2}}}{-a^2+x^2}\,dx, x, b\tan(e+fx)\right)}{bf} + \frac{\left(a(d\,\mathrm{co}\right.}{}$$

$$= \frac{F_1\left(\frac{1}{2};1,\frac{2+m}{2};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)(d\cos(e+fx))^m\sec^2(e+fx)^{m/2}\tan(e+f}{af}$$

$$= \frac{b(d\cos(e+fx))^m\,{}_2F_1\left(1,-\frac{m}{2};1-\frac{m}{2};\frac{b^2\sec^2(e+fx)}{a^2+b^2}\right)}{\left(a^2+b^2\right)fm} + \frac{F_1\left(\frac{1}{2};1,\frac{2+m}{2};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2\right.}{}$$

Mathematica [C] time = 14.25, size = 1132, normalized size = 8.09

$$\frac{}{f(a+b\tan(e+fx))\left(-\frac{1}{2}bmF_1\left(m;\frac{m}{2},\frac{m}{2};m+1;\frac{a-ib}{a+b\tan(e+fx)},\frac{a+ib}{a+b\tan(e+fx)}\right)\sec^2(e+fx)^{-m/2}\left(\frac{b(\tan(e+fx)+i)}{a+b\tan(e+fx)}\right)^{m/2}\left(\frac{b\sec}{a+b\,\mathrm{ta}}\right.\right.}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Cos[e + f*x])^m/(a + b*Tan[e + f*x]),x]
```

```
[Out] ((d*Cos[e + f*x])^m*(b*(-1 + (Sec[e + f*x]^2)^(-1/2*m)) + a*m*Hypergeometri
c2F1[1/2, 1 + m/2, 3/2, -Tan[e + f*x]^2]*Tan[e + f*x] - (b*AppellF1[m, m/2,
```

```
 m/2, 1 + m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])
]*((b*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*((b*(I + Tan[e + f*x
]))/(a + b*Tan[e + f*x]))^(m/2))/(Sec[e + f*x]^2)^(m/2)))/(f*(a + b*Tan[e +
 f*x])*(a*m*Hypergeometric2F1[1/2, 1 + m/2, 3/2, -Tan[e + f*x]^2]*Sec[e + f
*x]^2 - (b*m*Tan[e + f*x])/(Sec[e + f*x]^2)^(m/2) + (b*m*AppellF1[m, m/2, m
/2, 1 + m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])]*
Tan[e + f*x]*((b*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*((b*(I +
Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2))/(Sec[e + f*x]^2)^(m/2) - (b*((b
*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*((b*(I + Tan[e + f*x]))/(
a + b*Tan[e + f*x]))^(m/2)*(-1/2*((a - I*b)*b*m^2*AppellF1[1 + m, 1 + m/2,
m/2, 2 + m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])]
*Sec[e + f*x]^2)/((1 + m)*(a + b*Tan[e + f*x])^2) - ((a + I*b)*b*m^2*Appell
F1[1 + m, m/2, 1 + m/2, 2 + m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a
 + b*Tan[e + f*x])]*Sec[e + f*x]^2)/(2*(1 + m)*(a + b*Tan[e + f*x])^2)))/(S
ec[e + f*x]^2)^(m/2) - (b*m*AppellF1[m, m/2, m/2, 1 + m, (a - I*b)/(a + b*T
an[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])]*((b*(-I + Tan[e + f*x]))/(a +
 b*Tan[e + f*x]))^(-1 + m/2)*((b*(I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^
(m/2)*(-((b^2*Sec[e + f*x]^2*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x])^2) +
 (b*Sec[e + f*x]^2)/(a + b*Tan[e + f*x])))/(2*(Sec[e + f*x]^2)^(m/2)) - (b*
m*AppellF1[m, m/2, m/2, 1 + m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a
 + b*Tan[e + f*x])]*((b*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*((
b*(I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(-1 + m/2)*(-((b^2*Sec[e + f*x]
^2*(I + Tan[e + f*x]))/(a + b*Tan[e + f*x])^2) + (b*Sec[e + f*x]^2)/(a + b*
Tan[e + f*x])))/(2*(Sec[e + f*x]^2)^(m/2)) + a*m*Sec[e + f*x]^2*(-Hypergeom
etric2F1[1/2, 1 + m/2, 3/2, -Tan[e + f*x]^2] + (1 + Tan[e + f*x]^2)^(-1 - m
/2))))
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(d\cos\left(fx+e\right)\right)^{m}}{b\tan\left(fx+e\right)+a},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))^m/(a+b*tan(f*x+e)),x, algorithm="fricas")
[Out] integral((d*cos(f*x + e))^m/(b*tan(f*x + e) + a), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\cos\left(fx+e\right)\right)^{m}}{b\tan\left(fx+e\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))^m/(a+b*tan(f*x+e)),x, algorithm="giac")
[Out] integrate((d*cos(f*x + e))^m/(b*tan(f*x + e) + a), x)
```

maple [F] time = 1.22, size = 0, normalized size = 0.00

$$\int \frac{\left(d\cos\left(fx+e\right)\right)^{m}}{a+b\tan\left(fx+e\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*cos(f*x+e))^m/(a+b*tan(f*x+e)),x)
[Out] int((d*cos(f*x+e))^m/(a+b*tan(f*x+e)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\cos\left(fx+e\right)\right)^m}{b\tan\left(fx+e\right)+a}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))^m/(a+b*tan(f*x+e)),x, algorithm="maxima")
[Out] integrate((d*cos(f*x + e))^m/(b*tan(f*x + e) + a), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(d\,\cos\left(e+f\,x\right)\right)^m}{a+b\tan\left(e+f\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*cos(e + f*x))^m/(a + b*tan(e + f*x)),x)
[Out] int((d*cos(e + f*x))^m/(a + b*tan(e + f*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\cos\left(e+fx\right)\right)^m}{a+b\tan\left(e+fx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))**m/(a+b*tan(f*x+e)),x)
[Out] Integral((d*cos(e + f*x))**m/(a + b*tan(e + f*x)), x)
```

3.699 $\int \frac{(d\cos(e+fx))^m}{(a+b\tan(e+fx))^2}\,dx$

Optimal. Leaf size=227

$$\frac{\tan(e+fx)\sec^2(e+fx)^{m/2}(d\cos(e+fx))^m F_1\left(\frac{1}{2};2,\frac{m+2}{2};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{a^2 f}+\frac{2ab(d\cos(e+fx))^m}{f}$$

```
[Out] 2*a*b*(d*cos(f*x+e))^m*hypergeom([2, -1/2*m],[1-1/2*m],b^2*sec(f*x+e)^2/(a^
2+b^2))/(a^2+b^2)^2/f/m+AppellF1(1/2,2,1+1/2*m,3/2,b^2*tan(f*x+e)^2/a^2,-ta
n(f*x+e)^2)*(d*cos(f*x+e))^m*(sec(f*x+e)^2)^(1/2*m)*tan(f*x+e)/a^2/f+1/3*b^
2*AppellF1(3/2,2,2,1+1/2*m,5/2,b^2*tan(f*x+e)^2/a^2,-tan(f*x+e)^2)*(d*cos(f*x
+e))^m*(sec(f*x+e)^2)^(1/2*m)*tan(f*x+e)^3/a^4/f
```

Rubi [A] time = 0.28, antiderivative size = 227, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {3515, 3512, 757, 429, 444, 68, 510}

$$\frac{b^2\tan^3(e+fx)\sec^2(e+fx)^{m/2}(d\cos(e+fx))^m F_1\left(\frac{3}{2};2,\frac{m+2}{2};\frac{5}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)}{3a^4 f}+\frac{\tan(e+fx)\sec^2}{}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Cos[e + f*x])^m/(a + b*Tan[e + f*x])^2,x]
```

```
[Out] (2*a*b*(d*Cos[e + f*x])^m*Hypergeometric2F1[2, -m/2, 1 - m/2, (b^2*Sec[e +
f*x]^2)/(a^2 + b^2)])/((a^2 + b^2)^2*f*m) + (AppellF1[1/2, 2, (2 + m)/2, 3/
2, (b^2*Tan[e + f*x]^2)/a^2, -Tan[e + f*x]^2]*(d*Cos[e + f*x])^m*(Sec[e + f
*x]^2)^(m/2)*Tan[e + f*x])/(a^2*f) + (b^2*AppellF1[3/2, 2, (2 + m)/2, 5/2,
(b^2*Tan[e + f*x]^2)/a^2, -Tan[e + f*x]^2]*(d*Cos[e + f*x])^m*(Sec[e + f*x]
^2)^(m/2)*Tan[e + f*x]^3)/(3*a^4*f)
```

Rule 68

```
Int[((a_) + (b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[((
b*c - a*d)^n*(a + b*x)^(m + 1)*Hypergeometric2F1[-n, m + 1, m + 2, -((d*(a
+ b*x))/(b*c - a*d))])/(b^(n + 1)*(m + 1)), x] /; FreeQ[{a, b, c, d, m}, x]
 && NeQ[b*c - a*d, 0] &&  !IntegerQ[m] && IntegerQ[n]
```

Rule 429

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[a^p*c^q*x*AppellF1[1/n, -p, -q, 1 + 1/n, -((b*x^n)/a), -((d*x^n)/c)
], x] /; FreeQ[{a, b, c, d, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[n, -1]
 && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 510

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> Simp[(a^p*c^q*(e*x)^(m + 1)*AppellF1[(m + 1)/n, -p, -
q, 1 + (m + 1)/n, -((b*x^n)/a), -((d*x^n)/c)])/(e*(m + 1)), x] /; FreeQ[{a,
```

```
b, c, d, e, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] && NeQ[m, n
 - 1] && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 757

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> Int[E
xpandIntegrand[(a + c*x^2)^p, (d/(d^2 - e^2*x^2) - (e*x)/(d^2 - e^2*x^2))^(
-m), x], x] /; FreeQ[{a, c, d, e, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !Inte
gerQ[p] && ILtQ[m, 0]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
 n}, x] &&  !IntegerQ[m]
```

Rubi steps

$$\int \frac{(d\cos(e+fx))^m}{(a+b\tan(e+fx))^2}\,dx = \left((d\cos(e+fx))^m(d\sec(e+fx))^m\right)\int \frac{(d\sec(e+fx))^{-m}}{(a+b\tan(e+fx))^2}\,dx$$

$$= \frac{\left((d\cos(e+fx))^m \sec^2(e+fx)^{m/2}\right)\text{Subst}\left(\int \frac{\left(1+\frac{x^2}{b^2}\right)^{-1-\frac{m}{2}}}{(a+x)^2}\,dx, x, b\tan(e+fx)\right)}{bf}$$

$$= \frac{\left((d\cos(e+fx))^m \sec^2(e+fx)^{m/2}\right)\text{Subst}\left(\int \left(\frac{a^2\left(1+\frac{x^2}{b^2}\right)^{-1-\frac{m}{2}}}{\left(a^2-x^2\right)^2} - \frac{2ax\left(1+\frac{x^2}{b^2}\right)^{-1-\frac{m}{2}}}{\left(a^2-x^2\right)^2} + \frac{x^2\left(1+\frac{x^2}{b^2}\right.}{\left(-a^2+\right.}\right.\right.}{bf}$$

$$= \frac{\left((d\cos(e+fx))^m \sec^2(e+fx)^{m/2}\right)\text{Subst}\left(\int \frac{x^2\left(1+\frac{x^2}{b^2}\right)^{-1-\frac{m}{2}}}{\left(-a^2+x^2\right)^2}\,dx, x, b\tan(e+fx)\right)}{bf} - \frac{(2a}{}$$

$$= \frac{F_1\left(\frac{1}{2};2,\frac{2+m}{2};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\tan^2(e+fx)\right)(d\cos(e+fx))^m\sec^2(e+fx)^{m/2}\tan(e}{a^2f}$$

$$= \frac{2ab(d\cos(e+fx))^m\,{}_2F_1\left(2,-\frac{m}{2};1-\frac{m}{2};\frac{b^2\sec^2(e+fx)}{a^2+b^2}\right)}{\left(a^2+b^2\right)^2 fm} + \frac{F_1\left(\frac{1}{2};2,\frac{2+m}{2};\frac{3}{2};\frac{b^2\tan^2(e+fx)}{a^2},-\right.}{}$$

Mathematica [C] time = 17.74, size = 2502, normalized size = 11.02

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Cos[e + f*x])^m/(a + b*Tan[e + f*x])^2,x]
```

```
[Out] ((d*Cos[e + f*x])^m*((2*a*b*(-1 + (Sec[e + f*x]^2)^(-1/2*m)))/m + a^2*Hyper
geometric2F1[1/2, 1 + m/2, 3/2, -Tan[e + f*x]^2]*Tan[e + f*x] - b^2*Hyperge
ometric2F1[1/2, 1 + m/2, 3/2, -Tan[e + f*x]^2]*Tan[e + f*x] - (2*a*b*Appell
F1[m, m/2, m/2, 1 + m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan
[e + f*x])]*((b*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*((b*(I + T
an[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2))/(m*(Sec[e + f*x]^2)^(m/2)) - (b*
(a^2 + b^2)*AppellF1[1 + m, m/2, m/2, 2 + m, (a - I*b)/(a + b*Tan[e + f*x])
, (a + I*b)/(a + b*Tan[e + f*x])]*((b*(-I + Tan[e + f*x]))/(a + b*Tan[e + f
*x]))^(m/2)*((b*(I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2))/((1 + m)*(
Sec[e + f*x]^2)^(m/2)*(a + b*Tan[e + f*x]))))/(f*(a + b*Tan[e + f*x])^2*(a^
2*Hypergeometric2F1[1/2, 1 + m/2, 3/2, -Tan[e + f*x]^2]*Sec[e + f*x]^2 - b^
2*Hypergeometric2F1[1/2, 1 + m/2, 3/2, -Tan[e + f*x]^2]*Sec[e + f*x]^2 - (2
*a*b*Tan[e + f*x])/(Sec[e + f*x]^2)^(m/2) + (2*a*b*AppellF1[m, m/2, m/2, 1
+ m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])]*Tan[e
+ f*x]*((b*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*((b*(I + Tan[e
+ f*x]))/(a + b*Tan[e + f*x]))^(m/2))/(Sec[e + f*x]^2)^(m/2) + (b^2*(a^2 +
b^2)*AppellF1[1 + m, m/2, m/2, 2 + m, (a - I*b)/(a + b*Tan[e + f*x]), (a +
I*b)/(a + b*Tan[e + f*x])]*(Sec[e + f*x]^2)^(1 - m/2)*((b*(-I + Tan[e + f*x
]))/(a + b*Tan[e + f*x]))^(m/2)*((b*(I + Tan[e + f*x]))/(a + b*Tan[e + f*x]
))^(m/2))/((1 + m)*(a + b*Tan[e + f*x])^2) + (b*(a^2 + b^2)*m*AppellF1[1 +
m, m/2, m/2, 2 + m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e
+ f*x])]*Tan[e + f*x]*((b*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*
((b*(I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2))/((1 + m)*(Sec[e + f*x]
^2)^(m/2)*(a + b*Tan[e + f*x])) - (2*a*b*((b*(-I + Tan[e + f*x]))/(a + b*Ta
n[e + f*x]))^(m/2)*((b*(I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*(-1/
2*((a - I*b)*b*m^2*AppellF1[1 + m, 1 + m/2, m/2, 2 + m, (a - I*b)/(a + b*Ta
n[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])]*Sec[e + f*x]^2)/((1 + m)*(a +
b*Tan[e + f*x])^2) - ((a + I*b)*b*m^2*AppellF1[1 + m, m/2, 1 + m/2, 2 + m,
(a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])]*Sec[e + f*x
]^2)/(2*(1 + m)*(a + b*Tan[e + f*x])^2)))/(m*(Sec[e + f*x]^2)^(m/2)) - (b*(
a^2 + b^2)*((b*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*((b*(I + Ta
n[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*(-1/2*((a - I*b)*b*m*(1 + m)*Appel
lF1[2 + m, 1 + m/2, m/2, 3 + m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(
a + b*Tan[e + f*x])]*Sec[e + f*x]^2)/((2 + m)*(a + b*Tan[e + f*x])^2) - ((a
 + I*b)*b*m*(1 + m)*AppellF1[2 + m, m/2, 1 + m/2, 3 + m, (a - I*b)/(a + b*T
an[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])]*Sec[e + f*x]^2)/(2*(2 + m)*(a
 + b*Tan[e + f*x])^2)))/((1 + m)*(Sec[e + f*x]^2)^(m/2)*(a + b*Tan[e + f*x]
)) - (a*b*AppellF1[m, m/2, m/2, 1 + m, (a - I*b)/(a + b*Tan[e + f*x]), (a +
 I*b)/(a + b*Tan[e + f*x])]*((b*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^
(-1 + m/2)*((b*(I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*(-((b^2*Sec[
e + f*x]^2*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x])^2) + (b*Sec[e + f*x]^2
)/(a + b*Tan[e + f*x])))/(Sec[e + f*x]^2)^(m/2) - (b*(a^2 + b^2)*m*AppellF1
[1 + m, m/2, m/2, 2 + m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*T
an[e + f*x])]*((b*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(-1 + m/2)*((b
*(I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*(-((b^2*Sec[e + f*x]^2*(-I
 + Tan[e + f*x]))/(a + b*Tan[e + f*x])^2) + (b*Sec[e + f*x]^2)/(a + b*Tan[e
 + f*x])))/(2*(1 + m)*(Sec[e + f*x]^2)^(m/2)*(a + b*Tan[e + f*x])) - (a*b*A
ppellF1[m, m/2, m/2, 1 + m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a +
b*Tan[e + f*x])]*((b*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*((b*(
I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(-1 + m/2)*(-((b^2*Sec[e + f*x]^2*
(I + Tan[e + f*x]))/(a + b*Tan[e + f*x])^2) + (b*Sec[e + f*x]^2)/(a + b*Tan
[e + f*x])))/(Sec[e + f*x]^2)^(m/2) - (b*(a^2 + b^2)*m*AppellF1[1 + m, m/2,
 m/2, 2 + m, (a - I*b)/(a + b*Tan[e + f*x]), (a + I*b)/(a + b*Tan[e + f*x])
]*((b*(-I + Tan[e + f*x]))/(a + b*Tan[e + f*x]))^(m/2)*((b*(I + Tan[e + f*x
]))/(a + b*Tan[e + f*x]))^(-1 + m/2)*(-((b^2*Sec[e + f*x]^2*(I + Tan[e + f*
x]))/(a + b*Tan[e + f*x])^2) + (b*Sec[e + f*x]^2)/(a + b*Tan[e + f*x])))/(2
```

```
*(1 + m)*(Sec[e + f*x]^2)^(m/2)*(a + b*Tan[e + f*x])) + a^2*Sec[e + f*x]^2*
(-Hypergeometric2F1[1/2, 1 + m/2, 3/2, -Tan[e + f*x]^2] + (1 + Tan[e + f*x]
^2)^(-1 - m/2)) - b^2*Sec[e + f*x]^2*(-Hypergeometric2F1[1/2, 1 + m/2, 3/2,
 -Tan[e + f*x]^2] + (1 + Tan[e + f*x]^2)^(-1 - m/2))))
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(d\cos\left(fx+e\right)\right)^{m}}{b^{2}\tan\left(fx+e\right)^{2}+2\,ab\tan\left(fx+e\right)+a^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))^m/(a+b*tan(f*x+e))^2,x, algorithm="fricas")
```

```
[Out] integral((d*cos(f*x + e))^m/(b^2*tan(f*x + e)^2 + 2*a*b*tan(f*x + e) + a^2)
, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(d\cos\left(fx+e\right)\right)^{m}}{\left(b\tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))^m/(a+b*tan(f*x+e))^2,x, algorithm="giac")
```

```
[Out] integrate((d*cos(f*x + e))^m/(b*tan(f*x + e) + a)^2, x)
```

maple [F] time = 1.69, size = 0, normalized size = 0.00

$$\int\frac{\left(d\cos\left(fx+e\right)\right)^{m}}{\left(a+b\tan\left(fx+e\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*cos(f*x+e))^m/(a+b*tan(f*x+e))^2,x)
```

```
[Out] int((d*cos(f*x+e))^m/(a+b*tan(f*x+e))^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(d\cos\left(fx+e\right)\right)^{m}}{\left(b\tan\left(fx+e\right)+a\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))^m/(a+b*tan(f*x+e))^2,x, algorithm="maxima")
```

```
[Out] integrate((d*cos(f*x + e))^m/(b*tan(f*x + e) + a)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{{\left(d\,\cos\left(e+f\,x\right)\right)}^m}{{\left(a+b\,\mathrm{tan}\left(e+f\,x\right)\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*cos(e + f*x))^m/(a + b*tan(e + f*x))^2,x)
```

```
[Out] int((d*cos(e + f*x))^m/(a + b*tan(e + f*x))^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(d\cos\left(e+fx\right)\right)^{m}}{\left(a+b\tan\left(e+fx\right)\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))**m/(a+b*tan(f*x+e))**2,x)
[Out] Integral((d*cos(e + f*x))**m/(a + b*tan(e + f*x))**2, x)
```

3.700 $\int (d\cos(e+fx))^m(a+b\tan(e+fx))^n\,dx$

Optimal. Leaf size=187

$$\frac{\cos^2(e+fx)(d\cos(e+fx))^m\left(1-\frac{a+b\tan(e+fx)}{a-\sqrt{-b^2}}\right)^{\frac{m+2}{2}}\left(1-\frac{a+b\tan(e+fx)}{a+\sqrt{-b^2}}\right)^{\frac{m+2}{2}}(a+b\tan(e+fx))^{n+1}F_1\left(n+1;\frac{m+2}{2},\frac{m+2}{2}\right.}{bf(n+1)}$$

```
[Out] AppellF1(1+n,1+1/2*m,1+1/2*m,2+n,(a+b*tan(f*x+e))/(a-(-b^2)^(1/2)),(a+b*tan
(f*x+e))/(a+(-b^2)^(1/2)))*cos(f*x+e)^2*(d*cos(f*x+e))^m*(a+b*tan(f*x+e))^(
1+n)*(1+(-a-b*tan(f*x+e))/(a-(-b^2)^(1/2)))^(1+1/2*m)*(1+(-a-b*tan(f*x+e))/
(a+(-b^2)^(1/2)))^(1+1/2*m)/b/f/(1+n)
```

Rubi [A] time = 0.20, antiderivative size = 187, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.174$, Rules used = {3515, 3512, 760, 133}

$$\frac{\cos^2(e+fx)(d\cos(e+fx))^m\left(1-\frac{a+b\tan(e+fx)}{a-\sqrt{-b^2}}\right)^{\frac{m+2}{2}}\left(1-\frac{a+b\tan(e+fx)}{a+\sqrt{-b^2}}\right)^{\frac{m+2}{2}}(a+b\tan(e+fx))^{n+1}F_1\left(n+1;\frac{m+2}{2},\frac{m+2}{2}\right.}{bf(n+1)}$$

Antiderivative was successfully verified.

```
[In] Int[(d*Cos[e + f*x])^m*(a + b*Tan[e + f*x])^n,x]
```

```
[Out] (AppellF1[1 + n, (2 + m)/2, (2 + m)/2, 2 + n, (a + b*Tan[e + f*x])/(a - Sqr
t[-b^2]), (a + b*Tan[e + f*x])/(a + Sqrt[-b^2])]*Cos[e + f*x]^2*(d*Cos[e +
f*x])^m*(a + b*Tan[e + f*x])^(1 + n)*(1 - (a + b*Tan[e + f*x])/(a - Sqrt[-b
^2]))^((2 + m)/2)*(1 - (a + b*Tan[e + f*x])/(a + Sqrt[-b^2]))^((2 + m)/2))/
(b*f*(1 + n))
```

Rule 133

```
Int[((b_.)*(x_))^(m_)*((c_) + (d_.)*(x_))^(n_)*((e_) + (f_.)*(x_))^(p_), x_
Symbol] :> Simp[(c^n*e^p*(b*x)^(m + 1)*AppellF1[m + 1, -n, -p, m + 2, -((d*
x)/c), -((f*x)/e)])/(b*(m + 1)), x] /; FreeQ[{b, c, d, e, f, m, n, p}, x] &
&  !IntegerQ[m] &&  !IntegerQ[n] && GtQ[c, 0] && (IntegerQ[p] || GtQ[e, 0])
```

Rule 760

```
Int[((d_) + (e_.)*(x_))^(m_)*((a_) + (c_.)*(x_)^2)^(p_), x_Symbol] :> With[
{q = Rt[-(a*c), 2]}, Dist[(a + c*x^2)^p/(e*(1 - (d + e*x)/(d + (e*q)/c))^p*
(1 - (d + e*x)/(d - (e*q)/c))^p), Subst[Int[x^m*Simp[1 - x/(d + (e*q)/c), x
]^p*Simp[1 - x/(d - (e*q)/c), x]^p, x], x, d + e*x], x]] /; FreeQ[{a, c, d,
 e, m, p}, x] && NeQ[c*d^2 + a*e^2, 0] &&  !IntegerQ[p]
```

Rule 3512

```
Int[((d_.)*sec[(e_.) + (f_.)*(x_)])^(m_.)*((a_) + (b_.)*tan[(e_.) + (f_.)*(
x_)])^(n_), x_Symbol] :> Dist[(d^(2*IntPart[m/2])*(d*Sec[e + f*x])^(2*FracP
art[m/2]))/(b*f*(Sec[e + f*x]^2)^FracPart[m/2]), Subst[Int[(a + x)^n*(1 + x
^2/b^2)^(m/2 - 1), x], x, b*Tan[e + f*x]], x] /; FreeQ[{a, b, d, e, f, m, n
}, x] && NeQ[a^2 + b^2, 0] &&  !IntegerQ[m/2]
```

Rule 3515

```
Int[(cos[(e_.) + (f_.)*(x_)]*(d_.))^(m_)*((a_) + (b_.)*tan[(e_.) + (f_.)*(x
_)])^(n_.), x_Symbol] :> Dist[(d*Cos[e + f*x])^m*(d*Sec[e + f*x])^m, Int[(a
 + b*Tan[e + f*x])^n/(d*Sec[e + f*x])^m, x], x] /; FreeQ[{a, b, d, e, f, m,
```

```
n}, x] && !IntegerQ[m]
```

Rubi steps

$$\int (d\cos(e+fx))^m(a+b\tan(e+fx))^n\,dx = \left((d\cos(e+fx))^m(d\sec(e+fx))^m\right)\int (d\sec(e+fx))^{-m}(a+b\tan$$

$$= \frac{\left((d\cos(e+fx))^m\sec^2(e+fx)^{m/2}\right)\text{Subst}\left(\int (a+x)^n\left(1+\frac{x^2}{b^2}\right)^{-1-\frac{n}{2}}\right.}{bf}$$

$$= \frac{\left(\cos^2(e+fx)(d\cos(e+fx))^m\left(1-\frac{a+b\tan(e+fx)}{a-\frac{b^2}{\sqrt{-b^2}}}\right)^{1+\frac{m}{2}}\left(1-\frac{a+b\tan(e-}{a+\frac{b^2}{\sqrt{-b^2}}}\right.\right.}{}$$

$$= \frac{F_1\left(1+n;\frac{2+m}{2},\frac{2+m}{2};2+n;\frac{a+b\tan(e+fx)}{a-\sqrt{-b^2}},\frac{a+b\tan(e+fx)}{a+\sqrt{-b^2}}\right)\cos^2(e+fx)}{}$$

Mathematica [C] time = 23.16, size = 698, normalized size = 3.73

$$\frac{}{f\left(2n(b-a\tan(e+fx))F_1\left(n+1;\frac{m}{2}+1,\frac{m}{2}+1;n+2;\frac{a+b\tan(e+fx)}{a-ib},\frac{a+b\tan(e+fx)}{a+ib}\right)+2(n-m)\tan(e+fx)(a+b\right.}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d*Cos[e + f*x])^m*(a + b*Tan[e + f*x])^n,x]
```

```
[Out] (2*AppellF1[1 + n, 1 + m/2, 1 + m/2, 2 + n, (a + b*Tan[e + f*x])/(a - I*b),
 (a + b*Tan[e + f*x])/(a + I*b)]*(d*Cos[e + f*x])^m*(a + b*Tan[e + f*x])^(1
 + n))/(f*(2*b*AppellF1[1 + n, 1 + m/2, 1 + m/2, 2 + n, (a + b*Tan[e + f*x]
)/(a - I*b), (a + b*Tan[e + f*x])/(a + I*b)]*Sec[e + f*x]^2 + 2*n*AppellF1[
1 + n, 1 + m/2, 1 + m/2, 2 + n, (a + b*Tan[e + f*x])/(a - I*b), (a + b*Tan[
e + f*x])/(a + I*b)]*(b - a*Tan[e + f*x]) + (b*(2 + m)*(1 + n)*((a - I*b)*A
ppellF1[2 + n, 1 + m/2, 2 + m/2, 3 + n, (a + b*Tan[e + f*x])/(a - I*b), (a
+ b*Tan[e + f*x])/(a + I*b)] + (a + I*b)*AppellF1[2 + n, 2 + m/2, 1 + m/2,
3 + n, (a + b*Tan[e + f*x])/(a - I*b), (a + b*Tan[e + f*x])/(a + I*b)])*Sec
[e + f*x]^2*(a + b*Tan[e + f*x]))/((a - I*b)*(a + I*b)*(2 + n)) + 2*(-m + n
)*AppellF1[1 + n, 1 + m/2, 1 + m/2, 2 + n, (a + b*Tan[e + f*x])/(a - I*b),
(a + b*Tan[e + f*x])/(a + I*b)]*Tan[e + f*x]*(a + b*Tan[e + f*x]) + (m*Appe
llF1[1 + n, 1 + m/2, 1 + m/2, 2 + n, (a + b*Tan[e + f*x])/(a - I*b), (a + b
*Tan[e + f*x])/(a + I*b)]*Sec[e + f*x]^2*(a + b*Tan[e + f*x]))/(-I + Tan[e
+ f*x]) + (m*AppellF1[1 + n, 1 + m/2, 1 + m/2, 2 + n, (a + b*Tan[e + f*x])/
(a - I*b), (a + b*Tan[e + f*x])/(a + I*b)]*Sec[e + f*x]^2*(a + b*Tan[e + f*
x]))/(I + Tan[e + f*x])))
```

fricas [F] time = 0.54, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(d\cos\left(fx+e\right)\right)^m\left(b\tan\left(fx+e\right)+a\right)^n,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))^m*(a+b*tan(f*x+e))^n,x, algorithm="fricas")
```

```
[Out] integral((d*cos(f*x + e))^m*(b*tan(f*x + e) + a)^n, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\cos\left(fx+e\right)\right)^m \left(b\tan\left(fx+e\right)+a\right)^n dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))^m*(a+b*tan(f*x+e))^n,x, algorithm="giac")
[Out] integrate((d*cos(f*x + e))^m*(b*tan(f*x + e) + a)^n, x)
```

maple [F] time = 0.82, size = 0, normalized size = 0.00

$$\int \left(d\cos\left(fx+e\right)\right)^m \left(a+b\tan\left(fx+e\right)\right)^n dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*cos(f*x+e))^m*(a+b*tan(f*x+e))^n,x)
[Out] int((d*cos(f*x+e))^m*(a+b*tan(f*x+e))^n,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\cos\left(fx+e\right)\right)^m \left(b\tan\left(fx+e\right)+a\right)^n dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))^m*(a+b*tan(f*x+e))^n,x, algorithm="maxima")
[Out] integrate((d*cos(f*x + e))^m*(b*tan(f*x + e) + a)^n, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int {\left(d\,\cos\left(e+f\,x\right)\right)}^m\,{\left(a+b\,\tan\left(e+f\,x\right)\right)}^n \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*cos(e + f*x))^m*(a + b*tan(e + f*x))^n,x)
[Out] int((d*cos(e + f*x))^m*(a + b*tan(e + f*x))^n, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(d\cos\left(e+fx\right)\right)^m \left(a+b\tan\left(e+fx\right)\right)^n\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*cos(f*x+e))**m*(a+b*tan(f*x+e))**n,x)
[Out] Integral((d*cos(e + f*x))**m*(a + b*tan(e + f*x))**n, x)
```

Chapter 4

Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

4.0.1 Mathematica and Rubi grading function

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)

(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)


(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
(*          GradeAntiderivative[result,optimal] returns*)
(*  "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(*  "C" if result involves higher level functions than necessary*)
(*  "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(*  "A" if result can be considered optimal*)


GradeAntiderivative[result_,optimal_] :=
  If[ExpnType[result]<=ExpnType[optimal],
    If[FreeQ[result,Complex] || Not[FreeQ[optimal,Complex]],
      If[LeafCount[result]<=2*LeafCount[optimal],
        "A",
      "B"],
    "C"],
  If[FreeQ[result,Integrate] && FreeQ[result,Int],
    "C",
  "F"]]


(* ::Text:: *)
(*The following summarizes the type number assigned an *)
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
```

```
(*3 = elementary function*)
(*4 = special function*)
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
(*9 = unknown function*)


ExpnType[expn_] :=
  If[AtomQ[expn],
    1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
        1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
  If[Head[expn]===RootSum,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]]


ElementaryFunctionQ[func_] :=
  MemberQ[{
        Exp,Log,
        Sin,Cos,Tan,Cot,Sec,Csc,
        ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
        Sinh,Cosh,Tanh,Coth,Sech,Csch,
        ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]


SpecialFunctionQ[func_] :=
  MemberQ[{
        Erf, Erfc, Erfi,
        FresnelS, FresnelC,
        ExpIntegralE, ExpIntegralEi, LogIntegral,
        SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
        Gamma, LogGamma, PolyGamma,
        Zeta, PolyLog, ProductLog,
        EllipticF, EllipticE, EllipticPi
},func]


HypergeometricFunctionQ[func_] :=
  MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]
```

```
AppellFunctionQ[func_] :=
  MemberQ[{AppellF1},func]
```

4.0.2 Maple grading function

```
# File: GradeAntiderivative.mpl
# Original version thanks to Albert Rich emailed on 03/21/2017

#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
#Nasser 12/22/2019  Added debug flag, added 'dilog' to special functions
#                   see problem 156, file Apostol_Problems

GradeAntiderivative := proc(result,optimal)
local leaf_count_result, leaf_count_optimal,ExpnType_result,ExpnType_optimal,
   debug:=false;

      leaf_count_result:=leafcount(result);
      #do NOT call ExpnType() if leaf size is too large. Recursion problem
      if leaf_count_result > 500000 then
          return "B";
      fi;

      leaf_count_optimal:=leafcount(optimal);

      ExpnType_result:=ExpnType(result);
      ExpnType_optimal:=ExpnType(optimal);

      if debug then
         print("ExpnType_result",ExpnType_result," ExpnType_optimal=",
   ExpnType_optimal);
      fi;

# If result and optimal are mathematical expressions,
#  GradeAntiderivative[result,optimal] returns
#   "F" if the result fails to integrate an expression that
#       is integrable
#   "C" if result involves higher level functions than necessary
#   "B" if result is more than twice the size of the optimal
#       antiderivative
#   "A" if result can be considered optimal

  #This check below actually is not needed, since I only
  #call this grading only for passed integrals. i.e. I check
  #for "F" before calling this. But no harm of keeping it here.
  #just in case.


  if not type(result,freeof('int')) then
     return "F";
  end if;


  if ExpnType_result<=ExpnType_optimal then
      if debug then
           print("ExpnType_result<=ExpnType_optimal");
      fi;
```

```
      if is_contains_complex(result) then
         if is_contains_complex(optimal) then
            if debug then
               print("both result and optimal complex");
            fi;
            #both result and optimal complex
            if leaf_count_result<=2*leaf_count_optimal then
               return "A";
            else
               return "B";
            end if
         else #result contains complex but optimal is not
            if debug then
               print("result contains complex but optimal is not");
            fi;
            return "C";
         end if
      else # result do not contain complex
           # this assumes optimal do not as well
           if debug then
               print("result do not contain complex, this assumes optimal do
   not as well");
           fi;
           if leaf_count_result<=2*leaf_count_optimal then
              if debug then
                 print("leaf_count_result<=2*leaf_count_optimal");
              fi;
              return "A";
           else
              if debug then
                 print("leaf_count_result>2*leaf_count_optimal");
              fi;
              return "B";
           end if
      end if
  else #ExpnType(result) > ExpnType(optimal)
      if debug then
         print("ExpnType(result) > ExpnType(optimal)");
      fi;
      return "C";
  end if

end proc:

#
# is_contains_complex(result)
# takes expressions and returns true if it contains "I" else false
#
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

# The following summarizes the type number assigned an expression
# based on the functions it involves
# 1 = rational function
# 2 = algebraic function
# 3 = elementary function
# 4 = special function
# 5 = hyperpergeometric function
# 6 = appell function
# 7 = rootsum function
# 8 = integrate function
```

```
# 9 = unknown function

ExpnType := proc(expn)
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
       1
    else
       max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
         1
      else
         max(2,ExpnType(op(1,expn)))
      end if
    else
         max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
  9
  end if
end proc:


ElementaryFunctionQ := proc(func)
  member(func,[
        exp,log,ln,
        sin,cos,tan,cot,sec,csc,
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[
        erf,erfc,erfi,
        FresnelS,FresnelC,
        Ei,Ei,Li,Si,Ci,Shi,Chi,
        GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:
```

```
AppellFunctionQ := proc(func)
  member(func,[AppellF1])
end proc:

# u is a sum or product.  rest(u) returns all but the
# first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
     op(2,u)
  else
     apply(op(0,u),op(2..nops(u),u))
  end if
end proc:

#leafcount(u) returns the number of nodes in u.
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```

4.0.3 Sympy grading function

```
#Dec 24, 2019. Nasser M. Abbasi:
#              Port of original Maple grading function by
#              Albert Rich to use with Sympy/Python
#Dec 27, 2019  Nasser. Added `RootSum`. See problem 177, Timofeev file
#              added 'exp_polar'
from sympy import *

def leaf_count(expr):
    #sympy do not have leaf count function. This is approximation
    return round(1.7*count_ops(expr))

def is_sqrt(expr):
    if isinstance(expr,Pow):
        if expr.args[1] == Rational(1,2):
            return True
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
            asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
            asinh,acosh,atanh,acoth,asech,acsch
        ]

def is_special_function(func):
    return func in [ erf,erfc,erfi,
             fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
             gamma,loggamma,digamma,zeta,polylog,LambertW,
             elliptic_f,elliptic_e,elliptic_pi,exp_polar
         ]

def is_hypergeometric_function(func):
    return func in [hyper]

def is_appell_function(func):
    return func in [appellf1]
```

```
def is_atom(expn):
    try:
        if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
           return True
        else:
           return False

    except AttributeError as error:
        return False

def expnType(expn):
    debug=False
    if debug:
        print("expn=",expn,"type(expn)=",type(expn))

    if is_atom(expn):
       return 1
    elif isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
            return 1
        else:
            return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
    elif isinstance(expn,Pow):   #type(expn,'`^`')
        if isinstance(expn.args[1],Integer):  #type(op(2,expn),'integer')
            return expnType(expn.args[0])   #ExpnType(op(1,expn))
        elif isinstance(expn.args[1],Rational):  #type(op(2,expn),'rational')
            if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
                return 1
            else:
                return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn
   )))
        else:
            return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,
   ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'`+`') or
   type(expn,'`*`')
        m1 = expnType(expn.args[0])
        m2 = expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.func):  #ElementaryFunctionQ(op(0,expn))
        return max(3,expnType(expn.args[0]))  #max(3,ExpnType(op(1,expn)))
    elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(4,m1)   #max(4,apply(max,map(ExpnType,[op(expn)])))
    elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,
   expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(5,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif is_appell_function(expn.func):
        m1 = max(map(expnType, list(expn.args)))
        return max(6,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif isinstance(expn,RootSum):
        m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType
   ,Apply[List,expn]],7]],
        return max(7,m1)
    elif str(expn).find("Integral") != -1:
        m1 = max(map(expnType, list(expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9
```

```
#main function
def grade_antiderivative(result,optimal):

    leaf_count_result  = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if str(result).find("Integral") != -1:
        return "F"

    if expnType_result <= expnType_optimal:
        if result.has(I):
            if optimal.has(I): #both result and optimal complex
                if leaf_count_result <= 2*leaf_count_optimal:
                    return "A"
                else:
                    return "B"
            else: #result contains complex but optimal is not
                return "C"
        else: # result do not contain complex, this assumes optimal do not as
   well
            if leaf_count_result <= 2*leaf_count_optimal:
                return "A"
            else:
                return "B"
    else:
        return "C"
```

4.0.4 SageMath grading function

```
#Dec 24, 2019. Nasser: Ported original Maple grading function by
#               Albert Rich to use with Sagemath. This is used to
#               grade Fricas, Giac and Maxima results.
#Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
#               'arctan2','floor','abs','log_integral'

from sage.all import *
from sage.symbolic.operators import add_vararg, mul_vararg

debug=False;

def tree_size(expr):
    r"""
    Return the tree size of this expression.
    """
    if expr not in SR:
        # deal with lists, tuples, vectors
        return 1 + sum(tree_size(a) for a in expr)
    expr = SR(expr)
    x, aa = expr.operator(), expr.operands()
    if x is None:
        return 1
    else:
        return 1 + sum(tree_size(a) for a in aa)

def is_sqrt(expr):
    if expr.operator() == operator.pow:   #isinstance(expr,Pow):
        if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
            if debug: print ("expr is sqrt")
            return True
```

```
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    debug=False
    m = func.name() in ['exp','log','ln',
            'sin','cos','tan','cot','sec','csc',
            'arcsin','arccos','arctan','arccot','arcsec','arccsc',
            'sinh','cosh','tanh','coth','sech','csch',
            'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
        'arctan2','floor','abs'
        ]
    if debug:
        if m:
            print ("func ", func , " is elementary_function")
        else:
            print ("func ", func , " is NOT elementary_function")


    return m

def is_special_function(func):
    debug=False
    if debug: print ("type(func)=", type(func))

    m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
           'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','
    sinh_integral'
           'Chi','cosh_integral','gamma','log_gamma','psi,zeta',
           'polylog','lambert_w','elliptic_f','elliptic_e',
           'elliptic_pi','exp_integral_e','log_integral']

    if debug:
        print ("m=",m)
        if m:
            print ("func ", func ," is special_function")
        else:
            print ("func ", func ," is NOT special_function")


    return m


def is_hypergeometric_function(func):
    return func.name() in ['hypergeometric','hypergeometric_M','
    hypergeometric_U']

def is_appell_function(func):
    return func.name() in ['hypergeometric']   #[appellf1] can't find this in
    sagemath

def is_atom(expn):

    debug=False
    if debug: print ("Enter is_atom")


    #thanks to answer at https://ask.sagemath.org/question/49179/what-is-
    sagemath-equivalent-to-atomic-type-in-maple/
    try:
        if expn.parent() is SR:
```

```
            return expn.operator() is None
        if expn.parent() in (ZZ, QQ, AA, QQbar):
            return expn in expn.parent() # Should always return True
        if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens")
    :
            return expn in expn.parent().base_ring() or expn in expn.parent().
    gens()
        return False

    except AttributeError as error:
        return False


def expnType(expn):

    if debug:
        print (">>>>>Enter expnType, expn=", expn)
        print (">>>>>is_atom(expn)=", is_atom(expn))

    if is_atom(expn):
        return 1
    elif type(expn)==list:   #isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if  type(expn.operands()[0])==Rational: #type(isinstance(expn.args[0],
    Rational):
            return 1
        else:
            return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.
    args[0]))
    elif expn.operator() == operator.pow:   #isinstance(expn,Pow)
        if type(expn.operands()[1])==Integer:  #isinstance(expn.args[1],Integer
    )
            return expnType(expn.operands()[0])   #expnType(expn.args[0])
        elif type(expn.operands()[1])==Rational:  #isinstance(expn.args[1],
    Rational)
            if type(expn.operands()[0])==Rational: #isinstance(expn.args[0],
    Rational)
                return 1
            else:
                return max(2,expnType(expn.operands()[0]))  #max(2,expnType(
    expn.args[0]))
        else:
            return max(3,expnType(expn.operands()[0]),expnType(expn.operands()
    [1])) #max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1]))
    elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #
    isinstance(expn,Add) or isinstance(expn,Mul)
        m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
        m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.operator()):  #is_elementary_function(expn
    .func)
        return max(3,expnType(expn.operands()[0]))
    elif is_special_function(expn.operator()): #is_special_function(expn.func)
        m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(
    expn.args)))
        return max(4,m1)   #max(4,m1)
    elif is_hypergeometric_function(expn.operator()): #
    is_hypergeometric_function(expn.func)
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(
    expn.args)))
        return max(5,m1)   #max(5,m1)
    elif is_appell_function(expn.operator()):
```

```
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(
    expn.args)))
        return max(6,m1)   #max(6,m1)
    elif str(expn).find("Integral") != -1: #this will never happen, since it
                #is checked before calling the grading function that is passed.
                #but kept it here.
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(
    expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):

    if debug: print ("Enter grade_antiderivative for sagemath")

    leaf_count_result  = tree_size(result) #leaf_count(result)
    leaf_count_optimal = tree_size(optimal) #leaf_count(optimal)

    if debug: print ("leaf_count_result=", leaf_count_result, "
    leaf_count_optimal=",leaf_count_optimal)


    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if debug: print ("expnType_result=", expnType_result, "expnType_optimal=",
    expnType_optimal)

    if expnType_result <= expnType_optimal:
        if result.has(I):
            if optimal.has(I): #both result and optimal complex
                if leaf_count_result <= 2*leaf_count_optimal:
                    return "A"
                else:
                    return "B"
            else: #result contains complex but optimal is not
                return "C"
        else: # result do not contain complex, this assumes optimal do not as
    well
            if leaf_count_result <= 2*leaf_count_optimal:
                return "A"
            else:
                return "B"
    else:
        return "C"
```